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NOTARY VIJAYKUMAR S. SHINDE Area: Vadodara (Gujarat State) Expiry Date 02-02-2030 Reg. No. 18042 Govt. OF INDIA

BEFORE THE NATIONAL GREEN TRIBUNAL,
WESTERN ZONAL BENCH AT PUNE

ORIGINAL APPLICATION NO. 02 OF 2025

IN THE MATTER OF:

ASHUTOSH KUMAR .... APPLICANT

VERSUS

GUJARAT FLUOROCHEMICALS LIMITED & OTHERS .... RESPONDENTS

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Vanita Bhargava

(VANITA BHARGAVA)
D/527/1998(R)
KHAITAN & CO
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Place: New Delhi
Dated: 07/06/2025

BEFORE THE NATIONAL GREEN TRIBUNAL,
WESTERN ZONAL BENCH AT PUNE

ORIGINAL APPLICATION NO. 2 OF 2025

IN THE MATTER OF:

ASHUTOSH KUMAR **....APPLICANT**

VERSUS

Regd. No.: 5103
Date: 06 / 06 /2025

GUJARAT FLUOROCHEMICALS LIMITED & OTHERS **....RESPONDENTS**

REPLY AFFIDAVIT ON BEHALF OF RESPONDENT NO. 1 TO O.A. NO. 2 OF 2025

I, Sanath Kumar Muppirala, aged about 62 years, working for gain at Gujarat Fluorochemicals Limited, the Respondent No. 1 herein, do hereby solemnly affirm and state as hereunder: -

1. That I am the director and authorized signatory of the Respondent No. 1 company **("Answering Respondent")** which has been arrayed in the above-mentioned matter and I am well aware of the facts and circumstances of the case. I am therefore competent and authorized to affirm the present Reply Affidavit on behalf of the Answering Respondent.

2. That I have read and understood the contents of the aforementioned Original Application filed by the Applicant and I am therefore competent to reply to the same. The Answering Respondent denies

NOTARY VIJAYKUMAR S. SHINDE Reg. No. 18042 Govt. OF INDIA

all averments made in the Original Application that are contrary to what has been stated in the present Reply Affidavit.

3. That the present OA has been filed by the Applicant seeking directions for conducting an inquiry into the unfortunate gas leak accident which occurred on 28 December 2024 at the Chloromethane plant of the Answering Respondent. It has also been prayed that the Answering Respondent may be directed to pay compensation to the families of the deceased and also for the damage caused to the environment due to the gas leak.

4. That at the outset it is submitted that the Answering Respondent is deeply saddened with the occurrence of the accident. It is submitted that Gujarat Pollution Control Board had already conducted an inspection on 29 December 2024 after the incident and issued a direction under Section 31-A of the Air (Prevention and Control of Pollution) Act, 1981 on 3 January 2025 and had directed the Answering Respondent to take all necessary measures for safety of the environment and to carry out safety audit to study the root cause analysis for the accident. An interim environment compensation of Rs 1,00,00,000 was also imposed and closure directions were also issued.

NOTARY VIJAYKUMAR S. SHINDE Area: Vadodara (Gujarat State) Expiry Date 02-02-2030 Reg. No. 18042 Govt. OF INDIA

Thereafter the answering Respondent submitted an undertaking dated 10 January 2025 that it has complied with all the directions and inter alia found that:

(a) The unit had replaced the isolation valve where gas leakage incident occurred. The damaged valve had been replaced

(b) There were no gas leakages observed

(c) The unit was in compliance with and further undertook to implement all recommendations of HAZOP study carried out by M/s HSE Risk management services Pvt Ltd.

(d) It was also recorded that interim environment compensation has been paid and accordingly the closure direction was revoked for 3 months.

The Director of industrial Safety and Health **(DISH)** had also issued a prohibitory order. That the Answering respondent vide its letter dated 8 January 2025 addressed to DISH also submitted its compliance to the observations made by DISH. After being satisfied with the same the closure direction issued by DISH was revoked on 13 January 2025.

5. That the Answering Respondent has also separately deposited compensation of Rs. 49,78,025/- with the Commissioner for Workmen Compensation, Labour Court, Bharuch for all four deceased workmen. Answering Respondent shall abide by all appropriate orders/ directions of the Labour court- Bharuch including payment of any appropriate additional compensation as may be directed for the benefit of the legal heirs of each deceased workmen in accordance with the law.

6. That in light of the above, at the outset it is submitted that the OA has worked itself out and accordingly the same may be disposed off.

7. That the Answering Respondent is a part of the INOXGFL group and is a well-established chemical company with over 37 years of expertise in fluorine chemistry. It is a leading producer of Fluoropolymers, Fluorospecialities, Refrigerants and Chemicals for applications in varied industries. The manufacturing unit of the

and implemented comprehensive steps to prevent any recurrence of such unfortunate events.

11. That it is submitted that the concerned manufacturing facility of the Answering Respondent is operated strictly in compliance of the various applicable Acts, Rules, Regulations and Directions of the government. That the answering Respondent has all the requisite permissions. It has a valid license dated 30 January 2007 to operate a factory which is valid till 31 December 2025. It has valid permissions from Chief Controller of Explosives, PESO to import and store various gases. It has also empanelled a hospital for the safety of its workmen. It has a valid consent to operate and permissions under the Hazardous Waste Management Rules, 2016. The Answering Respondent is also compliant with the conditions of EC and CCA. Copies of the various valid permissions under which the answering Respondent is operating along with the compliance reports submitted by the answering Respondent are annexed hereto and marked as **ANNEXURE R1/1 (COLLY)**.

12. That it is submitted that a safety audit of the manufacturing facility of the Answering Respondent at Dahej is conducted by a competent third party every year whereby all the safety measures and precautions provided by the Answering Respondent with respect to all the different types of raw materials used for production are thoroughly inspected. Further the Answering Respondent complies with the recommendations provided in the safety audit report.

13. That in the case Yashyashvi Rasayan Limited this Hon'ble Tribunal vide order dated 8 June 2020 in OA 22 of 2020 **[Pg 44 of OA]** had

Answering Respondent in Dahej, Gujarat which is the subject matter of the present Original Application **("OA")** started its operations in 2007 and is presently the Largest Fluoropolymer Plant in India. The Answering Respondent directly employs around 1860 personnels and has created an indirect employment for over 2111 personnels in the manufacturing unit which is helping the local economy.

8. That the Answering Respondent is an ISO 9001:2015 [Quality management systems], ISO 14001:2015 [Environmental management systems], ISO 45001:2018 [Occupational health and safety management systems] and SA 8000:2014 [Social Accountability management systems] certified organization which rigorously upholds safety standards across all its facilities.

9. That the Answering Respondent operates its manufacturing facility with all the requisite permits and sanctions such as from the Petroleum and Explosives Safety Organization (PESO), Ministry of Ministry of Environment, Forest and Climate Change (MoEFCC) and the Gujarat Pollution Control Board (GPCB) etc and is complying with all the applicable Acts, Rules, Regulations, Directions etc. of the regulatory authorities. All the relevant regulatory authorities continuously conduct surveys and inspections of the premises of the Answering Respondent to ensure that the Answering Respondent is complying with all the applicable rules and regulations.

10. That the Answering Respondent aims to undertake all necessary measures to safeguard the well-being of its employees and the surrounding areas, and the present incident was an unfortunate anomaly. The Answering Respondent has exercised all due diligence

laid down certain directions to mitigate risk in industries dealing with hazardous chemicals namely:

(a) Companies to carry out risk studies

(b) Prepare onsite and off-site plan which are operational

(c) Carry out a mock drill

14. The answering Respondent had complied with the aforesaid directions as under:

(a) The safety audit is conducted as per IS 14489:2018 which is the Indian Standard for "Occupational Health and Safety Audit — Code of Practice". The safety audit reports for July 2023 and December 2024 are annexed hereto and marked as **ANNEXURE-R1/2**.

(b) Further, the Answering Respondent has an on-site Emergency response plan which was prepared in April 2023 and further revised on 30 May 2023 which has been prepared in accordance with guidelines given in various safety legislations such as the Gujarat Factories Rule 1963, Manufacture, Storage and Import of Hazardous Chemicals Rules 1989 and the Atomic Energy (Radiation Protection) Rules 2004. A copy of the on-site Emergency response plan which was prepared in April 2023 and further revised on 30 May 2023 is annexed hereto and marked as **ANNEXURE-R1/3**.

(c) A safety report as required under MSIHC Rules, 1989 was also prepared, a copy of which is annexed hereto and marked as **ANNEXURE R1/4** and we are strictly complying the same including conducting bimonthly mock drills.

15. That on 28 December 2024, around 20:00 hrs., there was a gas leak from one section of Chloromethane plant ("CMS-1 plant") of the Answering Respondent. There was a leakage of Crude Chloro Methane Substance (CMS) which contains a mixture of Chloroform, Methylene Dichloride and Carbon Tetrachloride.

16. That the concerned section was immediately isolated and the steps as prescribed under the On-Site Emergency Plan were followed. However, during the course of gas leak a few persons in the vicinity of the leak in the direction of the wind got affected. When these persons reported to our Occupation Health Centre (OHC), they were stable and complaining about throat irritation and primary treatment was administered; while four of them who complained about nausea were immediately referred to Dahej hospital and later to Bharuch hospital for further treatment. Unfortunately, they succumbed to death due to subsequent complications. Their details are as under:

Sr. No.	Name	Age	Employment
1.	Mr. Rajesh S Magnadia	47 yrs	Company Employee
2.	Mr. Suchil Kumar	38 yrs	Contract Employee
3.	Mr. Mahesh	25 yrs	Contract Employee
4.	Mr. Mundrika Yadav	29 yrs	Contract Employee

Two other workers suffered injuries due to the accident and their details are as below.

Sr. No.	Name	Age	Injuries
1.	Mr. Chhelbihari Sahu	31yrs	Lost work case
2.	Mr. Surya Lal Sahu	44yrs	Lost work case

Answering Respondent further submits that no outsider was affected due to the gas leak.

17. That it is submitted that following the unfortunate incident, the Gujarat Pollution Control Board, Respondent No. 3, vide a letter dated 03 January 2025 directed that the unit shall not use/operate CMS-1 plant before obtaining a revocation from the board. It further issued certain other directions which are as follows: -

(i) To take all necessary measures to safely remove all remaining in-process material/ intermediate materials considering requisite process safety aspects.

(ii) To ensure safe collection of residues of chemicals / hazardous & other wastes generated from accident and dispose the same as per provisions of the Hazardous Waste Management Rules, 2016 under intimation to the Board.

(iii) To take all necessary measures to ensure safety of all reactors, equipment etc. to prevent further mishappening and environmental damage.

(iv) To carry out safety audit/ HAZOP study and root cause analysis for accident that shall include environment aspects at the earliest and submit the same to the Board.

(v) To submit compliance report of the instructions/directions issued by DISH w.r.t. accident, if any.

(vi) Unit shall pay Rs. 1 Crore (Rupees One Crore only) as Interim Environment Damage Compensation (EDC)immediately through XGN portal.

(vii) To submit Bank guarantee of Rs. 10 Lac (Rupees ten lac only) for compliance assurance at the time of revocation.

The closure letter dated 03 January 2025 is annexed hereto and marked as **ANNEXURE-R1/5**.

18. That the Answering Respondent complied with all the directions and the Respondent No. 3, after conducting an inspection of the industry and after being satisfied that the Answering Respondent was complying with all the directions issued a letter dated 17 January 2025 for revocation of the closure order subject to the condition that the Answering Respondent shall comply with the conditions of the Consolidated Consent & Authorization ("CCA"). The letter dated 17 January 2025 is annexed hereto and marked as **ANNEXURE-R1/6**.

19. That the Answering Respondent has deposited the claim amount in respect of the deceased workmen with the Commissioner for Workmen Compensation, Labour Court, Bharuch as mentioned in para 5 above. In addition to the compensation deposited with the Commissioner for Workmen Compensation the Answering Respondent has also paid an Ex-Gracia compensation of Rs. 40,00,000/- (Rupees Forty Lakhs) to family members/dependents of the deceased persons. Additionally, the Answering Respondent has assured and offered the Mr. Kush Rajeshkumar Magnadia (son of deceased Mr. Rajesh S Magnadia), a) reimbursement of education fees for the remainder of tenure of education, b) transportation charges/expenses (paid monthly) towards commuting to Parul

University Vadodara for remaining years of college, c) suitable job with the Answering Respondent.

The proof of payment made with respect to the deceased workers (including proof of the ex-gratia compensation paid and letter offering benefits to Mr. Kush Rajeshkumar Magnadia) is annexed hereto and marked as **ANNEXURE-R1/7 (COLLY)**.

20. That the Answering Respondent has also made a payment of Rs. 1,00,00,000/- (Rupees One Crore) as interim Environmental Compensation in compliance of the directions of the GPCB. Copy of the receipt of payment of interim Environment Compensation is annexed hereto and marked as **ANNEXURE -R1/8**

21. It is further submitted that the preliminary investigation carried out revealed that the primary reason for the gas leak was failure of the valve due to the dislodging of the bonnet due to valve bonnet-bolts failure, which occurred due to metallurgical failure of the bolt material. The said failure was accidental as the instruction manual supplied by the manufacturer of the valve states that the regular maintenance work is not required at fittings of the valve. That it is further submitted that the Answering Respondent immediately after the accident removed the damaged valve connected pipeline after carrying out proper decontamination and the same was approved by an independent agency approved by the Director, Industry Safety and Health (DISH). The work was carried out with great care by an expert agency after ensuring that there was no residual gas in the system before commencement of the work. All the working personnel were provided with all the safety equipment and PPE kits

and the work was carried out with the proper work permit system. There is no negligence attributable to the Answering Respondent.

22. That the Answering Respondent had availed the services of a DISH approved agency for carrying out the inspection, testing and certification of the equipment used in the factory that may cause emergency and the same were approved by the competent agency. Further, hydrostatic testing and gamma scanning of the pressure vessels and associated plant equipment's has been carried out by the DISH-approved agency, which verified that the equipment meet required safety standards. The results of the tests were documented and certified, confirming the safety and operational readiness of the equipment.

23. The Answering Respondent immediately implemented a Mechanical Integrity and Quality Assurance (MIQA) program to ensure the integrity of the safety of the plant which was completed by and under the guidance of expert and certified agencies and all the reports were supplied to the authorities.That the Answering Respondent also conducted safety training of its employees from a training institute approved by the Chief Inspector under the Factories Act, 1948. The Answering respondent had vide its letter dated 8 January 2025 informed compliance with the directions of DISH. Copy of letter dated 8 January 2025 is annexed hereto and marked as **ANNEXURE R1/9**.

The closure direction issued by DISH was revoked on 13 January 2025.

24. A refresher training for our workforce has also been undertaken. Continuous in-house assessments and stricter supervision for

compliance of Safety Standard Operating Procedures is being assured by the shift supervisors and the workers are being continuously sensitized in this regard.

25. That it is submitted that the manufacturing facility of the Answering Respondent is being operated strictly in compliance with the applicable Acts, Rules, Regulations and Directions of the government and under the strict and constant supervision of the regulatory authorities. That the Answering Respondent has deposited the claim amount in respect of the deceased workmen with the Commissioner for Workmen Compensation, Labour Court, Bharuch calculated as per the provisions of the Workmen's Compensation Act 1923 and is ready and willing to pay balance amount, if any determined by the Labour Court.

26. The Answering Respondent in addition to the above compliances, had also immediately after the unfortunate incident paid ex-gratia compensation to the families of the deceased workers as detailed in para 19 above.

27. That the Answering Respondent is continuously striving to make its premises a safe workplace for all its workers and is extremely regretful of the unfortunate incident.

28. That the regulatory authorities have undertaken detailed and thorough inspection of the manufacturing plant of the Answering Respondent and only after confirmation that all safety measures have been taken by the Answering Respondent have allowed it to re-start its manufacturing operations.

29. That the Answering Respondent is a socially responsible corporate entity and a conscientious member of the community and is fully

aware of its obligations towards the environment and the community. It actively engages in practices that promote environmental conservation and sustainable development as well as the members of the community. It provides livelihood directly and indirectly to around 3971 workmen and also contributes to the exchequer.

30. Without prejudice, the Answering Respondent states that the unfortunate gas leak incident which occurred on 28 December 2024 has not resulted in any environmental damage. The Answering Respondent has compensated the families of deceased persons affected due to the unfortunate incident. The Answering Respondent immediately implemented and followed the safety protocols as required by law and ensured that the no damage is caused to the environment. That the failure of valve was purely an unfortunate and unforeseen accidental event.

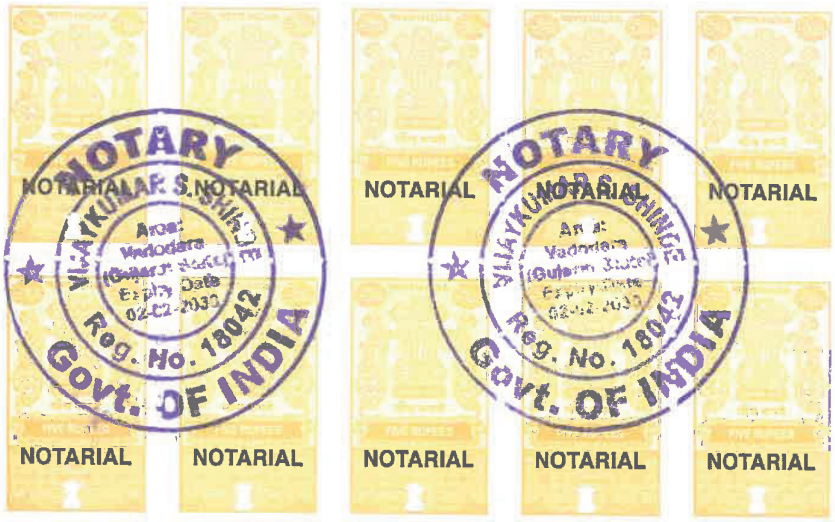
31. In view of the above facts and circumstances, since the Answering respondent has paid the interim environment compensation, compensation to workmen and has taken steps to remedy the cause of the incident and taken remedial measures to protect the environment, it is humbly prayed that the present Original Application may be disposed off.

NOTARY VIJAYKUMAR S. SHINDE Area: Vadodara Reg. No. 13042 Govt. OF INDIA

GUJARAT FLUOROCHEMICALS LIMITED VADODARA

DEPONENT

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NOTARIAL
NOTARY
VIJAYKUMAR S. SHINDE
Area: Vadodara (Gujarat State)
Expiry Date 02-02-2033
Reg. No. 18042
Govt. OF INDIA

VERIFICATION

I, the deponent above named do hereby verify that the contents of the foregoing affidavit are true and correct to my knowledge, no part of it is false and nothing material has been concealed therefrom.

Verified at Vadodara on this 6th day of June, 2025.

GUJARAT FLUOROCHEMICALS LIMITED VADODARA

Sanè Kumar M

DEPONENT

NOTARY VIJAYKUMAR S. SHINDE Area: Vadodara Reg. No. 18042 Govt. OF INDIA

Solemnly Affirmed/Declared Sworn Before me by Sanat Kumar Muppirala

V S Shinde

VIJAY S. SHINDE
NOTARY (Govt. of India)

06 JUN 2025

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ANNEXURE-R1/1

भारत सरकार/Government of India
वाणिज्य और उद्योग मंत्रालय/Ministry of Commerce & Industry
पेट्रोलियम तथा विस्फोटक सुरक्षा संगठन (पैसो) /Petroleum & Explosives Safety Organisation (PESO)
9वीं मंजिल, पार्क पैराडाइज, वडसर
वडोदरा- 390012
9th Floor, Park Paradise, Vadsar,
Vadodara - 390012

ई-मेल:/E-mail :
jtcce.vadodara@explosives.gov.in
फोन / फ़ैक्स नंबर:/Phone/Fax No : 0265 - 2361035

अनुज्ञप्ति सं./No : S/HO/GJ/03/2054(S93764) दिनांक/Dated : 22/08/2023

सेवा में/To,

M/s. GUJRAT FLUOROCHEMICALS LIMITED,
12/A, GIDC DAHEJ INDUSTRIAL ESTATE, TAL. VAGRA, BH,
VAGRA,
Bharuch,
Taluka: Vagra,
District: BHARUCH,
State: Gujarat
PIN: 440015

विषय :/Sub : Plot No, 12/A,, GIDC DAHEJ INDUSTRIAL ESTATE, BHARUCH, Vagra, Taluka: Bharuch, District: BHARUCH, State: Gujarat, PIN: 392130 स्थित R 142b, गैस के संपीडित पात्र / पात्रों में भंडारण के लिए स्थिर एवं गतिशील दाब पात्र (अज्वलित) नियम, 2016 के अधीन स्वीकृत अनुज्ञप्ति संख्या S/HO/GJ/03/2054 के नवीनीकरण संबंध में /Storage of NR 142b gas in pressure vessels at Plot No, 12/A,, GIDC DAHEJ INDUSTRIAL ESTATE, BHARUCH, Vagra, Taluka: Bharuch, District: BHARUCH, State: Gujarat, PIN: 392130 - Licence No : S/HO/GJ/03/2054 grant in form LS-1A of SMPV(U) Rules, 2016-Renewal of Licence Regarding

महोदय/Sir(s),

कृपया आपके दिनांक : 18/08/2023 के पत्र संख्या: **OIN1414174** का संदर्भ ग्रहण करें I/Please refer to your application No.**OIN1414174** dated 18/08/2023 .

अनुज्ञप्ति संख्या : **S/HO/GJ/03/2054** का नवीकरण दिनांक 30th सितंबर 2028 तक कर इसके साथ अग्रेषित की जा रही हैं । Licence Number: **S/HO/GJ/03/2054** is renewed and is valid upto **30th September 2028** is forwarded herwith.

दिनांक 30/09/**2028** . से आगे अनुज्ञप्ति नवीनीकरण हेतु उपरोक्त नियम के नियम 55 के प्रावधानों का पालन किया जाएं । विलंब शुल्क से बचने हेतु शुल्क के साथ मूल अनुज्ञप्ति तथा अन्य दस्तावेज अधिकतम दिनांक : 30 सितंबर, **2028** तक **The Jt. Chief Controller of Explosives, Vadodara Circle, Vadodara** में जरूर पहुंच जाने चाहिए ।
The provisions of the Rule 55 of the above said rules shall be followed for further renewal of the licence beyond 30/9/**2028**. The renewal application along with fees, Original licence and other documents shall reach in the Office of **The Jt. Chief Controller of Explosives, Vadodara Circle, Vadodara**, latest by 30th September,**2028** to avoid late fee.

कृपया अनुज्ञप्ति प्राप्ति की पावती दें I/Please acknowledge the receipt of the licence.

भवदीय/Yours faithfully,

((आर.वेणुगोपाल)
(Dr. R.Venugopal))
संयुक्त मुख्य विस्फोटक नियंत्रक
Jt. Chief Controller of Explosives
वडोदरा/Vadodara

संयुक्त मुख्य विस्फोटक नियंत्रक, वडोदरा
Joint Chief Controller of Explosives,Vadodara

(अधिक जानकारी जैसे आवेदन की स्थिति, शुल्क तथा अन्य विवरण के लिए हमारी वेबसाइट : http://peso.gov.in देखें)
(For more information regarding status,fees and other details please visit our website http://peso.gov.in)

Note:-This is system generated document does not require signature.

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FORM LS-1A/प्ररुप - एलएस–1क
(See Rules 50, 51, 54 and 55)/(नियम 50 , 51, 54 और 55 देखें)
Licence to Store Compressed gas in pressure vessel or vessels
दाब पात्र या पात्रों में संपीड़ित गैस भण्डारकरण के लिए अनुज्ञप्ति

अनुज्ञप्ति सं/Licence No. : **S/HO/GJ/03/2054(S93764)** फीस रुपए/Fee Rs. **50000/-** per year/प्रति वर्ष

Licence is hereby granted to GUJRAT FLUOROCHEMICALS LIMITED, 12/A, GIDC DAHEJ INDUSTRIAL ESTATE, TAL. VAGRA, BH ,VAGRA,Bharuch, Taluka: Vagra, District: BHARUCH , State: Gujarat PIN: 440015 valid only for the storage of compressed gas in 1 Number(s) of pressure vessels as indicated below in the licensed premises described below and shown in the plan No.S/HO/GJ/03/2054(S93764) dated 22/08/2023 subject to the provisions of the Indian Explosives Act, 1884 (4 of 1884) and the rules made thereunder and to the further conditions of this licence.

श्री GUJRAT FLUOROCHEMICALS LIMITED, 12/A, GIDC DAHEJ INDUSTRIAL ESTATE, TAL. VAGRA, BH ,VAGRA,Bharuch, Taluka: Vagra, District: BHARUCH , State: Gujarat PIN: 440015 को नीचे वर्णित अनुज्ञप्त परिसरों में और रेखांकन संख्या S/HO/GJ/03/2054(S93764) dated 22/08/2023 में भारतीय विस्फोटक अधिनियम, 1884 (1884 का 4) और उसके अधीन बनाए गए नियमों तथा इस अनुज्ञप्ति की अन्य शर्तों पर 1 दाब पात्र / पात्रों में संपीड़ित गैस के भण्डारण के लिए अनुज्ञप्ति मंजूर की जाती है।

यह अनुज्ञप्ति 30 सितंबर 2028 तक प्रवृत्त रहेगी।
The Licence shall remain in force till the **30th September2028.**

Vessel No./वेसल नंबर	Name of Gas/ गैस का नाम	State of Gas/ गैस की स्थिति	Water Capacity in cubic meter/ जल क्षमता (घ.मी.)	Max. working Pre.(kg/cm^2)/ अधिकतम वर्किंग प्रेशर	Quantity Granted in kgs(Liquified gas)/किलोग्रॅम में जारी मात्रा (लिक्विफाईड गैसेस)
26V0101B	R 142b	Liquified	39.50	4.5	42516
Total Water capacity			**39.50**		

July 1, 2021

For Chief Controller of Explosives
HQ, Nagpur
कृते मुख्य विस्फोटक नियंत्रक
नागपुर

DESCRIPTION AND LOCATION OF THE LICENSED PREMISES/अनुज्ञप्त परिसर का विवरण और अवस्थिती

The licensed premises, the layout boundaries and other particulars of which are shown in the attached approved plan No. S/HO/GJ/03/2054 dated 22/08/2023 are situated at VagraBHARUCH and consists of 1 Number(s) vessel(s) for storage of :/ अनुज्ञप्त परिसर, प्रदर्शित सीमा और अन्य विवरण जो संलग्न अनुमोदित रेखाचित्र क्र.S/HO/GJ/03/2054 दिनांक 22/08/2023 में दर्शाए गए है VagraBHARUCH पर स्थित है और इसमे 1 वेसल सम्मिलित है।

a) Flammable/Corrosive/Toxic Gases :/ज्वलनशील / संक्षारक / विषैली गैसों:

b) Non-Toxic Gases :/अविषैली गैसों : R 142b

and is situated at PlotNo : 12/A, , Village/Town : VagraBHARUCH, Police Station : BHARUCH, District : BHARUCH, State : Gujarat , Pin : 392130.
/प्लाट संख्या PlotNo : 12/A, , गांव या नगर : VagraBHARUCH, पुलीस थाना : BHARUCH, जिला : BHARUCH, राज्य : Gujarat , Pin : 392130 में स्थित है।

SPACE FOR ENDORSEMENT OF RENEWALS/नवीकरण के पृष्ठांकन के लिए स्थान

	Date of Renewal/ नवीकरण की तारीख	Date of Expiry/ अनुज्ञप्ति की समाप्ति की तारीख	Signature and stamp of the licensing authority/अनुज्ञापन प्राधिकारी के हस्ताक्षर और कार्यालय की मुद्रा
This licence shall be renewable without any concession in fee for three years in the absence of			

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contravention of the provision of the Indian Explosives Act, 1884, or the Static and Mobile Pressure Vessles (Unfired) Rules,2016, framed thereunder or of the conditions of the licence./अनुज्ञप्ति, भारतीय विस्फोटक अधिनियम, 1884 या उसके अधीन अधीन बनाए गए स्थिर एवं गतिशील दाब पात्र (अज्वलित) नियम, 2016 या इस अनुज्ञप्ति की शर्तों का उल्लंघन न होने की दशा में, फीस में बिना किसी छूट के तीन वर्ष तक नवीकृत की जाएगी।	22/08/2023	30/09/2028	Dr. R.Venugopal JCCE For, Jt. Chief Controller of Explosives Vadodara संयुक्त मुख्य विस्फोटक नियंत्रक, वडोदरा Joint Chief Controller of Explosives,Vadodara

This licence is liable to be cancelled if the licenced premises are not found conforming to the description and conditions attached hereto and contravention of any of the rules and conditions under which this licence is granted and the holder of this licence is also punishable with imprisonment for the term which may extend to two years or with fine which may extend to three thousand rupees or with both./यदि निरीक्षण के समय अनुज्ञप्त परिसर इससे उपाबद्ध विवरण और शर्तों के अनुरुप नहीं पाया जाता है और जिन नियमों और शर्तों के अधीन यह अनुज्ञप्ति मंजूर की गई है, उनमे से किसी का उल्लंघन होता है तो उस दशा में यह अनुज्ञप्ति रद्द की जा सकती है और अनुज्ञप्ति का धारक कारावास से, जिसकी अवधि दो वर्ष तक की हो सकेगी, या जुर्माने से, जो तीन हजार रुपये तक का हो सकेगा, या दोनों से दण्डनीय भी होगा।

Note:-This is system generated document does not require physical signature.

भारत सरकार
Government of India
वाणिज्य और उद्योग मंत्रालय
Ministry of Commerce & Industry
पेट्रोलियम तथा विस्फोटक सुरक्षा संगठन (पैसो)
Petroleum & Explosives Safety Organisation (PESO)
आंठवी मंजिल, यश कमल बिल्डींग, सयाजी गंज
वडोदरा- 390020
8th Floor, Yash Kamal Building, Sayajigunj,
Vadodara - 390020

E-mail : dyccebaroda@explosives.gov.in
Phone/Fax No : 0265 - 2225159

संख्या /No. : P/HQ/GJ/15/4798 (P184279)

दिनांक /Dated : 14/10/2015

सेवा में /To,

M/s Gujarat Fluorochemicals Limited,
12/A,GIDC Dahej Industrial Estate,,
Tal-Vagra,
Bharuch,
District: BHARUCH,
State: Gujarat
PIN: 392130

17 OCT 2015

विषय /Sub : Plot No, NA, Plot No. 13, GIDC Estate Area,, Dahej,, District: BHARUCH, State: Gujarat, PIN: 999999 में स्थित विद्यमान पेट्रोलियम वर्ग A अधिष्ठापन में अनुज्ञप्ति सं P/HQ/GJ/15/4798 (P184279) के नवीकरण के संदर्भ में ।
Existing Petroleum Class A Installation at Plot No, NA, Plot No. 13, GIDC Estate Area,, Dahej,, District: BHARUCH, State: Gujarat, PIN: 999999 - Licence No. P/HQ/GJ/15/4798 (P184279) - Renewal regarding.

महोदय /Sir (s),

कृपया आपके पत्र क्रमांक GFL/Da/EP/CCOE/Methanol/2015/5 दिनांक 17/09/2015 का अवलोकन करें ।
Please refer to your letter No.: GFL/Da/EP/CCOE/Methanol/2015/5, dated 17/09/2015

अनुज्ञप्ति संख्या P/HQ/GJ/15/4798 (P184279) दिनांक 06/06/2011 को दिनांक 31/12/2025 तक नवीनीकृत कर इस पत्र के साथ अग्रेषित की जा रही है ।
Licence No. P/HQ/GJ/15/4798 (P184279) dated 06/06/2011 is forwarded herewith duly renewed upto 31/12/2025.

कृपया पेट्रोलियम नियम 2002 के अधीन बनाए गए नियम 148 में दी गई प्रक्रिया का कडाई से पालन करें । अनुज्ञप्ति के नवीकरण हेतु समस्त दस्तावेजों को अनुज्ञप्ति की वैधता समाप्त होने की तिथि से कम से कम 30 दिन पूर्व कार्यालय को प्रेषित करें ।
Please follow the procedure strictly as laid down in rule 148 of the Petroleum Rules, 2002 and submit complete documents for the Renewal of the licence so as to reach this office on or before the date on which Licence expires.

कृपया पावती दें।
Please acknowledge the receipt.

भवदीय /Yours faithfully,

(विनोद कुमार)
(VINOD KUMAR)
उप मुख्य विस्फोटक नियंत्रक
Dy. Chief Controller of Explosives
वडोदरा
Vadodara

(अधिक जानकारी जैसे आवेदन की स्थिति, शुल्क तथा अन्य विवरण के लिए हमारी वेबसाइट : http://peso.gov.in देखें)
(For more information regarding status,fees and other details please visit our website: http://peso.gov.in)

भारत सरकार
Government of India
वाणिज्य और उद्योग मंत्रालय
Ministry of Commerce & Industry
पेट्रोलियम तथा विस्फोटक सुरक्षा संगठन (पैसो)
Petroleum & Explosives Safety Organisation (PESO)
पूर्व नाम- विस्फोटक विभाग
Formerly Department of Explosives
पाँचवा तल, ए-ब्लाक, सी जी ओ कॉम्प्लेक्स, सेमिनरी हिल्स
5th Floor, A-Block, CGO Complex,, Seminary Hills,
नागपूर (Nagpur (M.S.)) - 440006

ई-मेल (E-mail): explosives@explosives.gov.in
फ़ोन / फैक्स (Phone / Fax): 2510248 / 2510577

संख्या (No.): **P/HQ/GJ/15/4798(P184279)**

तारीख (Date): 6/6/2011

सेवा में (To),

M/s Gujarat Fluorochemicals Limited
12/A,GIDC Dahej Industrial Estate,, Tal-Vagra,
Bharuch, District - BHARUCH , PIN - 392130
State : Gujarat

विषय - Plot No 13, GIDC Estate Area,,Dahej, जिल्हा BHARUCH राज्य Gujarat मे विद्यमान पेट्रोलियम वर्ग "A" संस्थापन के संशोधन संदर्भ में, अनुज्ञप्ति सं.**P/HQ/GJ/15/4798(P184279).**

Subject :- Existing Petroleum Class **"A"** installation at Plot No. 13, GIDC Estate Area,,Dahej, District : BHARUCH , State : Gujarat - Licence No. **P/HQ/GJ/15/4798(P184279)** - Reg Amendment of.

महोदय (Sir),

कृपया अपने पत्र क्रमांक GFL/Dahej/EP(O)Methanol/1/2011 , दिनांक 16/5/2011 का अवलोकन करें.
Please refer to your letter No. GFL/Dahej/EP(O)Methanol/1/2011 , dated 16/5/2011.

दिनांक 31/12/2012 तक वैध अनुज्ञप्ति संख्या P/HQ/GJ/15/4798(P184279), दिनांक 5/1/2007 निम्नलिखित पेट्रोलियम पदार्थो के वर्ग तथा मात्रा के भंडारकरण के लिए यथा संशोधित कर इस पत्र के साथ भेजी जा रही है
Licence No. P/HQ/GJ/15/4798(P184279) dated 5/1/2007 valid upto 31/12/2012 is returned herewith duly amended for the storage of following kinds and quantities of petroleum products

पेट्रोलियम का विवरण (Description of Petroleum)	किलोलीटरों में अनुज्ञप्त क्षमता (Quantity licenced in K.L.)
वर्ग क प्रपुंज पेट्रोलियम (Petroleum Class A in bulk)	240 किलोलीटर (KL)
वर्ग क प्रपुंज पेट्रोलियम से भिन्न (Petroleum Class A, otherwise than in bulk)	निरंक (Nil)
वर्ग ख प्रपुंज पेट्रोलियम (Petroleum Class B in bulk)	निरंक (Nil)
वर्ग ख प्रपुंज पेट्रोलियम से भिन्न (Petroleum Class B, otherwise than in bulk)	निरंक (Nil)
वर्ग ग प्रपुंज पेट्रोलियम (Petroleum Class C in bulk)	निरंक (Nil)
वर्ग ग प्रपुंज पेट्रोलियम से भिन्न (Petroleum Class C, otherwise than in bulk)	निरंक (Nil)
कुल क्षमता (Total Capacity)	**240 किलोलीटर (KL)**

आपके रुपए 5300/- कार्यालय में जमा है जो भविष्य में इसी अनुज्ञप्ति के लिए इस्तेमाल किए जाएंगे.
Your Balance Amount with the Department is Rs.5300/-, which will be used for processing of the same Licence in future.

भवदीय (Your's faithfully),

एस के शुक्ला (S K Shukla)
उप मुख्य विस्फोटक नियंत्रक (Deputy Chief Controller of Explosives)
कृते मुख्य विस्फोटक नियंत्रक
for Chief Controller of Explosives

प्रतिलिपि प्रेषित (Copy forwarded to) -

1 संयुक्त मुख्य विस्फोटक नियंत्रक, पश्चिमांचल, मुंबई
The Jt. Chief Controller of Explosives West Circle ,Mumbai
2 उप मुख्य विस्फोटक नियंत्रक, उप अंचल, वडोदरा
The Dy. Chief Controller of Explosives Vadodara Sub Circle Office ,Vadodara .

इसे अनुज्ञप्ति की प्रति एवं अनुमोदित नक्शे के साथ रखा जाए और अनुज्ञप्ति की पुरानी कार्यालय प्रति एवं नक्शा बदला जाए.
The same may please be kept along with copy of licence and approved drawings. The earlier office copy of licence & drawings may be replaced.

(अधिक जानकारी जैसे आवेदन की स्थिति, शुल्क आदि के लिए हमारी वेबसाइट http://peso.gov.in देखें.)
(For more information regarding status,fees and other details please visit our website http://peso.gov.in)

कृते मुख्य विस्फोटक नियंत्रक
for Chief Controller of Explosives

प्ररुप 15
(प्रथम अनुसूची का अनुच्छेद 6 देखिए)
FORM XV
(see Article 6 of the First Schedule)
संस्थापनों में पेट्रोलियम के आयात और भंडारकरण के लिए अनुज्ञप्ति
LICENCE TO IMPORT AND STORE PETROLEUM IN INSTALLATION

संशोधन नं. (Amendment No.) 1 दिनांक (dated) 6/6/2011

अनुज्ञप्ति सं. (Licence No.) :- **P/HQ/GJ/15/4798(P184279)** फीस रुपए (Fees Rs.) 3850 /- प्रति वर्ष (Per year)

श्री **M/s Gujarat Fluorochemicals Limited, 12/A,GIDC Dahej Industrial Estate,, Tal-Vagra, Bharuch,BHARUCH, Gujarat, PIN - 392130** को केवल इसमें यथा विनिर्दिष्ट वर्ग के और मात्राओं में पेट्रोलियम **240 किलोलीटर** आयात करने के लिए और उसका, नीचे वर्णित और अनुमोदित नक्शा संख्या **P/HQ/GJ/15/4798(P184279)** तारीख **6/6/2011** जो कि इससे उपाबद्ध है, में दिखाए गए स्थान पर भंडारकरण के लिए, पेट्रोलियम अधिनियम, 1934 के उपबंधो या उसके अधीन बनाए गए नियमों तथा इस अनुज्ञप्ति की अतिरिक्त शर्तों के अधीन रहते हुए यह अनुज्ञप्ति अनुदत्त की जाती है.

Licence is hereby granted to **M/s Gujarat Fluorochemicals Limited, 12/A,GIDC Dahej Industrial Estate,, Tal-Vagra, Bharuch,BHARUCH, Gujarat, PIN - 392130** valid only for the importation of **240 K.L** Petroleum of the classes and quantities as herein specified and storage thereof in the place described below and shown on the approved plan No **P/HQ/GJ/15/4798(P184279)** dated **6/6/2011** attached hereto subject to the provisions of the Petroleum Act, 1934 and the rule made thereunder and to the further conditions of this Licence.

यह अनुज्ञप्ति **31 दिसम्बर 2012** तक प्रवृत्त रहेगी।
The Licence shall remain valid upto **31st day of December 2012**

पेट्रोलियम का विवरण (Description of Petroleum)	किलोलीटरों में अनुज्ञप्त क्षमता (Quantity licenced in K.L.)
वर्ग क प्रपुंज पेट्रोलियम (Petroleum Class A in bulk)	240 किलोलीटर (KL)
वर्ग क प्रपुंज पेट्रोलियम से भिन्न (Petroleum Class A, otherwise than in bulk)	निरंक (Nil)
वर्ग ख प्रपुंज पेट्रोलियम (Petroleum Class B in bulk)	निरंक (Nil)
वर्ग ख प्रपुंज पेट्रोलियम से भिन्न (Petroleum Class B, otherwise than in bulk)	निरंक (Nil)
वर्ग ग प्रपुंज पेट्रोलियम (Petroleum Class C in bulk)	निरंक (Nil)
वर्ग ग प्रपुंज पेट्रोलियम से भिन्न (Petroleum Class C, otherwise than in bulk)	निरंक (Nil)
कुल क्षमता (Total Capacity)	**240 किलोलीटर (KL)**

अनुज्ञप्ति दिनांक (Licence Date) : 5/1/2007

कृते मुख्य विस्फोटक नियंत्रक
for Chief Controller of Explosives

अनुज्ञप्त परिसरों का विवरण और अवस्थान
DESCRIPTION AND LOCATION OF THE LICENSED PREMISES

अनुज्ञप्त परिसर जिसकी विन्यास सीमाएं अन्य विशिष्टयां संलग्न अनुमोदित नक्शे में दिखाई गई है **Plot No. 13, GIDC Estate Area,, Dahej,, BHARUCH, Gujarat,** स्थान पर अवस्थित है तथा उसमें निम्नलिखित सम्मिलित है :-**Three aboveground Petroleum Class A storage tanks together with other connected facilities.**

The licensed premises, the layout, boundaries and other particulars of which are shown in the attached approved plan are situated at **Plot No. 13, GIDC Estate Area,, Dahej,, BHARUCH, Gujarat,** and consists of **Three aboveground Petroleum Class A storage tanks together with other connected facilities.**

नवीनीकृत 31/12/2025 तक

उपमुख्य विस्फोटक नियन्त्रक, वडोदरा

R/up to 31/12/2015

18/11/13

उप मुख्य विस्फोटक नियंत्रक, वडोदरा
Dy. Chief Controller of Explosives, Vadodara

अनुज्ञप्ति संख्या- (Licence No.) **P/HQ/GJ/15/4798(P184279)**

नवीनीकरण के पृष्ठांकन के लिए स्थान
SPACE FOR ENDORSEMENT OF RENEWALS

पेट्रोलियम अधिनियम, १९३४ के उपबन्धों या उनके अधीन बनाए गए नियमों या इस अनुज्ञप्ति की शर्तों का उल्लंघन न होने की दशा में यह अनुज्ञप्ति फ़िस में बिना किसी छूट के तीन वर्ष तक नवीकृत की जा सकेगी. The licence shall be renewable without any concession in fee for three years in the absence of contravention of any provision of the Petroleum Act, 1934 or of the rules framed thereunder or of any of the conditions of this licence.	नवीकरण की तारीख Date of Renewal	समाप्ति की तारीख Date of Expiry	अनुज्ञापन प्राधिकारी के हस्ताक्षर और स्टाम्प Signature and office stamp of the licencing authority.
1)	29/10/2009	31/12/2012	आशेन्द्र सिंह (Ashendra Singh) विस्फोटक नियंत्रक (Controller of Explosives)

यदि अनुज्ञप्ति परिसर इसमें उपाबद्ध विवरण और शर्तों के अनुरुप नहीं पाए जाते है और जिन नियमों और शर्तों के अधीन यह अनुज्ञप्ति मंजूर की गई है उनमे से किसी का उल्लंघन होने की दशा में यह अनुज्ञप्ति रद्द की जा सकती है और अनुज्ञप्तिधारी प्रथम अपराध के लिए साधारण कारावास से, जो एक मास तक हो सकता है, या जुर्माने से, जो एक हजार रुपये तक हो सकता है, या दोनों से, और प्रत्येक पश्चातवर्ती अपराध के लिए साधारण कारावास से जो तीन मास तक हो सकता है, या जुर्माने से, जो पांच हजार रुपये तक हो सकता है, या दोनों से, दण्डनीय होगा.

This licence is liable to be cancelled if the licensed premises when inspected are not found conforming to the description and conditions attached hereto and contravention of any of the rules and conditions under which this licence is granted and the holder of this licence is also punishable for the first offence with simple imprisonment which may extended to one month, or with fine which may extend to one thousand rupees, or with both and for every subsequent offence with simple imprisonment which may extend to three months, or with fine which may extend to five thousand rupees or with both.

यदि निरीक्षण के समय अनुज्ञप्ति परिसर इसमें उपावद्ध विवरण और शर्तों के अनुरुप नही पाए जाते है और जिन नियमों और शर्तों के अधीन यह अनुज्ञप्ति मंजूर की गई है, मै से किसी का उल्लंघन होने की दशा में यह अनुज्ञप्ति रद्द की जा सकती है और अनुज्ञप्तिधारी प्रथम अपराध के लिए ऐसे साधारण कारावास से, जो एक मास तक का हो सकता है या जुर्माने से, जो एक हजार रुपये तक का हो सकता है, या दोनें से और प्रत्येक पश्चात्वर्ती अपराध के लिए साधारण कारावास से, जो तीन मास तक का हो सकेगा, या जुर्माने से, जो पांच हजार रुपये तक का हो सकेगा या दोनों से, दण्डनीय भी होगा।

The licence is liable to be cancelled if the licensed are not found conforming to the description and condition atta ched hereto and contravention of any of the rules and conditions under which this licence is granted and the holder of this licence is alo punishable for the first offence with simple imprisionment which may extend to one month or with fine which may extend to one thousand rupees, or with both and for every subsequent offence with simple imprisonment which may extend to three months, or with fine which may extend to five thousand rupees, or with both.

शर्तें

CONDITIONS

1 अनुज्ञप्त परिसरो का उपयोग मुख्य नियंत्रक की लिखित अनुज्ञा के बिना पेट्रोलियम के भंडारकरण और वितरण तथा उनसे प्रत्यक्षत सम्बन्धित प्रयोजनों से भिन्न किसी प्रयोजन के लिए नही किया जाएगा।

The licensed premises shall not without permission in writting from the Chief Controller, be used for any purpose other than he storage and distribution of petroleum and purposes directly connected therewith.

2 पेट्रोलियम केवल भंडारकरण टैंकों और भंडारकरण तथा भराई शैडों में या इस प्रयोजन के लिए इससे उपाबद्ध नक्शों में विनिदिष्ट संख्या भीतर अनुमोदित स्थानों में ही रखा जाएगा।

3 (i) टैंक भली भांति डिजाइन की गई नीवों के ऊपर अधारित होंगे और या तो भूमि के नीचे दबाकर रखे जायेंगे या खुले में लगाए जायेंगे तथा चतुर्दिक दीवार या तटबंध से घिरे होंगे, जो अधिक से अधिक दो मीटर उंचे और मिट्टी, स्टील, कंकरीट या ठोस चिनाई किए गए होंगे, ताकि वे दूव स्थैतिक भार को पूरी तरह सहन करने में समर्थ हो। १ मीटर से उंची मिट्टी, की दीवार का शिखर द्वल,द्वैट सैक्शन 0.6 मीटर से कम चौडा नही होना चाहिए।

The tank or tanks shall be supported on well-designed foundations and shall be either buried underground or installed in the open and surrounded by wall or embankment not more than 2 metres high and made of earth, steel, concrete or solid masonry capable of withstanding fully hydrostatic load. Earth wall of over 1m. high shall have not less than 0.6m. wide flat section on top.

परन्तु दो मीटर से अधिक उची दीवार या तटबन्ध धी अनुज्ञापन प्राधिकारी द्वारा वहां दी जा सकती है जहां ऐसी विशेष परिस्थितियां है जिनमें उसकी राय में ऐसी वृद्धी की अनुज्ञा दी जानी चाहिए।

Provided that a wall or embankment higher than 2m may be allowed by the licensing authority where there are special circumstances which, in his opinion warrant such increase.

(ii) अहाते के भीतर की भूमि अहाते बाहर की भूमि से निम्नतर तल वाली नही होगी और उसका ढलान इस प्रकार से बनाया जाएग कि वह टैंक से नाली या कुंड की ओर आधा प्रतिशत से कम न हो।

The ground within the enclosure shall not be lower than the level of the ground outside the enclosure and shall be finished to form a slope of not less than half a percent from the tank towards the drain or sump.

परन्तु इस, खण्ड की कोई बात उस अहाते की दशा में लागू नहीं होगी जो उचित ढलान वाले भूमिगत जल निकासी प्रणाली से होकर एक नमूने के अनुसार पर्याप्त क्षमता वाले दक्ष तेल अवरोधक से जुडा हुआ है।

Provide that nothing in this clause shall apply in the case of an enxlosure which is connected to and efficient oil interceptor of ample capacity through an underground drainage system having proper slope.

(iii) अहाते में निकासी का नियंत्रण एक वाल्व से किया जाएगा जो आग लगने की दशा मे सुगम्य, होगा और अहाते के बाहर से ही संचालित किए जाने योग्य होगा। अहाते में से भूपृष्ठ जल निकास नलियां एक दक्ष तेल अंतारोधक से होकर गुजरनी चाहिए।

The drainage from the enclosure shall be controlled by a vaive which shall be accessible under fire conditions and be capable of being operated from outside the enclosure. All surface water drainage from the enclosure shall be passed through an efficient oil interceptor.

(iv) जहां एक अहाते में दो या अधिक टैकों को लगाया गया है, वहां अहाते में टैंकों की कुल क्षमता परम्परागत स्थिर छत टैंकों दशा में ६०,००० किलोलीटर से अधिक नही होनी चाहिए और प्लवमान छत टैंकों का विशेष डिजाइन वाले टैंकों की दशा में 1,20,000 किलो लीटर से अधिक नही होगी। ऐसे अहाते को व्यापक लम्बाई–चौडाई की चिनाई किए गए चैनलों अथवा मध्यवर्ती दीवारों से जो कम से कम 0.6 मीटर उंची होनी चाहिए विभाजित किया जाएगा ताकि एक टैंक की छलकन से उसी अहाते में किसी अन्य टैंक को खतरा पहुंचने से रोका जाए।
स्पष्टीकरण : इस खण्ड के प्रयोजनों के लिए छोटे–छोटे टैंकों को ऐसा समूह जिसमें प्रत्येक टैंक का व्यास में ९ मीटर से अधिक न हो और क्षमता में कुल मिलाकर 5000 किलोलीटर से अधिक न हो, एक टैंक माना जाएगा।

Where two or more tanks are installed in one enclosure the total capacity of the tanks in the enclosure shall not exceed 60,000 kilolitres in the case of conventional fixed-roof tank and 1,20,000 kilolitres i n the case of floating roof tank or those of special design (where there is a combinations of fixed and floating roof tanks in the same enclosure then the total capacity of fixed-roof tanks and floating roof tanks shall not exceed 60,000 kilolitres). Such an enclosure shall be sub-divided by masonry channels of ample dimentions or by intermediate wall of not less than 0.6m in height to prevent spills from one tank endangering any other tank in the same enclosure.

Explanation : For the purpose of this clause, a group of small tanks each not exceeding 9 m in diameter and in all not exceeding 5,000 kilolitres in capacity shall be treated as one tank.

(v) (क) जहां अहाते में वर्ग क या वर्ग ख के पेट्रोलियम का भंडारकरण किया जाता है या वर्ग ग के पेट्रोलियम का वर्ग क या वर्ग ख के पेट्रोलियम के साथ भंडारकरण किया जाता है वहां अहाते की क्षमता, अहाते में के सबसे बड़े टैंक की क्षमता का शत प्रतिशत उसी अहाते में के स अन्य टैंकों के आयतन को घटाने के पश्चात अहाते की दीवार की उंचाई तक, शत प्रतिशत होना चाहिए।

(ख) जहां अहाते में केवल वर्ग ग पेट्रोलियम का भंडारकरण किया जाता है वहां अहाता दीवार उचाई एक मीटर से कम नही होगी।

(a) Where petroleum Class A or petroleum Class B is stored in the enclosure or petroleum Class C is stored along with petroleum Class A or Class B, the capacity of the enclosure shall be hundred perdent of capacity of the largest tank in the enclosure after deducting the volume up to the height of the enclosure wall, of all other tanks in the same enclosure.

(b) Where petroleum Class C is only stored in the enclosure the height of the enclosure wall shall be not less than one metre.

(vi) अहाते के भीतर का स्थान जो टैंक या टैंकों से न घरा हुआ हो, उन आवश्यक पाईपों और वाल्वों तथा अनुमोदित विद्युत प्रकाश के सिवाय सर्वदा साफ और खाली रखा जाएगा।

Except for necessary pipes and valves and approved electric lights, the space within and enclosure and not occupied by tank of tanks shall be kept entirely clear and unoccupied.

4. सभी टैंकों में वेंट पाइप लगाए जायेंगे जो खुले वायुमंडल तक जाने चाहिए और उनका खुला हुआ सिरा तांबे या अन्य असंक्षरणीय धातु की तार की जाली से दो परतों से ढका हुआ होना चाहिए जिस में प्रीत लाइनियम सेंटीमीटर कम से कम 11 मैश हों, और उस पर हुड लगा हुआ होना चाहिए अथवा टैंक में अनुमोदित मोचन वाल्व या खतरनाक आंतरिक या बाहा दबाव निवारण के लिए अन्य अनुमोदित साधना लगा हुआ होना चाहिए। एक टैंक की वेंट पाईप और मोचन वाल्व किसी अन्य टैंक की वेंट पाइप या मोचन वाल्व से अन्तर्संरब्ध नही होना चाहिए।

All tanks shall be fitted with vent pipes leading into the open air, the open end being covered with twolayers of fine copper or other non corrodible metal wire a hood or the tank shall be fitted with an approved relief valve or other approved means of preveling dangerous internal or external pressures. The vent pipe and the relief valve of one tanks shall not be interconnected with those of any other tank.

5. किसी टैंक में ढलवा लोहे के वाल्व अनुज्ञात नही है और सस्थापन में के सभी वाल्वों पर स्थायी रुप से वाल्व को खोलने और बन्द करने के निर्देश स्पष्टतया उपदर्शित करने वाले रीति में अंकित किए जाने चाहिए।

Cast-iron valves are not permitted on any tank and all valves in an installation must be permanently marked in a manner clearly indicating the direction of opening and shutting the valve.

6. पम्प उस प्रकार के होंगे और केवल ऐसी स्थिति में लगाए जाएंगे जो इससे संलग्न नक्शे में दिखाए गए हैं या दिखाई गई है और वे तथा उनके सभी कनेक्शन और फिटिंग इस प्रकार से निर्मित होंगे और बनाए रखें जायेंगे ताकि पेट्रोलियम चने से रोका जा सकें।

Pumps shall be of a type and placed only in the positicn shown on the plan attached threto and they shall together with all connections and fittings be so constructed and maintained as to prevent leakage ofpetroleum.

7. कन्टेनरों के भंडारकरण या भराई शैड उपयुक्त उज्वलनशील सामग्री से निर्मित होंगे। शैड आधारी दीवारों पर आधारित होगा और उसके चारों ओर इस प्रकार मजबुती से बनी हुई दीवार या तटबन्ध होना चाहिए जिससे कि 0.25 मीटर से अन्यून और मीटर से अनधिक गहरा कुंड या अहाता तैयार हो जाए। इस प्रकार से बना कुंड या अहाता ऐसी यथेष्ट क्षमता का होना चाहिए ताकि जितनी पेट्रोलियम की एक समय में शैड में मौजूद होने की सम्भावना है, उसकी अधिकतम मात्रा की कम से कम एक चौथाई मात्रा बिना च्यवन के उसमें रखी जा सके। कुंडों और अहातों को साफ और ज्वलनशील द्रवों के सचयन से युक्त रखा जाना चाहिए।

Storage of filling sheds for containers shall be constructed of suitable uninflammable material. The shed shall rest foundation walls and shall besurrounded by a wall or embankment ofsubstantial construction so as to form a sump or enclosure not less than 0.25 m not more than 1m deep. The sump or enclosure thus formed shall be ofsufficient capacity to contain without leakage not less than one-fourth of the masimum quantity of petroleum likely to be present in the shed at any one time. The sumps and enclosures must be kept clean and free from any accumulation ofinflammable liquids.

8. वर्ग क और वर्ग ख को प्रपुंज से भिन्न पेट्रोलियम के भंडारकरण या भराई के लिए प्रत्येक अहातेदार शैड पेट्रोलियम के च्यवन के निवारण के लिए बनाई गई दीवारों के ठीक उपर भूमितल के निकट और छत के भी निकट यथेष्ट रुप से संबंधित होना चाहिए।

Every enclosed shed for the soreage or filling of petroleum Class A and Class B otherwise then in bulk shall be adeuately ventilated near the ground level immediately above the walls constructed to prevent leakage of petroleum and also near or in the roof.

9. (i) टैंक यानों की भराई, खाली किया जाना या उनका खड़ा किया जाना इस प्रयोजन के लिए अनुमोदित और इससे उपाबद्ध नक्शे में दिखाई गई स्थितियों के अनुसार ही होना चाहिए। नियम 62 से 86 तक के उद्धरण स्थानीय भाषा में और हिन्दी तथा अंग्रेजी में, प्रत्येक ऐसी स्थिती में बड़े–बड़े अक्षरों में छपवाकर प्रदर्शित किए जाने चाहिए।

(ii) ऐसा टैंक यान जन इन नियमों के अध्याय 3 के भाग 4 में अभिकथित अपेक्षाओं का पूर्णतया अनुपालन नहीं करेगा, उसकी अनुज्ञप्त परिसरों के भीतर लदाई या उतराई नही की जाएगी या उन्हें खडा नही किया जाएगा।

(a) Tank vehicles shall be filled, discharged or stabled only in the positions approved for the purpose and shown on the plan attached hereto. An extract of rules 62 to 86 printed in bold letters in the local language and in Hindi and English shall be prominently displayed at each such position.

(b) A tank vehicle which does not fully comply with the requirement laid down in Part-IV of chapter III of these rules shall not be loaded, unloaded or stabled within the licensed premises.

10. पेट्रोलियम के भंडारकरण, लदाई, उतराई या पम्प करने के लिए प्रत्येक सुविधा और किसी अन्य सुविधा, भवन, चौहदी बाड या संरक्षित, सकर्म के बीच संलग्न सारण 1, 2 और 3 में विनिर्दिष्ट के दूरी से सभी समयों घर, रहनी चाहिए।

(क) उस संस्थापन की दशा में जहां भूमोपरि भंडारकृत वर्ग क और वर्ग ख के प्रपुंज पेट्रोलियम की कुल मात्रा 5000 किलोलीटर से अधिक है या जहां ऐसे पेट्रोलियम के भंडारकरण के लिए किसी टैंक की परिधि (ख) के उपबंध के अधीन रहते हुए 9 मीटर से अधिक

5

सारणी 1

(अनुज्ञप्ति प्ररुप 15 की शर्त 10 (क) देखिए)

ऐसे सस्थापन मे सुविधाओं से चतुर्दिक बनाए रखी जाने वाली दूरी जहा प्रपूज वर्ग क और वर्ग ख पेट्रोलियम की भूमि के ऊपर भडारकृत समस्त मात्रा 5000 किलोलीटर से अधिक है या जहां पेट्रोलियम के भडारकरण के लिए ऐसे टैंक का व्यास 9 मीटर से अधिक है

1. इस सारणी मे, –

'ब' से बडे टैंक का व्यास अभिप्रेत है,

'छो' से छोटे टैंक का व्यास अभिप्रेत है,

'उ' से निर्माण सम्बन्धी या संचालन संबंधी सुविधा के लिए उपयुक्त कोई दूरी अभिप्रेत है,

2. जहा अनुकल्पी दूरिया विनिर्दिष्ट की गई है वहां न्यूनतम दूरी का अनुपालन किया जा सकेगा।

3. सभी दूरिया प्रत्येक सुविधा के परिमाप मे निकटतम स्थलों के बीच मापी जाएगी सिवाय उस टैंक यान लदाई / उतराई क्षेत्र के जहा केन्द्र से दूरी ऐसे लदाई / उतराई के लिए प्रत्येक दिन से मापी जाएगी।

प्रेषित	वर्गक पेट्रोलियम के भडारकरण टैंक	वर्ग ख पेट्रोलियम के भडारकरण टैंक	वर्ग ग पेट्रोलियम भडारकरण टैंक	वर्ग क और वर्ग ख पेट्रोलियम के लिए भडारकरण भराई शेड	वर्ग ग पेट्रोलियम के लिए भण्डार करण भराई शेड उतराई क्षेत्र	वर्ग क या वर्ग ख पेट्रोलियम के लिए टैंक यान लदाई/ क्षेत्र	वर्ग ग पेट्रोलियम के लिए टैंक यान लदाई/उतराई	ज्वालासह विद्युत पम्प	सस्थापन के भीतर कार्यालय भवन कर्मशाला भण्डार, सुविधाओ फायर स्टेशन आदि	सस्थापन के चारो और चौहदी बाड़ा	
	1	2	3	4	5	6	7	8	9	10	11
1 वर्ग क पेट्रोलियम के लिए भण्डारकरण टैंक	0.5 व या छोया	0.5 व या छोया	6 मी	15 मी	15 मी	15 मी	15 मी	8 मी	15 मी	15 मी	20 मी
2 वर्ग ग पेट्रोलियम के लिए भण्डारकरण टैंक	0.5 व या छोया	0.5 व या छोया	6 मी	15 मी	15 मी	15 मी	15 मी	8 मी	15 मी	15 मी	15 मी
3 वर्ग ग पेट्रोलियम के लिए भण्डारकरण टैंक	6 मी	6 मी	उ	15 मी	उ	8 मी	उ	उ	उ	8 मी	4.5 मी
4 वर्ग क और वर्ग ख पेट्रोलियम के लिए भण्डारकरण/भराई शेड	15 मी	15 मी	15 मी	उ	8 मी	15 मी	15 मी	8 मी	15 मी	15 मी	15 मी
5 वर्ग ग पेट्रोलियम के लिए भण्डारकरण/भराई शेड	15 मी	15 मी	उ	8 मी	उ	8मी	उ	उ	उ	8 मी	4.5 मी
6 वर्ग क पेट्रोलियम के लिए टैंक यान लदाई/उतराई क्षेत्र	15 मी	15 मी	8 मी	15 मी	8 मी	उ	उ	8 मी	15 मी	15 मी	15 मी
7 वर्ग ग पेट्रोलियम के लिए टैंक यान लदाई / उतराई क्षेत्र	15 मी	15 मी	उ	15 मी	उ	उ	उ	उ	उ	8 मी	3 मी
8 ज्वालासह विद्युत पम्प	8 मी	8 मी	उ	8 मी	उ	8 मी	उ	उ	8 मी	8 मी	3 मी
9 अज्वालासह विद्युत पम्प भण्डारकरण/भराई शेड	15 मी	15 मी	उ	15 मी	उ	15 मी	उ	8 मी	उ	3 मी	उ
10 कार्यालय, भवन, कर्मशाला भण्डार सुविधा फायर स्टेशन आदि	15 मी	15 मी	8 मी	15 मी	8 मी	15 मी	8 मी	8 मी	3 मी	उ	उ
11 सस्थापन के चारो और चौहदी बाड़ा	20 मी	15 मी	4.5 मी	15 मी	4.5 मी	15 मी	3 मी	3 मी	उ	उ	उ

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TABLE 1

[See condition 10 (a) of licence Form XV]

Distance to be observed arond facilities in an installatino where total quantity of petroleum Class A and petroleum Class B stored above ground in bulk exceeds 5,000 kilolitres, or where the diameter of any such tank for the storage of petroleum exceeds 9 meters :

1. In this table :-
   "D" means diameter of large tank.
   "d" means diameter of small tank.
   "x" means any distance suitable for constructional or operational convenience.
2. Where altemative distances are specified, minimum there of may be observed.
3. All distances shall be measured between the points in the perimeter of each facility except in the case of tank vehicle loading / unloading area where the distance shall be measured from the centre of each bay for such loading / unloading.

To from	Storage tank for petroleum Class A	Storage tank for petroleum Class B	Storage tank for petroleum Class C	Storage/ filling Shed for petroleum Class A or Class B	Storage/ filling shed for petroleum Class C	Tank vehicle loading/ unloading area for petroleum Class A or Class B	Tank vehicle loading unloading area for Petroleum Class C	Flame proof electric pump	Non flame proof electric pumps	Office building workshops stores amenities fire station, etc. within installation	Boundry fencing around installa-tion
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Storage tank for Petroleum Class A	0.5 D or d or 15 m	0.5 D or d or 15 m	6 m	15 m	15 m	15 m	15 m	8 m	15 m	15 m	20 m
2. Storage tank for Petroleum Class B	0.5 D or d or 15 m	0.5 D or d or 15 m	6 m	15 m	15 m	15 m	15 m	8 m	15 m	15 m	15 m
3. Storage tank for Petroleum Class C	6 m	6 m	x	15 m	x	8 m	x	x	x	8 m	4.5 m
4. Storage / filling shed for Petroleum Class A or Class B	15 m	15 m	15 m	x	8 m	15 m	15 m	8 m	15 m	15 m	15 m
5. Storage / filling shed for Petroleum Class C	15 m	15 m	x	8 m	x	8 m	x	x	x	8 m	4.5 m
6. Tank Vehicle loading / unloading area for Petroleum Cass A or B	15 m	15 m	8 m	15 m	8 m	x	x	8 m	15 m	15 m	15 m
7. Tank Vehicle loading / unloading area for Petroleum Cass C	15 m	15 m	x	15 m	x	x	x	x	x	8 m	3 m
8. Flame Proof Electric Pump	8 m	8 m	x	8 m	x	8 m	x	x	8 m	8 m	3 m
9. Non Flame Proof Electric Pump	15 m	15 m	x	15 m	x	15 m	x	8 m	x	3 m	x
10. Office Building workship, stores amenities, fire fire station, etc. within installation	15 m	15 m	8 m	15 m	8 m	15 m	8 m	8 m	3 m	x	x
11. Boundary fencing around installation.	20 m	15 m	4.5 m	15 m	4.5 m	15 m	3 m	3 m	x	x	x

सारणी 2

(प्रस्तुप 15 की शर्त 10 (ख) देखिए)

भंडारकरण टैंकों के बीच परस्पर दूरी

	प्लवमान छत	स्थित छत टैंक (वर्ग क और ख पेट्रोलियम)	वर्ग ग
50 मीटर तक व्यास वाले सभी टैंक	(ई घ) / 4	(ई +) / 4	(ई + घ) / 6
50 मीटर से अधिक व्यास वाले सभी टैंक	(ई + घ) / 4	(ई + घ) / 3	(ई + घ) / 4

टिप्पण :

1. यह सारणी ऐसे संस्थानों लिए लागू होती है जहां भूमि के ऊपर भंडारकृत वर्ग क और वर्ग ख पेट्रोलियम की सकल भंडारकरण क्षमता 5000 क्युबेक मी. से अधिक है या जहां के भंडारकरण के लिए ऐसे टैंक का व्यास 9 मीटर से अधिक है।

2. दी गई दूरी शेल से शेल तक वैसी ही डार्क में है।

3. संकेत पद्धति :

"ब" मीटरों में बड़े टैंक का व्यास "घ" मीटरों में टैंक का व्यास

4. यदि यथोपरि संगणित परस्पर दूरी (वर्ग क और वर्ग ख के लिए) 15 मीटर से कम है तो 15 मी. का न्यूनतम या 05 "ब" या "घ" का पालन किया जाएगा।

"ब" या "घ" का पालन किया जाएगा।

5. वर्ग क/ख भंडारण टैंक और ग भंडारण टैंकों के बीच की पस्पर दूरी 6 मीटर से अन्यून नहीं होगी।

TABLE - 2

(See condition 10 (b) of Licence form XV)

Inter distance Between Storage Tanks

Item	Floating Roof	Fixed Roof Tanks	Class C
All tank with diameters Up to 50 meters	(D + d) / 4	(D + d) / 4	(D + d) / 6
All tank with diameters exceeding 50 meters	(D + d) / 4	(D + d) / 3	(D + d) / 4

NOTES :

1. This table is applicable for installations where aggregate storage capacity of Class A and Class B petroleum stored above grade exceeds 5000 kilolitres or where the diameter of any such tank for te storage of petroleum exceeds 9 m.

2. Distance given are shell to shell in the same dyke.

3. Notation :

   D - diameter of larger tank in metres

   d - diameter of smaller tank in metres

4. If the inter distance (for class A & B) calculated as above are less than 15m, then minimum of 15 m or 0.5 D or d shall be followed.

5. Inter distance between class A/B storage tanks and class C storage thanks shall not be less than 6 meters.

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सारणी 3

(अनुज्ञप्ति प्ररुप 15 की शर्त 10 (ख) देखिए)

निम्नलिखित संस्थापन में सुविधाओं से चतुर्दिक रखी जाने वाली दूरी –

(i) जहां केवल वर्ग ग पैट्रोलियम का भण्डारकरण किया जाता है,

(ii) जहां वर्ग क और वर्ग ख प्रपुज पेट्रोलियम की भूमोपरि भंडारकरण की जाने वाली कुल मात्रा 5000 किलो लीटर से अधिक नहीं,

(iii) जहां वर्ग क या वर्ग ख पेट्रोलियम के भंडारकरण के लिए किसी टैंक का व्यास 9 मीटर से अधिक नहीं है।

(1) इस सारणी में 'व्या' से टैंक का व्यास अभीप्रेत है और 'उस' से निर्माण सम्बन्धी और संचालन संबंधी सुविधा के लिए उपयुक्त दूरी अभिप्रेत है।

(2) जहां अनुकल्पी दूरियां विनिर्दिष्ट की गई हैं वहां न्यूनतम दूरी का अनुपालन किया जाएगा।

(3) सभी दूरियां प्रत्येक सुविधा में निकटतम स्थलों के बीच मापी जाएगी सिवाये उस टैंक वाहन लदाई / उतराई क्षेत्र में के जहां दूरिया माप ऐसी लदाई / उतराई के लिए प्रत्येक दिन से लिया जाएगा।

प्रेषित	वर्ग क पेट्रोलियम के लिए भण्डारकरण टैंक	वर्ग ख पट्रोलियम के लिए भंडारकरण टैंक	वर्ग ग पेट्रोलियम के लिए भण्डारकरण टैंक	वर्ग क पेट्रोलियम के लिए भंडारकरण टैंक	वर्ग ख पेट्रोलियम के लिए भण्डारकरण भराई शेड	वर्ग ग पेट्रोलियम के लिए भंडारकरण भराई शेड	वर्ग क पेट्रोलियम के लिए टैंक यान लदाई/ उतराई क्षेत्र	वर्ग ख पेट्रोलियम के लिए टैंक यान लदाई/ उतराई क्षेत्र	वर्ग ग पेट्रोलियम के के लिए टैंक यान लदाई	ज्वालासह विद्युत, पम्प	अज्वला सह विद्युत पम्प	संस्थापन के भीतर कार्यालय भवन, भण्डार सुविधायें आदि	संस्थापन के चारो ओर चौहदी बाड़ा
	1.	2.	3.	4.	5.	6	7.	8.	9.	10	11	12.	13.
1 वर्ग क पेट्रोलियम के लिए भण्डारकरण टैंक	0.5 व्या या 6 मी	0.5 व्या	0.5 व्या	9 मी	9 मी	9 मी	15 मी	15 मी	15 मी	3 मी	15 मी	15 मी न्यूनतम	15 मी न्यूनतम
2 वर्ग ख पेट्रोलियम के लिए भण्डारकरण टैंक	0.5 व्या या 6 मी	0.5 व्या	0.5 व्या	9 मी	0.5 मी	0.5 मी	9 मी	4.5 मी	4.5 मी	3 मी	4.5 व्या	व्या न्यूनतम	व्या न्यूनतम
3 वर्ग ग पेट्रोलियम के लिए भण्डारकरण टैंक	0.5 व्या या 6 मी	0.5 व्या	उ	9 मी	0.5 व्या	उ	9 मी	4.5 मी	उ	उ	उ	0.5 व्या न्यूनतम 3 मी	0.5 व्या न्यूनतम 3 मी
4 वर्ग क पेट्रोलियम के लिए भण्डारकरण/भराई शेड	9 मी	9 मी	9 मी	उ	4.5 मी	6 मी	9 मी	9 मी	9 मी	3 मी	9 मी	9 मी	9 मी
5 वर्ग ख पेट्रोलियम के लिए भण्डारकरण/भराई शेड	9 मी	0.5 व्या	0.5 व्या	4.5 मी	उ	1.5 मी	9 मी	4.5 मी	4.5 मी	1.5 मी	4.5 मी	4.5 मी	4.5 मी
6 वर्ग ग पेट्रोलियम के लिए भण्डारकरण /भराई शेड	9 मी	0.5 मी	उ	6 मी	1.5 मी	उ	9 मी	4.5 मी	उ	उ	उ	3 मी	3 मी
7 वर्ग क पेट्रोलियम के लिए टैंक यान लदाई / उतराई क्षेत्र	15 मी	9 मी	9 मी	9 मी	9 मी	9 मी	उ	9 मी	9 मी	3 मी	9 मी	9 मी	9 मी
8 वर्ग ख पेट्रोलियम के लिए टैंक यान लदाई/उतराई क्षेत्र	15 मी	4.5 मी	4.5 मी	9 मी	4.5 मी	4.5 मी	9 मी	उ	4.5 मी	1.5 मी	4.5 मी	4.5 मी	4.5 मी
9 वर्ग ग पेट्रोलियम के लिए टैंक यान लदाई/उतराई क्षेत्र	15 मी	4.5 मी	उ	9 मी	4.5 मी	उ	9मी	4.5 मी	उ	उ	उ	3 मी	3 मी
10 ज्वालासह विद्युत पम्प	3 मी	3 मी	उ	3 मी	1.5 मी	उ	3 मी	1.5 मी	उ	उ	3 मी	उ	उ
11 अज्वाला सह विद्युत पम्प	15 मी	4.5 मी	उ	9 मी	4.5 मी	उ	9 मी	4.5 मी	उ	3 मी	उ	उ	उ
12 संस्थापन के भीतर कार्यालय भवन, भण्डार सुविधाए आदि	15 मी	व्या न्यूनतम 4.5 मी	0.5 व्या न्यूनतम 3 मी	3 मी	4.5 मी	3 मी	9 मी	4.5 मी	3 मी	उ	उ	उ	उ
13 संस्थापन के चारो ओर चौहदी बाड़ा	15 मी	व्या न्यूनतम 4.5 मी	0.5 व्या न्यूनतम 3 मी	9 मी	4.5 मी	3 मी	9 मी	4.5 मी	3 मी	उ	उ	उ	उ

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TABLE - 3

[See condition 10 (b) of licence Form XV]

Distances to be observed around facilities in an installation where :-

(i) Only petroleum Class C is stored ;
(ii) Total quantity of pertroleum Class A and petroleum Class B stored above ground in bulk does not exceeds 5,000 kilolitres;
(iii) The diameter of any tank for storing petroleum Class A or Class B does not exceed 9 meters.

1. In this table "D" means diameter of large tank and "X" means any distance suitable for constructional or operational convenience.
2. Where alternatives distances are specified, minimum there of may be observed. All alternatives distances shall be measured between the nearest points in the perimeter of each facility except in the case of tank vehicle loading/unloading area where the distance shall be measured fromthe centre of each bay for such loading / unloading

To / From	Storage tank for Petroleum Class A	Storage tank for Petroleum Class B	Storage Tank for Petroleum Class C	Storage /filling shed for petroleum Class A	Storage /filling shed for petroleum Class B	Storage /filling shed for petroleum Class C	Tank Vehicle loading/un loading area for petroleum Class A	Tank Vehicle loading / un loading area for petroleum Class B	Tank Vehicle loading / un loading area for petroleum Class C	Flame Proof Electric Pump	Non Flame Electric Pump	Office building stores amenities Station etc. with installation	Boundary Fencing around installation
	1.	2.	3	4	5.	6.	7.	8.	9.	10	11.	12	13.
1. Storage tank for Petroleum Class A	0.5 D or 6 m	0.5 D	0.5 D	9 m	9 m	9 m	15 m	15 m	15 m	3 m	15 m	15 m min	15 m min
2. Storage tank for Petroleum Class B	0.5 D or 6 m	0.5 D	0.5 D	9 m	0.5 m	0.5 m	9 m	4.5 m	4.5 m	3 m	4.5 m	D min 4.5m	D min 4.5m
3. Storage tank for Petroleum Class C	0.5 D or 6 m	0.5 D	x	9 m	0.5 D	x	9 m	4.5 m	x	x	x	0.5 D min 3 m	0.5 D min 3 m
4. Storage/filling shed for Petroleum Class A	9 m	9 m	9 m	x	4.5 m	6 m	9 m	9 m	9 m	3 m	9 m	9 m	9 m
5. Storage/filling shed for Petroleum Class B	9 m	0.5 D	0.5 D	4.5 m	x	1.5 m	9 m	4.5 m	4.5 m	1.5 m	4.5 m	4.5 m	4.5 m
6. Storage/filling shed for Petroleum Class C	9 m	0.5 m	x	6 m	1.5 m	x	9 m	4.5 m	x	x	x	3 m	3 m
7. Tank Vehicle loading/unloading area for petroleum Class A	15 m	9 m	9 m	9 m	9 m	9 m	x	9 m	9 m	3 m	9 m	9 m	9 m
8 Tank Vehicle loading/unloading area for petroleum Class B	15 m	4.5 m	4.5 m	9 m	4.5 m	4.5 m	9 m	x	4.5 m	1.5 m	4.5 m	4.5 m	4.5 m
9. Tank Vehicle loading/unloading area for petroleum Class C	15 m	4.5 m	x	9 m	4.5 m	x	9 m	4.5 m	x	x	x	3 m	3 m
10. Flame Proof Electric Pump	3m	3 m	x	3 m	1.5 m	x	3 m	1.5 m	x	x	3 m	x	x
11. Non Flame Proof Electric Pump	15 m	4.5 m	x	9 m	4.5 m	x	9 m	4.5 m	x	3 x	x	x	x
12 Office building workshop stores amenities fire fire station etc	15 m	D min 4.5 m	0.5 D min 3 m	3 m	4.5 m	3 m	9 m	4.5 m	3 m	x	x	x	x
13 Boundary fencing around installation	15 m	D min 4.5 m	0.5D min 3 m	9 m	4.5 m	3 m	9 m	4.5 m	3 m	x	x	x	x

है, तो सारणी 1 और सारणी 2।

(ख) किसी ऐसे संस्थापन की दशा में जहां केवल ग पेट्रोलियम का भंडारकरण किया जाता है या जहां भूमोपरि भंडारकृत वर्ग क और वर्ग ख के प्रयुज पेट्रोलियम की मात्रा 5000 किलोलिटर से अधिक नहीं है तथा वर्ग क या वर्ग ख के पेट्रोलियम के भंडारकरण के लिए किसी टैंक की परिधि 9 मीटर से अधिक नहीं है, तो वहां सारण 3 में इस नियम के प्रकाशन के पश्चात अनुमोदित सभी नई प्राथमिक परिष्करणशालाओं / संस्थापनों के विन्यास समय–समय पर यथा संशोधित तेल उद्योग सुरक्षा निदेशालय मानक 118 के अनुरूप होंगे। यह इन परिष्करणशालाओं / संस्थापनों को लागू नहीं होगा जो मूल तेल उद्योग सुरक्षा निदेशालय मानक 118 के प्रकाशन से पूर्व विद्यमान थी और / या निर्माणधीन थी।

Every facility for the storage, loading, unloading orpumping of petroleum shall at all times maintain from any other facility, binding, boundary fencing or protected works the distances specified in the Tables 1,2and 3.

(a) Table 1 and Table 2 in the case of installation where the total quantity of petroleum Class A and petroleum Class B stored above ground in buld exceeds 5000 kilolitres or where the diameter of any tank for the stoage of such petroleum exceeds 9meters, or

(b) Table 3 in the case of installation where only petroleum Class C is stored or where the total quantity of petroleum Class A and petroleum Class B stored above ground in the buld does not exceed 5000 kilolitres and the diameter of any tank for storing petroleum Class A or petroleum Class B does not exceed 9 metres.

इसमें किसी प्रतिकूल बात के होते हुए भी, जहां किसी कूप, पम्प स्टेशन, पेट्रो–रसायनिक संयंत्र या परिष्करणशाला पर या उसके निकट किसी संस्थापन में पेट्रोलियम का भंडारकरण किया जाता है वहां उपाबद्ध सारण 2 में दी गई दूरियां लागू नहीं होंगी और कोई भंडारकरण टैंक जिसकी क्षमता 250 किलोलीटर से अधिक है, और कोई पेट्रोलियम भंडारकरण या भराई शेड / क्षेत्र किसी बायलर, भट्टी या अग्नि के 90 मीटर से निकट नहीं होनी चाहिए। ऐसे संस्थापन में सभी टैंक एक संहत क्षेत्र में स्थित होंगे तथा (क) एक ही नियंत्रण के अन्तर्गत, (ख) एक ही अविच्छिन्न / बाड़े द्वारा घिरे हुए या घेरे जाने योग्य और (ग) ऐसे स्थान पर जहां कोई संरक्षित संकर्म न हो, होंगे।

The layoults of all new g r ass root refineries@installations approved subsequent to the publication of this rule, shall conform to the oil Industry Safety Director's Standard 118 , as amended from time to time. This shall not apply to refineries/ installations existing and/or uner construction before the publication of the original OISD standard-118. Not withstanding anything herein to the contrary when petro-chemical plants or refineries, the concessional distances given in the attached Table 2 shall not apply and no storage tank, the capacity of which exceeds 250kilolitres and no petro leum storage of filling sheds/area shall be placed nearer then 90 metres to any boiler, furnace of fire. In such an installation all tanks shall be situated in a compact area (a) under a single control, (b) enclosed or capable of being enclosed by one continuous fence and (c) which there shall be no protected works.

11. शर्त 10 में विनिर्दिष्ट दूरियां अनुज्ञापन प्राधिकारी द्वारा उन दशाओं में कम की जा सकती है जहां विशेष पूर्वावधानियां बरती जाती है और जहां कोई ऐसी विशेष परिस्थितियां है जिनमें, उसकी राय में, दूरियों का इस प्रकार से घटाया जाना उचित है।

The distances specified in condition 10 may be reduced by the licensing authority in cases where special precautions are taken and wherethere are special circumstances which, in his opinion, warrant such reduction.

12. संस्थापन में कोई परिवर्तन अनुज्ञापन प्राधिकारी की लिखित पूर्व मंजूरी के बिना नहीं किया जाएगा। मंजुर किए गए ऐसे परिवर्तनों को इस अनुज्ञप्ति से उपाबद्ध संशोधित नक्शों में दिखाया जाएगा।

No alteration shall be carried out in the installation without the previous sanction in writing of the licensing authority. Such alterations so sanctioned shall be shown on an amended plan to be attached to this licence.

13. यदि अनुज्ञापन प्राधिकारी को लिखित में नोटिस देकर अनुज्ञप्त परिसरों में कोई ऐसी मरम्मत कराने की जो उसकी राय में परिसरों की सुरक्षा के लिए आवश्यक है, अनुज्ञप्तिधारी से अपेक्षा करता है तो यह ऐसी अवधि के भीतर जैसी की सूचना में नियत की जाए तथा जो ऐसी सूचना प्राप्त होने की तारीख से एक मास से कम नहीं होगी, मरम्मत कराएगा।

If the licensing authority calls upon the holder of a licence, by a notice in writing to execute any repairs to the storage shed, which are, in the opinion of such authority necessary for the safety of the premises, the holder of the licence shall execute the repairs within such period not being less than one months from the date of receipt of the notice, as may be fixed by the notice.

14. नियम 118 में निर्दिष्ट उत्तरदायी अभिकर्ता या पर्यवेक्षक किसी व्यक्ति को ऐसे टैंक में, जिसमें पेट्रोलियम हो, प्रवेश करने की तबतक अनुज्ञा नहीं देगा जब तक कि :

(क) ऐसा व्यक्ति मुख्य नियंत्रक द्वारा अनुमोदित प्रकार का अनुमोदित श्वसन साधित्र नहीं पहन लेता, या

(i) उत्तरदायी अभिकर्ता या पर्यवेक्षक टैंक के उसके द्वारा स्वयं या किसी अन्य सक्षम व्यक्ति द्वारा परिक्षण के परिणामस्वरुप पर लिखित (ओ.आई.एस.डी. मानक 105 में दिए गए विहित प्रारुप में यह प्रमाणित नहीं कर देता की टैंक के अंदर का वायुमंडल व्यक्तियों के प्रवेश के लिए ठिक है, तथा)

(ii) उस टैंक के, जिसकी सफाई या मरम्मत की जा रही है, मेन होल पर तुरत प्रयोग के लिए मुख्य नियंत्रक द्वारा अनुमोदित नमुने का कम से कम एक अनुमोदित श्वसन साधित्र तैयार नहीं रखा गया है।

इस शर्त के खण्ड (ख) के उपखण्ड (i) में निर्दिष्ट प्रमाणपत्र अनुज्ञापत्र परिसर में तीन मास तक परिरक्षित रखे जाएंगे।

The responsible agent or supervisor referred to in rule 118 shall not allow any person to enter a tank, which has contained petroleum unless -

(a) Such person wearan approved breathing ap paratus of a description approved by the Chief Controller, or

(b) (i) The responsible agent or supervisor has certified in writing in prescribed proforma given in OISD standard 105, asthe result of an examination of the tank by himself or by some other competent person that the atmosphere in the tank is fit for the person to enter and

(ii) Atleast one person wear an approved breathing apparatus of a pattern approved by the Chief Controller shall have been ready for instant use at the manhole of the tank which is being cleaned or repaired.

The certificate referred to in sub-clause (i) of cl. (b) ofthis condition shall be preserved in the licenced premises for a period on three months.

15. किसी टैंक में या उस पर अथवा ऐसे टैंक और किसी भवन या चौहदी के बीच रखी जाने वाली सुरक्षित दूरी के भीतर कोई ऐसा कार्य जिसमे अग्नि का प्रयोग झलाई या गर्म कर के रिवेटिंक लगाना सम्मिलित हो, तब तक नही किया जाएगा जब तक की शर्त 14 के खण्ड (ख) में अधिकथित रिती से टैंक को ओ.आई.एस.डी. मानक 105 में दिए गए प्रोफार्मा में पेट्रोलियम वाष्प से मुक्त प्रमाणित नही कर दिया जाए। जब टैंक में जल–पम्प किया जाता है या उसमें से जल निकाला जाता है तब उपर बनाई गई प्रकृति का कोई कार्य आगे तब तक नही किया जाएगा जब तक की टैंक का परिक्षण पुन: नही कर लिया जाता और एक नया प्रमाणपत्र जारी नहीं कर दिया जाता। जब टैंक को सफाई या मरम्मत के लिए खोला जाए तब किसी भी प्रकार का कोई लैम्प चाहे वह साधारण हो या विद्युत, विद्युत टार्चो, विद्यु केबल या ज्वालसह से भिन्न पंखे या आन्तरिक रुप से सुरक्षित प्रकार के पखों से भिन्न पंखे टैंक के निकट नही जाए जाएंगे।

No work involving the use of fire, welding or hot reveting, shall be performed in or on any tank or within the safety distance required to be observed from such tanks by building and boundary until the tank has been certified in pre scribed proforma givenin OISD Standard 105 in the manner laid down in clause (b) of condition 14to be free from petroleum vapour. When any water is pumped into or withdrawn from the tank no further work of above description shall be done until the tank has been retested and a fresh certificate issued. When a tank is opened for cleaning and repairs, no lamp of any description either ordinary or electric, electric torches, electric cables orfans other than of a flameproof or intrinsicallysafe type approved by the Chief Controller shall be rought near tank.

16. कोइ व्यक्ति, यदि उसकी जानकारी में उस पात्र में कोई पेट्रोलियम है या रखा गया है, किसी पात्र की मरम्मत तब तक नही करेगा या कराएगा जब तक कि उसने यह सुनिश्चित करने के लिए सभी युक्तियुक्त पूर्वाधानियां न बरती हो की वह पात्र या पाईप ऐसे पेट्रोलियम और हर ज्वलनशील वाष्प से मुक्त किया जा चुका है :

No person shall repair or cause to be repaired any reeceptacle or pipe in which to his knowledge, any petroleum is or has been kept until he has taken all reasonable precautions to ensure that the receptacles or pipe has been rendered free from petroleum and any inflammable vapour.

17 ऐसे सभी रिक्त पात्र जिनमें वर्ग क का पेट्रोलियम रखा गया हो, सिवाय वहां के जब उन्हे साफ करने के लिए और पेट्रोलियम वाष्प से मुक्त करने के प्रयोजन के लिए खोला जाता है, तब तक भीली भांति बन्द रखे जायेंगे जब तक की उन्हें पूरी तरह साफ नही कर दिया जाता और ज्वलनशील वाष्प से मुक्त नहीं कर दिया गया है।

All empty receptacles which have contained petroleum Class A shall except when they are opened for the purpose of cleaning them and rendering them free from petroleum vapour, be kept securely closed unless they have been thoroughly cleaned and freed from petroleum and inflammable vapur.

18. (क) आग या विस्फोट से दुर्घटना के निवारण के लिए सभी समयों पर यथेष्ट पूर्वासावधानियां बरती जायेंगी।
(ख) जहां कही मुख्य नियंत्रक द्वारा ऐसा विनिर्दिष्ट किया जाए वहां भंडारकरण टैंकों में अनुमोदित अग्नि फोन और/या जल छिडकव वाले सलग्नी, जो सभी समयों पर समुचित व्यवस्था में रखे जायेगें फिट किये जायेंगे।

(a) Adequateprecautions shall be taken at all times for the prevention of accident by fire or explosion.

(b) Wherever so specified by the Chief Controller, storage tanks shall be fitted with approved fire foam and/or water sprinkler attachments which shall be maintained in proper order at all times.

19. किसी भी पेट्रोलियम के किसी नाली, सीवर, बन्दरगाह, नदी, जल सरणी या सार्वजनिक सडक पर बह निकलने के निवारण के लिए हर सावधानी बरती जाएगी और अहातों या कुंडों को किसी नाली या सीवर के सात स्थायी रुप से नही जोडा जाना चाहिए।

Every care shall be taken to prevent any petroleum escaping into any drain, sewer, harbuor, river, water course or a public road and enclosures or sumps must not be permanently connected with any drain or sew er.

20. अनुज्ञप्तिधारी पेट्रोलियम की सभी प्राप्तियों और निर्गमों के दैनिक अभिलेख और लेखे ऐसे प्ररुप में रखेगा जैसे की अनुज्ञापन प्राधिकारी द्वारा समय–समय पर विहित किये जायें और अपने स्टॉक को और अभिलेखों को निरीक्षक या नमूना लेने वाले अधिकारी को मांग किये जाने पर दिखाएगा।

The licencee shall keep daily records and accounts of all receipts and issues of petroleum in such form as the licensing authority may from time to time prescribe and shall exhibit his stock and records to an inspector or sampling officer on demand.

21. अनुज्ञप्ति परिसरों में विनिर्दिष्ट क्षेत्र के भीतर आग या विस्फोट से होने वाली किसी भी दुर्घटना की रिपोर्ट जिसमें मानव जीवन की क्षति हुई या व्यक्ति या सम्पत्ति को गम्भीर क्षति हुई है, निकटतम मजिस्ट्रेट को या निकटतम पुलिस थाने के भारसाधक को की जाएगी और मुख्य विस्फोटक नियंत्रक निकटतम को भी, अविलम्ब तार द्वारा भी (तार का पता "विस्फोटक, नागपुर") दी जाएगी।

Any accident, fire or explosion occurring in the licenced premises, which is attended with loss of human life or serious injury to person or property shall be immediately reported to the nearest Magistrate or to the officer-in-charge of the nearest police station and by telegram to the Chief Controller (Telegraphic address "Explosives, Nagpur").

22. निरीक्षक या नमूना लेने वाले अधिकारी को सभी युक्तियुक्त समयों पर अनुज्ञप्त परिसरों में निर्बाध रुप से प्रवेश करने दिया जाएगा और ऐसे अधिकारी को, यह अभिनिश्चित करने के लिए की नियमों और इस अनुज्ञप्ति की शर्तो का सम्यक रुप से अनुपालन हो रहा है या नही, हर सुविधा प्रदान की जाएगी।

Fees access to the licensed premises shall be given at all reasonable times to any inspector or sampling officer and every facility shall be afforeded to such officer for ascertaining that rules and the conditions of this licence are duly observed.

अतिरिक्त शर्त

ADDITIONAL CONDITION

जहां विस्फोटक का निर्माण, उपयोग तथा भंडारकरण किया जाता है ऐसे परिसर के अंदर या आसपास में कोई भी इलेक्ट्रानिक उपकरण या यंत्र जैसे मोबाईल, फोन, पेजर को रखने की इजाजत नही है।

No electronic appliances or instruments like mobile phones, pagers shall be allowed in or near the premises where explosives are manufactured handled, stored and used.

भारत सरकार/Government of India
वाणिज्य और उद्योग मंत्रालय/Ministry of Commerce & Industry
पेट्रोलियम तथा विस्फोटक सुरक्षा संगठन (पैसो) /Petroleum & Explosives Safety Organisation (PESO)
9वीं मंजिल, पार्क पैराडाइज, वडसर,
वडोदरा- 390012
9th Floor, Park Paradise,
Vadsar,
Vadodara - 390012

ई-मेल:/E-mail :
jtcce.vadodara@explosives.gov.in
फोन / फ़ैक्स नंबर:/Phone/Fax No : **0265 - 2361035**

अनुज्ञप्ति सं./No : S/HO/GJ/03/1823(S73090) दिनांक/Dated : **20/07/2024**

सेवा में/To,

M/s. M/s. Gujarat Fluorochemicals Ltd.,
12/A GIDC Dahej Industrial Estate,
Vagra,
Taluka: Vagra,
District: BHARUCH,
State: Gujarat
PIN: 392130

विषय :/Sub : Plot No, 12/A (Installation -II), GIDC Industrial Estate, GIDC Industrial Estate, Dahej Vagra, Vagra, Taluka: Vagra, District: BHARUCH, State: Gujarat, PIN: 391230 स्थित R 142b, गैस के संपीडित पात्र / पात्रों में भंडारण के लिए स्थिर एवं गतिशील दाब पात्र (अज्वलित) नियम, 2016 के अधीन स्वीकृत अनुज्ञप्ति संख्या S/HO/GJ/03/1823 के नवीनीकरण संबंध में /Storage of NR 142b gas in pressure vessels at Plot No, 12/A (Installation -II), GIDC Industrial Estate, GIDC Industrial Estate, Dahej Vagra, Vagra, Taluka: Vagra, District: BHARUCH, State: Gujarat, PIN: 391230 - Licence No : S/HO/GJ/03/1823 grant in form LS-1A of SMPV(U) Rules, 2016-Renewal of Licence Regarding

महोदय/Sir(s),

कृपया आपके दिनांक : 04/07/2024 के पत्र संख्या: **OIN1665453** का संदर्भ ग्रहण करें ।/Please refer to your application No.**OIN1665453** dated 04/07/2024 .

अनुज्ञप्ति संख्या : **S/HO/GJ/03/1823** का नवीकरण दिनांक 30th सितंबर 2029 तक कर इसके साथ अग्रेषित की जा रही हैं ।
Licence Number: **S/HO/GJ/03/1823** is renewed and is valid upto **30th September 2029** is forwarded herwith.

दिनांक 30/09/**2029** . से आगे अनुज्ञप्ति नवीनीकरण हेतु उपरोक्त नियम के नियम 55 के प्रावधानों का पालन किया जाएं । विलंब शुल्क से बचने हेतु शुल्क के साथ मूल अनुज्ञप्ति तथा अन्य दस्तावेज अधिकतम दिनांक : 30 सितंबर, **2029** तक **The Jt. Chief Controller of Explosives, Vadodara Circle, Vadodara** में जरूर पहुंच जाने चाहिए ।
The provisions of the Rule 55 of the above said rules shall be followed for further renewal of the licence beyond 30/9/**2029**. The renewal application along with fees, Original licence and other documents shall reach in the Office of **The Jt. Chief Controller of Explosives, Vadodara Circle, Vadodara**, latest by 30th September,**2029** to avoid late fee.

कृपया अनुज्ञप्ति प्राप्ति की पावती दें ।/Please acknowledge the receipt of the licence.

भवदीय/Yours faithfully,

((के.पी.शर्मा)
(K. P. SHARMA))
उप मुख्य विस्फोटक नियंत्रक
Dy. Chief Controller of Explosives
कृते संयुक्त मुख्य विस्फोटक नियंत्रक
For Jt. Chief Controller of Explosives
वडोदरा/Vadodara

(अधिक जानकारी जैसे आवेदन की स्थिति, शुल्क तथा अन्य विवरण के लिए हमारी वेबसाइट : http://peso.gov.in देखें)

900

(For more information regarding status,fees and other details please visit our website http://peso.gov.in)

Note:-This is system generated document does not require signature.

Digitally signed by K P SHARMA
Reason: Licence No. : S/HO/GJ/03/1823
Location:Vadodara [S73090]
Date:20-07-2024 14:20:13 PM

901

भारत सरकार/Government of India
वाणिज्य और उद्योग मंत्रालय/Ministry of Commerce & Industry
पेट्रोलियम तथा विस्फोटक सुरक्षा संगठन (पैसो) /Petroleum & Explosives Safety Organisation (PESO)
9वीं मंजिल, पार्क पैराडाइज, वडसर
वडोदरा- 390012
9th Floor, Park Paradise,
Vadsar,
Vadodara - 390012

ईमेल/E-mail :
jtcce.vadodara@explosives.gov.in
फोन / फ़ैक्स नंबर:/Phone/Fax No : **0265 - 2361035**

संख्या/No : S/HO/GJ/03/2528(S104643) दिनांक/Dated : **01/04/2024**

To,

M/s. Gujarat Fluorochmicals Limited,
12/A, GIDC Dahej Industrial Estate, Taluka Vagra,,
12/A, GIDC Dahej Industrial Estate, Taluka Vagra,,
Ambheta,
Bharuch,
Taluka: Vagra,
District: BHARUCH,
State: Gujarat
PIN: 392130

विषय/Sub : **Plot No, 12/A, GIDC Dahej Industrial Estate,, Ambheta, Vagra, Taluka: Vagra, District: BHARUCH, State: Gujarat, PIN: 392130 स्थित R-125, गैस के संपीडित पात्र / पात्रों में भंडारण के लिए स्थिर एवं गतिशील दाब पात्र (अज्वलित) नियम, 2016 के अधीन स्वीकृत अनुज्ञप्ति संख्या S/HO/GJ/03/2528 अनुज्ञप्ति निरीक्षण एवं पृष्ठांकन के बारे में/Storage of R-125 gas in pressure vessels at Plot No, 12/A, GIDC Dahej Industrial Estate,, Ambheta, Vagra, Taluka: Vagra, District: BHARUCH, State: Gujarat, PIN: 392130 - Licence No : S/HO/GJ/03/2528 grant in form LS-1A of SMPV(U) Rules, 2016-Endorsement of Licence Regarding**

महोदय/Sir(s),

कृपया **Chief Controller of Explosives Nagpur's** के ज्ञापन सं **S/HO/GJ/03/2528 (S104643)** दिनांक **14/07/2023** का संदर्भ और अधोहस्ताक्षकर्ता/ कार्यालय के अधिकारी द्वारा उपरोक्त परिसरों के किए गए निरीक्षण दिनांक **19/09/2023** का संदर्भ ग्रहण करें/ Please refer to the **Chief Controller of Explosives Nagpur's** Memo No. **S/HO/GJ/03/2528 (S104643)** Dated **14/07/2023** and inspection of the above premises by an officer of this Department on **19/09/2023** .

इस विषय लाइसेंस के साथ इसे पृष्ठांकन किया जाता है। लाइसेंस की प्राप्ति कृपया स्वीकार कर लें।/The subject licence is forwarded herewith duly endorsed. The receipt of the licence may please be acknowledged.

देर शुल्क से बचने के लिए एसएमपीवी (यू) नियम, 2016 के नियम 55 के अंतर्गत अनुज्ञप्ति के पुनः नवीकरण हेतु आवेदन, इस कार्यालय को इस अनुज्ञप्ति की वैधता समाप्त होने के पूर्व (दिनांक 30 सितम्बर **2028** को या इससे पूर्व) जमा कर दें |/ Please note that your application for further renewal shall reach this office on or before 30th September, 2028 along with all the documents required under Rule 55 of the SMPV(U) Rules, 2016 to avoid late fee.

भवदीय/Yours faithfully,

((आर.वेणुगोपाल)
(Dr. R.Venugopal))
संयुक्त मुख्य विस्फोटक नियंत्रक
Jt. Chief Controller of Explosives
वडोदरा/Vadodara

(For more information regarding status,fees and other details please visit our website http://peso.gov.in)

Note:-This is system generated document does not require physical signature.

Digitally signed by DR R VENUGOPAL
Reason: Licence No. : S/HO/GJ/03/2528
Location:Vadodara [S104643]
Date:01-04-2024 13:25:07 PM

भारत सरकार/Government of India
वाणिज्य और उद्योग मंत्रालय/Ministry of Commerce & Industry
पेट्रोलियम तथा विस्फोटक सुरक्षा संगठन (पैसो) /Petroleum & Explosives Safety Organisation (PESO)
आंठवी मंजिल, यश कमल बिल्डींग, सयाजी गंज
वडोदरा - 390020
8th Floor, Yash Kamal Building, Sayajigunj,
Vadodara - 390020

ई-मेल:/E-mail : dyccebaroda@explosives.gov.in
फोन / फैक्स नंबर:/Phone/Fax No : 0265 - 2225159

अनुज्ञप्ति सं./No : S/HO/GJ/03/1778(S73093) दिनांक/Dated : 25/09/2020

सेवा में/To,

M/s. Gujarat Fluorochemicals Ltd.,
12/A GIDC Dahej Industrial Estate,
Vagra,
Bharuch,
Taluka: Vagra,
District: BHARUCH,
State: Gujarat
PIN: 392130

01 OCT 2020

विषय :/Sub : Plot No, 12/A, GIDC INDUSTRIAL ESTATE, DAHEJ, VAGRA, District: BHARUCH, State: Gujarat, PIN: 392130 स्थित VINYLIDENE FLUORIDE (VDF), गैस के संपीडित पात्र / पात्रों में भंडारण के लिए स्थिर एवं गतिशील दाब पात्र (अज्वलित) नियम, 2016 के अधीन स्वीकृत अनुज्ञप्ति संख्या S/HO/GJ/03/1778 के नवीनीकरण संबंध में /Storage of NVINYLIDENE FLUORIDE (VDF) gas in pressure vessels at Plot No, 12/A, GIDC INDUSTRIAL ESTATE, DAHEJ, VAGRA, District: BHARUCH, State: Gujarat, PIN: 392130 - Licence No : S/HO/GJ/03/1778 grant in form LS-1A of SMPV(U) Rules, 2016-Renewal of Licence Regarding

महोदय/Sir (s),

कृपया आपके दिनांक : 03/09/2020 के पत्र संख्या: **OIN558063** का संदर्भ ग्रहण करें ।/Please refer to your application No.**OIN558063** dated 03/09/2020 .

अनुज्ञप्ति संख्या : **S/HO/GJ/03/1778** का नवीकरण दिनांक 30th सितंबर 2025 तक कर इसके साथ अग्रेषित की जा रही हैं ।
Licence Number: **S/HO/GJ/03/1778** is renewed and is valid upto **30th September 2025** is forwarded herwith.

दिनांक 30/09/**2025** . से आगे अनुज्ञप्ति नवीनीकरण हेतु उपरोक्त नियम के नियम 55 के प्रावधानों का पालन किया जाएं । विलंब शुल्क से बचने हेतु शुल्क के साथ मूल अनुज्ञप्ति तथा अन्य दस्तावेज अधिकतम दिनांक : 30 सितंबर, **2025** तक **The Dy. Chief Controller of Explosives, Vadodara** में जरूर पहुंच जाने चाहिए ।
The provisions of the Rule 55 of the above said rules shall be followed for further renewal of the licence beyond 30/9/**2025**. The renewal application along with fees, Original licence and other documents shall reach in the Office of **The Dy. Chief Controller of Explosives, Vadodara**, latest by 30th September,**2025** to avoid late fee.
कृपया अनुज्ञप्ति प्राप्ति की पावती दें ।/Please acknowledge the receipt of the licence.

भवदीय/Yours faithfully,

(()
(Mohanlal Jana))

Dy. Controller of Explosives
कृते उप मुख्य विस्फोटक नियंत्रक
For Dy. Chief Controller of Explosives
वडोदरा/Vadodara

(For more information regarding status,fees and other details please visit our website http://peso.gov.in)

FORM LS-1A/फ़रुप - एलएस-1क
(See Rules 50, 51, 54 and 55)/(नियम 50 , 51, 54 और 55 देखें)

Licence to Store Compressed gas in pressure vessel or vessels
दाब पात्र या पात्रों में संपीड़ित गैस भण्डारकरण के लिए अनुज्ञप्ति

अनुज्ञप्ति सं/Licence No. : **S/HO/GJ/03/1778(S73093)** फीस रुपए/Fee Rs. **50000/-** per year/प्रति वर्ष

Licence is hereby granted to M/s. Gujarat Fluorochemicals Ltd., 12/A GIDC Dahej Industrial Estate ,Vagra,Bharuch, Taluka: Vagra, District: BHARUCH , State: Gujarat PIN: 392130 valid only for the storage of compressed gas in 1 Number(s) of pressure vessels as indicated below in the licensed premises described below and shown in the plan No.S/HO/GJ/03/1778(S73093) dated 25/09/2020 subject to the provisions of the Indian Explosives Act, 1884 (4 of 1884) and the rules made thereunder and to the further conditions of this licence.

श्री M/s. Gujarat Fluorochemicals Ltd., 12/A GIDC Dahej Industrial Estate ,Vagra,Bharuch, Taluka: Vagra, District: BHARUCH , State: Gujarat PIN: 392130 को नीचे वर्णित अनुज्ञप्त परिसरों में और रेखांकन संख्या S/HO/GJ/03/1778(S73093) dated 25/09/2020 में भारतीय विस्फोटक अधिनियम, 1884 (1884 का 4) और उसके अधीन बनाए गए नियमों तथा इस अनुज्ञप्ति की अन्य शर्तों पर 1 दाब पात्र / पात्रों में संपीड़ित गैस के भण्डारण के लिए अनुज्ञप्ति मंजूर की जाती है।

यह अनुज्ञप्ति 30 सितंबर 2025 तक प्रवृत्त रहेगी।

The Licence shall remain in force till the **30th September2025.**

Vessel No./वेसल नंबर	Name of Gas/गैस का नाम	State of Gas/गैस की स्थिति	Water Capacity in cubic meter/जल क्षमता (घ.मी.)	Max. working Pre. (kg/cm^2)/अधिकतम वर्किंग प्रेशर	Quantity Granted in kgs(Liquified gas)/किलोग्रॅम में जारी मात्रा (लिक्विफाईड गैसेस)
1011622003/1	VINYLIDENE FLUORIDE (VDF)	Liquified	39.00	12.24	36680
Total Water capacity			39.00		

March 22, 2017

For Chief Controller of Explosives
HQ, Nagpur
कृते मुख्य विस्फोटक नियंत्रक
नागपुर

DESCRIPTION AND LOCATION OF THE LICENSED PREMISES/अनुज्ञप्त परिसर का विवरण और अवस्थिती

The licensed premises, the layout boundaries and other particulars of which are shown in the attached approved plan No. S/HO/GJ/03/1778 dated 25/09/2020 are situated at DAHEJ, VAGRA and consists of 1 Number(s) vessel(s) for storage of :/अनुज्ञप्त परिसर, प्रदर्शित सीमा और अन्य विवरण जो संलग्न अनुमोदित रेखाचित्र क्र.S/HO/GJ/03/1778 दिनांक 25/09/2020 में दर्शाए गए है DAHEJ, VAGRA पर स्थित है और इसमे 1 वेसल सम्मिलित है।

a) Flammable/Corrosive/Toxic Gases :/ज्वलनशील / संक्षारक / विषैली गैसों: VINYLIDENE FLUORIDE (VDF)

b) Non-Toxic Gases :/अविषैली गैसों :

and is situated at PlotNo : 12/A Village/Town :DAHEJ, VAGRA Police Station : DAHEJ District : BHARUCH, State: Gujarat , Pin : 39.
/प्लाट संख्या PlotNo : 12/A गांव या नगर :DAHEJ, VAGRA पुलीस थाना DAHEJ जिला BHARUCH राज्य Gujarat , Pin : 39 में स्थित है।

SPACE FOR ENDORSEMENT OF RENEWALS/नवीकरण के पृष्ठांकन के लिए स्थान

	Date of Renewal/नवीकरण की तारीख	Date of Expiry/अनुज्ञप्ति की समाप्ति की तारीख	Signature and stamp of the licensing authority/अनुज्ञापन प्राधिकारी के हस्ताक्षर और कार्यालय की मुद्रा
This licence shall be renewable without any concession in fee for three years in the absence of contravention of the provision of the Indian Explosives Act, 1884, or the Static and Mobile Pressure Vessles (Unfired) Rules,2016, framed thereunder or of the conditions of the licence /अनुज्ञप्ति, भारतीय विस्फोटक अधिनियम, 1884 या उसके अधीन अधीन बनाए गए स्थिर एवं गतिशील दाब पात्र (अज्वलित) नियम, 2016 या इस अनुज्ञप्ति की शर्तों का उल्लंघन न होने की दशा में, फीस में बिना किसी छूट के तीन वर्ष तक नवीकृत की जाएगी।	25/09/2020	30/09/2025	Mohanlal Jana DCE For Dy. Chief Controller of Explosives Vadodara. उप मुख्य विस्फोटक नियंत्रक, वडोदरा Dy. Chief Controller of Explosives, Vadodara

This licence is liable to be cancelled if the licenced premises are not found conforming to the description and conditions attached hereto and contravention of any of the rules and conditions under which this licence is granted and the holder of this licence is also punishable with imprisonment for the term which may extend to two years or with fine which may extend to three thousand rupees or with both./यदि निरीक्षण के समय अनुज्ञप्त परिसर इससे उपाबद्ध विवरण और शर्तों के अनुरुप नहीं पाया जाता है और जिन नियमों और शर्तों के अधीन यह अनुज्ञप्ति मंजूर की गई है, उनमे से किसी का उल्लंघन होता है तो उस दशा में यह अनुज्ञप्ति रद्द की जा सकती है और अनुज्ञप्ति का धारक कारावास से, जिसकी अवधि दो वर्ष तक की हो सकेगी, या जुर्माने से, जो तीन हजार रुपये तक का हो सकेगा, या दोनों से दण्डनीय भी होगा।

भारत सरकार/Government of India
वाणिज्य और उद्योग मत्रालय/Ministry of Commerce & Industry
पेट्रोलियम तथा विस्फोटक सुरक्षा संगठन (पैसो) /Petroleum & Explosives Safety Organisation (PESO)
आंठवी मंजिल, यश कमल बिल्डींग, सयाजी गंज
वडोदरा - 390020
8th Floor, Yash Kamal Building, Sayajigunj,
Vadodara - 390020

ई-मेल:/E-mail : dyccebaroda@explosives.gov.in
फोन / फैक्स नंबर:/Phone/Fax No : 0265 - 2225159

अनुज्ञप्ति सं./No : S/HO/GJ/03/953(S31114) दिनांक/Dated : 25/09/2020

सेवा में/To,

M/S. GUJARAT FLUOROCHEMICALS LIMITED,,
12/A~ GIDC DAHEJ INDUSTRIAL AREA,,
DAHEJ TAL VAGRA,
Vagra,
Bharuch,
Taluka: Bharuch,
District: BHARUCH,
State: Gujarat
PIN: 392130

01 OCT 2020

विषय :/Sub : Plot No, Plot No. 12A, GIDC Estate Area,, DAHEJ TAL VAGRA, District: BHARUCH, State: Gujarat, PIN: 392130 स्थित Hexafluoropropylene (HFP),R-125,R-22(Chlorodifluoromethane), गैस के संपीडित पात्र / पात्रों में भंडारण के लिए स्थिर एवं गतिशील दाब पात्र (अज्वलित) नियम, 2016 के अधीन स्वीकृत अनुज्ञप्ति संख्या S/HO/GJ/03/953 के नवीनीकरण संबंध में /Storage of NHexafluoropropylene (HFP),R-125,R-22(Chlorodifluoromethane) gas in pressure vessels at Plot No, Plot No. 12A, GIDC Estate Area,, DAHEJ TAL VAGRA, District: BHARUCH, State: Gujarat, PIN: 392130 - Licence No : S/HO/GJ/03/953 grant in form LS-1A of SMPV(U) Rules, 2016-Renewal of Licence Regarding

महोदय/Sir (s),

कृपया आपके दिनांक : 04/09/2020 के पत्र संख्या: **OIN554597** का संदर्भ ग्रहण करें /Please refer to your application No.**OIN554597** dated 04/09/2020 .

अनुज्ञप्ति संख्या : **S/HO/GJ/03/953** का नवीकरण दिनांक 30th सितंबर 2025 तक कर इसके साथ अग्रेषित की जा रही हैं ।
Licence Number: **S/HO/GJ/03/953** is renewed and is valid upto **30th September 2025** is forwarded herwith.

दिनांक 30/09/**2025** . से आगे अनुज्ञप्ति नवीनीकरण हेतु उपरोक्त नियम के नियम 55 के प्रावधानों का पालन किया जाएं । विलंब शुल्क से बचने हेतु शुल्क के साथ मूल अनुज्ञप्ति तथा अन्य दस्तावेज अधिकतम दिनांक : 30 सितंबर, **2025** तक **The Dy. Chief Controller of Explosives, Vadodara** में जरूर पहुंच जाने चाहिए ।
The provisions of the Rule 55 of the above said rules shall be followed for further renewal of the licence beyond 30/9/**2025**. The renewal application along with fees, Original licence and other documents shall reach in the Office of **The Dy. Chief Controller of Explosives, Vadodara**, latest by 30th September,**2025** to avoid late fee.

कृपया अनुज्ञप्ति प्राप्ति की पावती दें ।/Please acknowledge the receipt of the licence.

भवदीय/Yours faithfully,

(()
(Mohanlal Jana))

Dy. Controller of Explosives
कृते उप मुख्य विस्फोटक नियंत्रक
For Dy. Chief Controller of Explosives
वडोदरा/Vadodara

(For more information regarding status,fees and other details please visit our website http://peso.gov.in)

FORM LS-1A/प्ररुप - एलएस–1क
(See Rules 50, 51, 54 and 55)/(नियम 50 , 51, 54 और 55 देखें)
Licence to Store Compressed gas in pressure vessel or vessels
दाब पात्र या पात्रों में संपीड़ित गैस भण्डारकरण के लिए अनुज्ञप्ति

अनुज्ञप्ति सं/Licence No. : S/HO/GJ/03/953(S31114) फीस रुपए/Fee Rs. 50000/- per year/प्रति वर्ष

Licence is hereby granted to M/S. GUJARAT FLUOROCHEMICALS LIMITED,, 12/A~ GIDC DAHEJ INDUSTRIAL AREA,, DAHEJ TAL VAGRA ,Vagra,Bharuch, Taluka: Bharuch, District: BHARUCH , State: Gujarat PIN: 392130 valid only for the storage of compressed gas in 4 Number(s) of pressure vessels as indicated below in the licensed premises described below and shown in the plan No.S/HO/GJ/03/953(S31114) dated 02/06/2017 subject to the provisions of the Indian Explosives Act, 1884 (4 of 1884) and the rules made thereunder and to the further conditions of this licence.
श्री M/S. GUJARAT FLUOROCHEMICALS LIMITED,, 12/A~ GIDC DAHEJ INDUSTRIAL AREA,, DAHEJ TAL VAGRA ,Vagra,Bharuch, Taluka: Bharuch, District: BHARUCH , State: Gujarat PIN: 392130 को नीचे वर्णित अनुज्ञप्त परिसरों में और रेखांकन संख्या S/HO/GJ/03/953(S31114) dated 02/06/2017 में भारतीय विस्फोटक अधिनियम, 1884 (1884 का 4) और उसके अधीन बनाए गए नियमों तथा इस अनुज्ञप्ति की अन्य शर्तों पर 4 दाब पात्र / पात्रों में संपीड़ित गैस के भण्डारण के लिए अनुज्ञप्ति मंजूर की जाती है।
यह अनुज्ञप्ति 30 सितंबर 2025 तक प्रवृत रहेगी।
The Licence shall remain in force till the **30th September2025.**

Vessel No./वेसल नंबर	Name of Gas/गैस का नाम	State of Gas/गैस की स्थिति	Water Capacity in cubic meter/जल क्षमता (घ.मी.)	Max. working Pre. (kg/cm²)/अधिकतम वर्किंग प्रेशर	Quantity Granted in kgs(Liquified gas)/किलोग्रॅम में जारी मात्रा (लिक्विफाईड गैसेस)
T-1 (V 632 A)	R-22 (Chlorodifluoromethane)	Liquified	80.00	12	80400
T-2 (V 632 B)	R-22 (Chlorodifluoromethane)	Liquified	80.00	12	80400
V-632	Hexafluoropropylene (HFP)	Liquified	80.00	11.1	86488
UF-497 (V-6847)	R-125	Liquified	40.00	21.0	36100
Total Water capacity			280.00		

May 25, 2007

For Chief Controller of Explosives
HQ, Nagpur
कृते मुख्य विस्फोटक नियंत्रक
नागपुर

1). Amendment dated - 13/07/2011
2). Amendment dated - 12/10/2012
3). Amendment dated - 02/06/2017

DESCRIPTION AND LOCATION OF THE LICENSED PREMISES/अनुज्ञप्त परिसर का विवरण और अवस्थिती

The licensed premises, the layout boundaries and other particulars of which are shown in the attached approved plan No. S/HO/GJ/03/953 dated 02/06/2017 are situated at DAHEJ TAL VAGRA and consists of 4 Number(s) vessel(s) for storage of :/अनुज्ञप्त परिसर, प्रदर्शित सीमा और अन्य विवरण जो संलग्न अनुमोदित रेखाचित्र क्र.S/HO/GJ/03/953 दिनांक 02/06/2017 में दर्शाए गए है DAHEJ TAL VAGRA पर स्थित है और इसमे 4 वेसल सम्मिलित है।

a) Flammable/Corrosive/Toxic Gases :/ज्वलनशील / संक्षारक / विषैली गैसों:

b) Non-Toxic Gases :/अविषैली गैसों : R-22(Chlorodifluoromethane), R-125, Hexafluoropro

and is situated at PlotNo : Plot No. 12A Village/Town :DAHEJ TAL VAGRA Police Station : Vagra District : BHARUCH, State: Gujarat , Pin : 39.
/प्लॉट संख्या PlotNo : Plot No. 12A गांव या नगर :DAHEJ TAL VAGRA पुलीस थाना Vagra जिला BHARUCH राज्य Gujarat , Pin : 39 में स्थित है।

SPACE FOR ENDORSEMENT OF RENEWALS/नवीकरण के पृष्ठांकन के लिए स्थान

	Date of Renewal/नवीकरण की तारीख	Date of Expiry/अनुज्ञप्ति की समाप्ति की तारीख	Signature and stamp of the licensing authority/अनुज्ञापन प्राधिकारी के हस्ताक्षर और कार्यालय की मुद्रा
This licence shall be renewable without any concession in fee for three years in the absence of contravention of the provision of the Indian Explosives Act, 1884, or the Static and Mobile Pressure Vessles (Unfired) Rules,2016, framed thereunder or of the conditions of the licence./अनुज्ञप्ति, भारतीय विस्फोटक अधिनियम, 1884 या उसके अधीन अधीन बनाए गए स्थिर एवं गतिशील दाब पात्र (अज्वलित) नियम, 2016 या इस अनुज्ञप्ति की शर्तों का उल्लंघन न होने की दशा में, फीस में बिना किसी छूट के तीन वर्ष तक नवीकृत की जाएगी।	25/09/2020	30/09/2025	Mohanlal Jana DCE For Dy. Chief Controller of Explosives Vadodara उप मुख्य विस्फोटक नियंत्रक, वडोदरा Dy. Chief Controller of Explosives, Vadodara

This licence is liable to be cancelled if the licenced premises are not found conforming to the description and conditions attached hereto and contravention of any of the rules and conditions under which this licence is granted and the holder of this licence is also punishable with imprisonment for the term which may extend to two years or with fine which may extend to three thousand rupees or with both./यदि निरीक्षण के समय अनुज्ञप्त परिसर इससे उपाबद्ध विवरण और शर्तों के अनुरुप नहीं पाया जाता है और जिन नियमों और शर्तों के अधीन यह अनुज्ञप्ति मंजूर की गई है, उनमे से किसी का उल्लंघन होता है तो उस दशा में यह अनुज्ञप्ति रद्द की जा सकती है और अनुज्ञप्ति का धारक कारावास से, जिसकी अवधि दो वर्ष तक की हो सकेगी, या जुर्माने से, जो तीन हजार रुपये तक का हो सकेगा, या दोनों से दण्डनीय भी होगा।

भारत सरकार /Government of India
वाणिज्य और उद्योग मंत्रालय/Ministry of Commerce & Industry
पेट्रोलियम तथा विस्फोटक सुरक्षा संगठन /Petroleum & Explosives Safety Organisation (PESO)
आंठवी मंजिल, यश कमल बिल्डींग,सयाजी गंज
वडोदरा - 390020
8th Floor, Yash Kamal Building, Sayajigunj, Vadodara - 390020

इमेल /E-mail : **dyccebaroda@explosives.gov.in**
दूरभाष /Phone/Fax No : **0265 - 2225159**

सं/No : G/HO/GJ/05/688 & G/HO/GJ/06/678(G27680) दि/Dated : **12/11/2020**

सेवा में /To,

M/s Gujarat Fluorochemicals Ltd,
12/A, G I D C Dehaj Bharuch,,
BHARUCH
Bharuch,
Taluka: Vagra,
District: BHARUCH
State: Gujarat
Pin : 392130

विषय/Sub : **Plot No, 12A, GIDC Estate, BHARUCH, , District: BHARUCH, State: Gujarat, Pin : 999999में सिलण्डररों में Hexafluropropene(R-1216) गैस का भरण-एवं भण्डा5रण गोडाउन- गैस सिलेण्ड,र्स नियम, 2016 के अंतर्गत फार्म 'इ' एवं 'एफ' में जारी अनुज्ञप्ति सं. G/HO/GJ/05/688 & G/HO/GJ/06/678(G27680)** नवीकरण के बारे में / Filling of **Hexafluropropene(R-1216)** and Storage of **Hexafluropropene(R-1216)** at **Plot No, 12A, GIDC Estate, BHARUCH, , District: BHARUCH, State: Gujarat, Pin : 999999** Licence No. **G/HO/GJ/05/688 & G/HO/GJ/06/678(G27680)** granted in Form E & F of Gas Cylinders Rules, 2016 - Renewal regarding

महोदय/Sir(s),

कृपया आपके दि. **19/10/2020** के पत्र सं. **nil** का संदर्भ ग्रहण करें/ Please refer to your application No.**nil** dated **19/10/2020** .

अनुज्ञप्ति संख्या **G/HO/GJ/05/688 & G/HO/GJ/06/678** 30th Septemebr, 2030 तक नवीनीकृत कर भेजी जा रही है / Licence Number: **G/HO/GJ/05/688 & G/HO/GJ/06/678** is renewed and valid upto 30th Septemebr, 2030 is forwarded herewith.

कृपया नोट करें कि गैस सिलेण्डर नियम, 2016 के नियम 55(5) के अनुसार, अनुज्ञप्ति के पुनः नवीकरण हेतु आवेदन **The Dy. Chief Controller of Explosives, Vadodara** इस कार्यालय को इस अनुज्ञप्ति की वैधता समाप्त होने के पूर्व (दिनांक 30 सितम्बर**2030** को या इससे पूर्व) जमा कर दें । दिनांक 30 सितम्बर **2030** के पश्चात परंतु दिनांक 30 सितम्बर **2031** से पूर्व प्राप्त नवीनीकरण आवेदन, गैस सिलेण्डर नियम, 2016 के नियम 55(7) के अनुसार विलंब शुल्क के साथ ही विचाराधीन होगा । दिनांक 30 सितम्बर **2031** तक कोई नवीनीकरण आवेदन प्राप्त नही होने की स्थिति में यह अनुज्ञप्ति स्वतः निरस्त हो जाएगी । /Please note that application for renewal of the licence should be submitted so as to reach the **The Dy. Chief Controller of Explosives, Vadodara** before the licence expires (i.e. on or before 30th Septemebr, **2030**) as required under Rule 55(5) of Gas Cylinders Rules, 2016. Application for renewal of licence received after 30th Septemebr, **2030** but not later than 30th September, **2031** shall be considered only with late fee applicable vide Rule 55(7) (a)(b) of said Rules. The licence will automatically expire if no application is received upto 30th Septemebr, **2031** .

कृपया इस पत्र की प्राप्तिा की पावती दे/ Please acknowledge the receipt of the same.

भवदीय /Yours faithfully,

(()
(Mohanlal Jana))

Dy. Controller of Explosives
कृते उप मुख्य विस्फोटक नियंत्रक
For Dy. Chief Controller of Explosives
वडोदरा/Vadodara

[अधिक जानकारी जैसे आवेदन की स्थिति, शुल्कf तथा अन्यe विवरण के लिए कृपया हमारी वेबसाइट http://peso.gov.in देखें ।]
(For more information regarding status,fees and other details please visit our website http://peso.gov.in)

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वाणिज्य और उद्योग मंत्रालय/Ministry of Commerce & Industry
पेट्रोलियम तथा विस्फोटक सुरक्षा संगठन /Petroleum & Explosives Safety Organisation (PESO)
आठवी मंजिल, यश कमल बिल्डींग,सयाजी गज
वडोदरा- 390020
8th Floor, Yash Kamal Building, Sayajigunj, Vadodara - 390020

इमेल /E-mail : dyccebaroda@explosives.gov.in
दूरभाष /Phone/Fax No : 0265 - 2225159

स/No : G/HO/GJ/05/586 & G/HO/GJ/06/575(G22172)

दि/Dated : 18/10/2019

सेवा में /To,

M/S GUJARAT FLUOROCHEMICALS LIMITED,
12/A~ GIDC DAHEJ INDUSTRIAL ESTATE~,,
TAL.VAGRA
BHARUCH,
District: BHARUCH
State: Gujarat
Pin : 392130

21 OCT 2019

विषय/Sub : Plot No, 12A, GIDC Dahej Industrial Estate Ta Vagra, Dahej, , District: BHARUCH, State: Gujarat, Pin : 392130में सिलण्डरों में HYDROGEN गैस का भरण-एवं भण्डारिण सिलेण्डर- गैस सिलेण्डर्स नियम, 2016 के अंतर्गत फार्म 'ई' एवं 'एफ' में जारी अनुज्ञप्ति सं. G/HO/GJ/05/586 & G/HO/GJ/06/575 (G22172) नवीकरण के बारे में / Filling of HYDROGEN and Storage of HYDROGEN at Plot No, 12A, GIDC Dahej Industrial Estate Ta Vagra, Dahej, , District: BHARUCH, State: Gujarat, Pin : 392130 Licence No. G/HO/GJ/05/586 & G/HO/GJ/06/575 (G22172) granted in Form E & F of Gas Cylinders Rules, 2016 - Renewal regarding

महोदय/Sir (s),

कृपया आपके दि. 30/08/2019 के पत्र सं. nil का संदर्भ ग्रहण करें/ Please refer to your application No.nil dated 30/08/2019 .

अनुज्ञप्ति संख्या G/HO/GJ/05/586 & G/HO/GJ/06/575 30th Septemebr, 2029 तक नवीनीकृत कर भेजी जा रही है / Licence Number: G/HO/GJ/05/586 & G/HO/GJ/06/575 is renewed and valid upto 30th Septemebr, 2029 is forwarded herewith.

कृपया नोट करें कि गैस सिलेण्डर नियम, 2016 के नियम 55(5) के अनुसार, अनुज्ञप्ति के पुनः नवीकरण हेतु आवेदन The Dy. Chief Controller of Explosives, Vadodara इस कार्यालय को इस अनुज्ञप्ति की वैधता समाप्त होने के पूर्व (दिनांक 30 सितम्बर2029 को या इससे पूर्व) जमा कर दें। दिनांक 30 सितम्बर 2029 के पश्चात परंतु दिनांक 30 सितम्बर 2030 से पूर्व प्राप्त नवीनीकरण आवेदन, गैस सिलेण्डर नियम, 2016 के नियम 55(7) के अनुसार विलंब शुल्क के साथ ही विचाराधीन होगा। दिनांक 30 सितम्बर 2030 तक कोई नवीनीकरण आवेदन प्राप्त नही होने की स्थिति में यह अनुज्ञप्ति स्वतः निरस्त हो जाएगी। /Please note that application for renewal of the licence should be submitted so as to reach the The Dy. Chief Controller of Explosives, Vadodara before the licence expires (i.e. on or before 30th Septemebr, 2029) as required under Rule 55(5) of Gas Cylinders Rules, 2016. Application for renewal of licence received after 30th Septemebr, 2029 but not later than 30th September, 2030 shall be considered only with late fee applicable vide Rule 55(7) (a)(b) of said Rules. The licence will automatically expire if no application is received upto 30th Septemebr, 2030 .

कृपया इस पत्र की प्राप्ति की पावती दें/ Please acknowledge the receipt of the same.

भवदीय /Yours faithfully,

(()
(Mohanlal Jana))

Dy. Controller of Explosives
कृते उप मुख्य विस्फोटक नियंत्रक
For Dy. Chief Controller of Explosives
वडोदरा/Vadodara

[अधिक जानकारी जैसे आवेदन की स्थिति, शुल्कों तथा अन्य विवरण के लिए कृपया हमारी वेबसाइट http://peso.gov.in देखें।]
(For more information regarding status,fees and other details please visit our website http://peso.gov.in)

FORM E

(See Rules 50, 51 and 54)

Licence to fill compressed gas in cylinders

Licence No : G/HO/GJ/05/586(G22172)

Fee Rs 2500/- per year

Licence is hereby granted to **M/S GUJARAT FLUOROCHEMICALS LIMITED, 12/A~ GIDC DAHEJ INDUSTRIAL ESTATE~, TAL.VAGRA, City: BHARUCH, District: BHARUCH, State: Gujarat, Pin: 392130** valid only for the filling of cylinders with compressed gas in the licensed premises described below and shown in the plan No **G/HO/GJ/05/586(G22172)** dated **30/04/2007** subject to the provisions of the Explosives Act, 1884(4 of 1884) and the rules made thereunder and to the further conditions of this licence.

The Licence shall remain in force till the **30th September 2019.**

April 30, 2007

For Chief Controller of Explosives
Nagpur

1)Amendment dated - 29/01/2008
2)Amendment dated - 17/05/2016
3)Amendment dated - 03/08/2016

DESCRIPTION AND LOCATION OF THE LICENSED PREMISES

The licensed premises, the layout boundaries and other particulars of which are shown in the attached approved plan No **G/HO/GJ/05/586** dated **April 30, 2007** are situated at **Dahej** and consists of **HYDROGEN - 38 Nos.(1x4 2x16)** filling points with connected other fecilities for filling of the gas(es) in cylinders as described here under:

	Type of Gas	
a)	Toxic	--NIL--
b)	Non-Toxic and Non Flammable	--NIL--
c)	Non-Toxic and Flammable	HYDROGEN
d)	Dissolved Acetylene Gas	--NIL--
e)	Non-Toxic & Flammable liquefiable gas other than LPG	--NIL--
f)	Liquefied Pertoleum Gas	--NIL--

and is situated at PlotNo :**12A** Name of Street :**GIDC Dahej Industrial Estate Ta Vagra** Village/Town :**Dahej** Police Station : District : **BHARUCH**, State: **Gujarat.**

SPACE FOR ENDORSEMENT OF RENEWALS

	Date of Renewal	Date of Expiry	Signature and stamp of the licensing authority
This licence shall be renewable without any concession in fee for ten years in the absence of contravention of the provision of the Explosives Act, 1884, or Gas Cylinders Rules, 2004, framed thereunder or of the conditions of the licence	04/09/2009	30/09/2019 नवीनीकृत 30/09/2029 तक	Rajnish Piplani

This licence is liable to be cancelled if the licenced premises and [illegible] conforming to the description and conditions attached hereto and contravention of any of the rules and conditions under which this licence is granted and the holder of this licence is also punishable with imprisonment for the term which may extend to two years or with fine which may extend to three thousand rupees or with both

910

FORM F

(See Rules 50, 51 and 54)

Licence to store compressed gas in cylinders

Licence No : **G/HO/GJ/06/575(G22172)** Fee Rs 1000/- per year

Licence is hereby granted to **M/S GUJARAT FLUOROCHEMICALS LIMITED, 12/A~ GIDC DAHEJ INDUSTRIAL ESTATE~, TAL.VAGRA, City: BHARUCH, District: BHARUCH, State: Gujarat, Pin: 392130** valid only for the possession of cylinders filled with compressed gas in the licensed premises described below and shown in the plan No **G/HO/GJ/06/575(G22172)** dated **30/04/2007** subject to the provisions of the Explosives Act, 1884 (4 of 1884) and the Rules made thereunder and to the further conditions of this licence.
The Licence shall remain in force till the **30th September 2019.**

April 30, 2007

For Chief Controller of Explosives
Nagpur

1)Amendment dated - 29/01/2008
2)Amendment dated - 17/05/2016
3)Amendment dated - 03/08/2016

DESCRIPTION AND LOCATION OF THE LICENSED PREMISES

The licensed premises, the layout boundaries and other particulars of which are shown in the attached approved plan No **G/HO/GJ/06/575** dated **April 30, 2007** are situated at **Dahej** and consists of a storage shed for possession of the gas contained in cylinders as described here under

	Type of Gas	Quantity
a)	Toxic	--NIL--
b)	Non-Toxic and Non Flammable	--NIL--
c)	Non-Toxic and Flammable	HYDROGEN - 315 Nos.
d)	Dissolved Acetylene Gas	--NIL--
e)	Non-Toxic & Flammable liquefiable gas other than LPG	--NIL--
f)	Liquefied Pertoleum Gas	--NIL--

and is situated at PlotNo :**12A** Name of Street : **GIDC Dahej Industrial Estate Ta Vagra** Village/Town :**Dahej** Police Station : District **BHARUCH**, State **Gujarat.**

SPACE FOR ENDORSEMENT OF RENEWALS

	Date of Renewal	Date of Expiry	Signature and stamp of the licensing authority
This licence shall be renewable without any concession in fee for ten years in the absence of contravention of the provision of the Explosives Act, 1884, or Gas Cylinders Rules, 2004, framed thereunder or of the conditions of the licence	04/09/2009	30/09/2019 नवीनीकृत 30/09/2029	Rajnish Piplani उप मुख्य विस्फोटक नियंत्रक, वडोदरा

This licence is liable to be cancelled if the licenced premises are not found conforming to the description and conditions attached hereto and contravention of any of the rules and conditions under which this licence is granted and the holder of this licence is also punishable with imprisonment for the term which may extend to two years or with fine which may extend to three thousand rupees or with both.

Print Back

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वाणिज्य और उद्योग मंत्रालय /Ministry of Commerce & Industry
पेट्रोलियम तथा विस्फोटक सुरक्षा संगठन (पैसो) /Petroleum & Explosives Safety Organisation (PESO)

इमेल /E-mail : **explosives@explosives.gov.in**
दूरभाष /Phone/Fax No : **0712 -2510248, Fax-2510577**

सं/No : **G/HO/GJ/05/586 & G/HO/GJ/06/575(G22172)** दि/Dated : **24/09/2024**

सेवा में/
To,

M/s. M/S GUJARAT FLUOROCHEMICALS LIMITED,
12/A~ GIDC DAHEJ INDUSTRIAL ESTATE~,,
TAL.VAGRA
Ambheta,
Bharuch,
Taluka: Vagra,
District: BHARUCH
State: Gujarat
Pin : 392130

विषय/ Sub : **Plot No, 12A, GIDC Dahej Industrial Estate Ta Vagra, Dahej, Vagra, Taluka: Vagra, District: BHARUCH, State: Gujarat, Pin : 392130.** में सिलण्डररों में **HYDROGEN** गैस का भरण-एवं भण्डा5रण गोडाउन,गैस सिलेण्डLर्स नियम, 2016 के अंतर्गत जारी अनुज्ञप्ति सं. **G/HO/GJ/05/586 & G/HO/GJ/06/575(G22172)** – अनुज्ञप्ति संशोधित करने के बारे में//Filling of **HYDROGEN** and Storage of **HYDROGEN** gas in cylinders at **Plot No, 12A, GIDC Dahej Industrial Estate Ta Vagra, Dahej, Vagra, Taluka: Vagra, District: BHARUCH, State: Gujarat, Pin : 392130.** Licence No. **G/HO/GJ/05/586 & G/HO/GJ/06/575(G22172)** granted in Form E&F of Gas Cylinders Rules, 2016 - Amendment of Licence regarding.

महोदय/
Sir(s),

कृपया आपके दि. **06/09/2024** के पत्र सं. **OIN1150746** का संदर्भ ग्रहण करें/ Please refer to your application No.**OIN1150746** dated **06/09/2024** for **Change in Layout ,**.

फार्म इ एवं एफ के अंतर्गत जारी अनुज्ञप्ति सं. **G/HO/GJ/05/586 & G/HO/GJ/06/575** इसके साथ संशोधित कर भेजी जा रही हैं/ The licence number in Form-E&F **G/HO/GJ/05/586 & G/HO/GJ/06/575** is sent herewith duly amended -

(The amendment is due to Change in Layout , Change in Capacity Details , Change in Layout)

अनुज्ञप्ति फ़ीस में बदलाव हुआ है और भण्डारकरण के लिए फ़ीस रु. **4000/-** प्रति वर्ष तथा भरण के लिए फ़ीस रु **5000/-** प्रति वर्ष है. यह अनुज्ञप्ति दिनांक 30 सितम्बर **2029** तक प्रवृत्त रहेगी । The licence fee is changed. Storage fee is Rs. **4000/-** per year and Filling fee is Rs.**5000/-** per year and the licence is valid upto **30th Sep, 2029.**

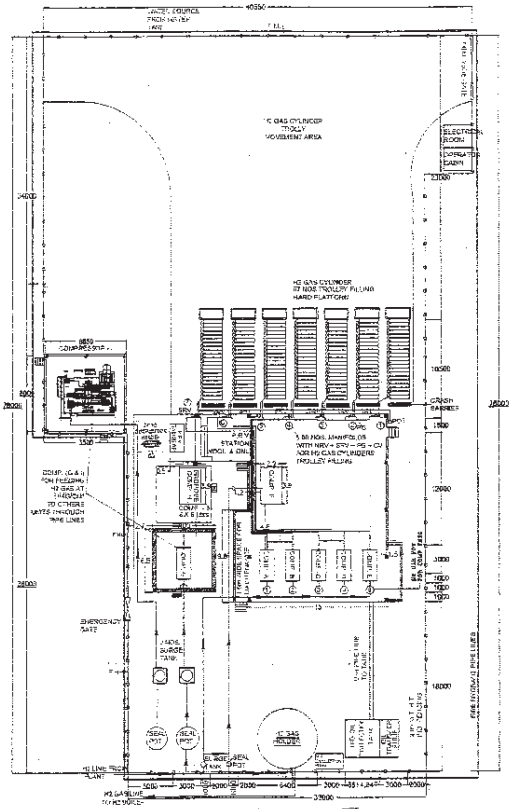
कृपया पावती दें और भावी पत्राचार में इस अनुज्ञप्ति नंबर का संदर्भ दें. नवीनीकरण के लिए गैस सिलिण्डर नियम 2016 के नियम 55 के अनुसार प्रक्रिया का अनुपालन करें । / Please acknowledge the receipt of the same and quote this licence number in future correspondence.Please follow a procedure under Rule 55 of Gas Cylinders Rules, 2016 for Renewal of License.

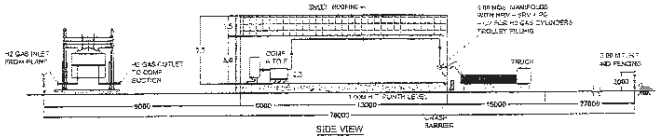
भवदीय/Yours faithfully,

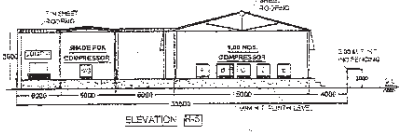
(()
(Dr D Jeevarathinam))

Dy. Controller of Explosives
कृते मुख्य विस्फोटक नियंत्रक
For Chief Controller of Explosives
/Nagpur

Copy forwarded to :-
1. The Jt. Chief Controller of Explosives, Vadodara. A Copy of the licence along with approved plan is enclosed.









REMARKS

1. REFER DWG. NO. GFL/HO-H2P-S-M001 REV. '1' FOR PIPING DETAILS.
2. REFER DWG. NO. '' FOR TOTAL PLOT PLAN DETAILS.
3. REFER DWG. NO. '' FOR LOCATION PLAN DETAILS.

R-5 | DATE : 16-03-2020 / 30-04-2021

1. EXISTING 4 TO 5 H2 COMPRESSORS OF 20NM3/HR FOUNDING AND SEATING DETAILS FOR 8NOS H2 CYLINDERS TROLLEY FILLING ARRANGEMENT.
2. EXISTING 2NOS H2 COMPRESSORS OF 10NM3/HR ARE PROJECT FOR FILLING 7 NOS H2 CYLINDERS ON TROLLEY THROUGH PIPE LINES.
3. EARLIER APPROVING COMPRESSORS HAVE NOT INSTALL (NOT PROVIDED AS H2 HANDLING EQUIPMENT NOT INSTALLED
4. NO LOOSE H2 CYLINDERS FILLING + STORAGE DONE ORIGINAL LIC NO.DIPETI/LS/2017/10 IS STILL CONTROLLED.
5. EXISTING LIC NO. 000001 / P / 000017 FOR H2 GAS CYLINDERS FILLING BY FLOOR LOOSE CONP. H2 BY FOR FILLING NO WAS AT PRESENT TO OTHERS UNITS THROUGH PIPE LINES.

NOTE

1. KEEP CYLINDER FILLING PLANT AREA DRY & CLEAN.
2. CONSTRUCT H2 FILLING PLANT FACILITY WITH FLAME PROOF MATERIAL ONLY.
3. PROVIDE ELECTRICAL FITTING LIKE SWITCH MOTOR, AS PER FLAME PROOF FOR H2 GAS GROUP IIC.
4. PROVIDE EFFECTIVE ELECTRICAL EARTHING TO ALL EQUIPMENTS, PIPELINES AND TROLLEY CYLINDERS PROPER WISE CHECK.
5. PROVIDE ALL TYPE OF TOOLS AND HANDLING SYSTEM OF SPARK LESS TYPES.
6. PROVIDE COPPER FLEXIBLE PIPES TO ELIM HIGH PRESSURE HYDROGEN GAS FILLING ACTIVITY SAFELY THROUGHOUT.
7. DO NOT DO ANY HOT WORKS IN AND THE BATTERY LIMIT AREA OF BOTTLING PLANT.
8. PARKING OF SUPPLY VEHICLES/ROAD MUST BE DONE WITH PROPER TYPES LOCKING DEVICES AND SWITCHE OFF OF BATTERY.
9. PROVIDE EFFECTIVE CRASH BARRIERS TO AVOID DAMAGE OF FILLING PLANT AREA FILLING PROPER SAFETY UP.
10. PROVIDE SYSTEM H2 SENSORS WITH ALARM SYSTEM.
11. PROVIDE FIRE FIGHTING FACILITY LIKE
- 4NOS 10KGS DCP DRY CHEMICAL POWDER
- 10NOS 10LITS SPF FOAM FILLED BUCKETS
- 2NOS 75L F TROLLEY MOUNT TYPE
- 1NOS 9KG CO2 FIRE EXTINGUISHERS
- 2NOS 2KG H2O SPRAYING SCANS
- 3NOS X IKGS DCP FIRE EXTINGUISHERS

DETAILS OF COMPRESSORS UNITS

COMP	WORKING PRESSURE	MAKE/SR NO.	STATUS	REMARK
A	20NM3/HR	TROLLEY FILLING	EXISTING	
B	20NM3/HR	TROLLEY FILLING	EXISTING	
C	20NM3/HR	TROLLEY FILLING	EXISTING	
D	20NM3/HR	TROLLEY FILLING	EXISTING	
E	20NM3/HR	TROLLEY FILLING	EXISTING	
F	20NM3/HR	TROLLEY FILLING	EXISTING	
G	10NM3/HR	PIPELINE TO B.T.L	INSTALLED	
H	20NM3/HR	TROLLEY FILLING	EXISTING	
I	20NM3/HR	PIPELINE TO B.T.L	INSTALLED	

AS BUILT

For Gujarat Fluorochemicals Ltd.

Authorised Signatory

Rev.	Description	Date	Drawn	Chkd	Appd
B	AS BUILT	15.04.2022	AMAR	PMC	KBA
A	ADDED GAP M12 CUSTOMER TRUNK HEADER	07.12.2021	VASU	PMC	KBA
A	AS BUILT	27.05.2021	VASU	PMC	KBA

REVISION STATUS

GUJARAT FLUOROCHEMICALS LIMITED
DAHEJ COMPLEX, BHARUCH

PLANT : GFL | AREA CODE : H2 BOTTLING | EQPT. NO

TITLE : LAYOUT OF H2 BOTTLING PLANT FOR GFL

BY	NAME	SIGN.	DATE
APPD	K.ANILKAR		20.05.15
CHKD	R.K.GAYAL		20.05.15
DRAWN	SAILENDRA		20.05.15
SHEET	OF		

PROJ. | SCALE: NTS | DRG.NO: GFL-CA-ISO-D0075 | REV. 08

Digitally signed by DR JEEVRATHINAM D
Reason: Licence No.: GHO/GJ/05/566 & G/HO
Location: Nagpur [G22172]

भारत सरकार/Government of India
वाणिज्य और उद्योग मंत्रालय/Ministry of Commerce & Industry
पेट्रोलियम तथा विस्फोटक सुरक्षा संगठन (पैसो) /Petroleum & Explosives Safety Organisation (PESO)
9वीं मंजिल, पार्क पैराडाइज, वडसर,
वडोदरा- 390012
9th Floor, Park Paradise,
Vadsar,
Vadodara - 390012

ई-मेल:/E-mail :
jtcce.vadodara@explosives.gov.in
फोन / फ़ैक्स नंबर:/Phone/Fax No : **0265 - 2361035**

अनुज्ञप्ति सं./No : S/HO/GJ/03/1165(S35006) दिनांक/Dated : **22/07/2024**

सेवा में/To,

M/s. Gujrat Fluorochemicals Limited,
12/A ,GIDC Industrial Estate,
Dahej,
Bharuch,
Bharuch,
Taluka: Vagra,
District: BHARUCH,
State: Gujarat
PIN: 392130

विषय :/Sub : Plot No, Plot No. 12A ,GIDC, Bharuch-Dahej Road to Ambetta Vill. Road, Dahej (Taluka Vagra), Vagra, Taluka: Vagra, District: BHARUCH, State: Gujarat, PIN: 391230 स्थित LIQUID NITROGEN, गैस के संपीडित पात्र / पात्रों में भंडारण के लिए स्थिर एवं गतिशील दाब पात्र (अज्वलित) नियम, 2016 के अधीन स्वीकृत अनुज्ञप्ति संख्या S/HO/GJ/03/1165 के नवीनीकरण संबंध में /Storage of NLIQUID NITROGEN gas in pressure vessels at Plot No, Plot No. 12A ,GIDC, Bharuch-Dahej Road to Ambetta Vill. Road, Dahej (Taluka Vagra), Vagra, Taluka: Vagra, District: BHARUCH, State: Gujarat, PIN: 391230 - Licence No : S/HO/GJ/03/1165 grant in form LS-1A of SMPV(U) Rules, 2016-Renewal of Licence Regarding

महोदय/Sir(s),

कृपया आपके दिनांक : 04/07/2024 के पत्र संख्या: **OIN1665448** का संदर्भ ग्रहण करें ।/Please refer to your application No.**OIN1665448** dated 04/07/2024 .

अनुज्ञप्ति संख्या : **S/HO/GJ/03/1165** का नवीकरण दिनांक 30th सितंबर 2029 तक कर इसके साथ अग्रेषित की जा रही हैं ।
Licence Number: **S/HO/GJ/03/1165** is renewed and is valid upto **30th September 2029** is forwarded herwith.

दिनांक 30/09/**2029** . से आगे अनुज्ञप्ति नवीनीकरण हेतु उपरोक्त नियम के नियम 55 के प्रावधानों का पालन किया जाएं । विलंब शुल्क से बचने हेतु शुल्क के साथ मूल अनुज्ञप्ति तथा अन्य दस्तावेज अधिकतम दिनांक : 30 सितंबर, **2029** तक **The Jt. Chief Controller of Explosives, Vadodara Circle, Vadodara** में जरूर पहुंच जाने चाहिए ।
The provisions of the Rule 55 of the above said rules shall be followed for further renewal of the licence beyond 30/9/**2029**. The renewal application along with fees, Original licence and other documents shall reach in the Office of **The Jt. Chief Controller of Explosives, Vadodara Circle, Vadodara**, latest by 30th September,**2029** to avoid late fee.

कृपया अनुज्ञप्ति प्राप्ति की पावती दें ।/Please acknowledge the receipt of the licence.

भवदीय/Yours faithfully,

((के.पी.शर्मा)
(K. P. SHARMA))
उप मुख्य विस्फोटक नियंत्रक
Dy. Chief Controller of Explosives
कृते संयुक्त मुख्य विस्फोटक नियंत्रक
For Jt. Chief Controller of Explosives
वडोदरा/Vadodara

914

(अधिक जानकारी जैसे आवेदन की स्थिति, शुल्क तथा अन्य विवरण के लिए हमारी वेबसाइट : http://peso.gov.in देखें)
(For more information regarding status,fees and other details please visit our website http://peso.gov.in)

Note:-This is system generated document does not require signature.

Digitally signed by K P SHARMA
Reason: Licence No. : S/HO/GJ/03/1165
Location:Vadodara [S35006]
Date:22-07-2024 19:37:21 PM

915

भारत सरकार/Government of India
वाणिज्य और उद्योग मंत्रालय/Ministry of Commerce & Industry
पेट्रोलियम तथा विस्फोटक सुरक्षा संगठन (पैसो) /Petroleum & Explosives Safety Organisation (PESO)
9वीं मंजिल, पार्क पैराडाइज, वडसर
वडोदरा- 390012
9th Floor, Park Paradise, Vadsar,
Vadodara - 390012

ई-मेल:/E-mail :
jtcce.vadodara@explosives.gov.in
फोन / फ़ैक्स नंबर:/Phone/Fax No : **0265 - 2361035**

अनुज्ञप्ति सं./No : S/HO/GJ/03/2408(S103799) दिनांक/Dated : **04/09/2023**

सेवा में/To,

M/s. Gujarat Fluorochemicals Limited,
12/A, GIDC Industrial area , Dahej,
12/A, GIDC Industrial area , Dahej,
Bharuch,
Taluka: Vagra,
District: BHARUCH,
State: Gujarat
PIN: 392130

विषय :/Sub : Plot No, 12/A, 12/A , Dahej industrial Estate Taluka -Vagra Dist-Bharuch PIn-392130, Dahej, Bharuch, Taluka: Vagra, District: BHARUCH, State: Gujarat, PIN: 392130 स्थित ANHYDROUS HYDROFLUORIC ACID (AHF), गैस के संपीडित पात्र / पात्रों में भंडारण के लिए स्थिर एवं गतिशील दाब पात्र (अज्वलित) नियम, 2016 के अधीन स्वीकृत अनुज्ञप्ति संख्या S/HO/GJ/03/2408 के नवीनीकरण संबंध में /Storage of NANHYDROUS HYDROFLUORIC ACID (AHF) gas in pressure vessels at Plot No, 12/A, 12/A , Dahej industrial Estate Taluka -Vagra Dist-Bharuch PIn-392130, Dahej, Bharuch, Taluka: Vagra, District: BHARUCH, State: Gujarat, PIN: 392130 - Licence No : S/HO/GJ/03/2408 grant in form LS-1A of SMPV(U) Rules, 2016-Renewal of Licence Regarding

महोदय/Sir(s),

कृपया आपके दिनांक : 03/09/2023 के पत्र संख्या: **OIN1386639** का संदर्भ ग्रहण करें I/Please refer to your application No.**OIN1386639** dated 03/09/2023 .

अनुज्ञप्ति संख्या : **S/HO/GJ/03/2408** का नवीकरण दिनांक 30th सितंबर 2028 तक कर इसके साथ अग्रेषित की जा रही हैं I

Licence Number: **S/HO/GJ/03/2408** is renewed and is valid upto **30th September 2028** is forwarded herwith.

दिनांक 30/09/**2028** . से आगे अनुज्ञप्ति नवीनीकरण हेतु उपरोक्त नियम के नियम 55 के प्रावधानों का पालन किया जाएं I विलंब शुल्क से बचने हेतु शुल्क के साथ मूल अनुज्ञप्ति तथा अन्य दस्तावेज अधिकतम दिनांक : 30 सितंबर, **2028** तक **The Jt. Chief Controller of Explosives, Vadodara Circle, Vadodara** में जरूर पहुंच जाने चाहिए I

The provisions of the Rule 55 of the above said rules shall be followed for further renewal of the licence beyond 30/9/**2028.** The renewal application along with fees, Original licence and other documents shall reach in the Office of **The Jt. Chief Controller of Explosives, Vadodara Circle, Vadodara**, latest by 30th September,**2028** to avoid late fee.

कृपया अनुज्ञप्ति प्राप्ति की पावती दें I/Please acknowledge the receipt of the licence.

भवदीय/Yours faithfully,

((आर.वेणुगोपाल)
(Dr. R.Venugopal))
संयुक्त मुख्य विस्फोटक नियंत्रक
Jt. Chief Controller of Explosives
वडोदरा/Vadodara

(अधिक जानकारी जैसे आवेदन की स्थिति, शुल्क तथा अन्य विवरण के लिए हमारी वेबसाइट : http://peso.gov.in देखें)

916

(For more information regarding status,fees and other details please visit our website http://peso.gov.in)

Note:-This is system generated document does not require signature.

Disclaimer : This page gives the latest action taken by this organization on your application. This page is made available for the information of concerned applicant/licensee only. All efforts have been made to secure this information. However, PESO will not be responsible for any misuse of the information by unauthorized persons including the hackers.

फार्म फ /FORM F
नियम 50,51 और 54 देखें /(See Rules 50, 51 and 54)
Licence to store compressed gas in cylinders

अनुज्ञप्ति संख्या/ Licence No. : **G/WB/GJ/06/205(G47478)** वार्षिक शुल्क। रू/Fee Rs. **2000**/- per year

M/s. M/s. GUJARAT FLUOROCHEMICALS LIMITED, 12/A, GIDC DAHEJ INDUSTRIAL ESTATE, TAL- VAGRA, Village/Town: VAGRA, City: Vagra, Taluka: Vagra, District: BHARUCH, State: Gujarat, Pin: 392130 को नीचे वर्णित और रेखांक संख्या **G/WB/GJ/06/205(G47478)** dated **26/04/2018** में दर्शित किए गए अनुज्ञप्त परिसर में, भारतीय विस्फोटक अधिनियम, 1884 (1884 का 4) और उसके अधीन बनाए गए नियमों के उपबंधों तथा इस अनुज्ञप्ति की अन्य शर्तों के अधीन रहते हुए, केवल संपीड़ित गैस से भरे सिलेण्डरों को रखने के लिए ही विधिमान्य अनुज्ञप्ति दी जाती है। /
Licence is hereby granted to **M/s. M/s. GUJARAT FLUOROCHEMICALS LIMITED, 12/A, GIDC DAHEJ INDUSTRIAL ESTATE, TAL- VAGRA, Village/Town: VAGRA, City: Vagra, Taluka: Vagra, District: BHARUCH, State: Gujarat, Pin: 392130** valid only for the possession of cylinders filled with compressed gas in the licensed premises described below and shown in the plan No **G/WB/GJ/06/205(G47478)** dated **26/04/2018** subject to the provisions of the Explosives Act, 1884(4 of 1884) and the Rules made thereunder and to the further conditions of this licence.
यह अनुज्ञप्ति 30 सितम्बर 2027 तक प्रवृत्त रहेगी । / The Licence shall remain in force till the **30th September 2027.**

For Jt. Chief Controller of Explosives
Vadodara
कृते संयुक्त मुख्य विस्फोटक नियंत्रक
वडोदरा

April 26, 2018

1)Amendment dated - 26/11/2024

अनुज्ञप्त परिसर का विवरण और अवस्थिति / DESCRIPTION AND LOCATION OF THE LICENSED PREMISES

निम्नलिखित विवरण के अनुसार सिलेण्डरों में भरी गैस रखने के लिए अनुज्ञप्त परिसर, जिसकी अभिन्यास सीमाओं और अन्य विशिष्टियों को संलग्न अनुमोदित रेखांक सं **G/WB/GJ/06/205** dated **April 26, 2018** में दिखाया गया है, में अवस्थित है और जिसमें एक भण्डारण शेड है। / The licensed premises, the layout boundaries and other particulars of which are shown in the attached approved plan No. **G/WB/GJ/06/205** dated **April 26, 2018** are situated at **AMBHETHA** and consists of a storage shed for possession of the gas contained in cylinders as described here under:

	गैस का प्रकार /Type of Gas	मात्रा /Quantity
a)	विषैले/ Toxic	**AMMONIA - 50 Nos.**
b)	गैर विषैले और गैर ज्वलनशील /Non-Toxic and Non Flammable	**--NIL--**
c)	गैर विषैले और ज्वलनशील /Non-Toxic and Flammable	**--NIL--**
d)	घुलित एसिटिलीन गैस /Dissolved Acetylene Gas	**--NIL--**
e)	एलपीजी के अलावा गैर विषैले और ज्वलनशील द्रवित गैस /Non-Toxic & Flammable liquefiable gas other than LPG	**--NIL--**
f)	एलपीजी/ Liquefied Pertoleum Gas	**--NIL--**

और प्लाट संख्या PlotNo : **12/A,** गली का नाम गांव : **AMBHETHA** या नगर पुलिस थाना : **DAHEJ** जिला : **BHARUCH**,राज्या : **Gujarat**.
/ and is situated at PlotNo : **12/A,** Village/Town :**AMBHETHA** Police Station : **DAHEJ** District : **BHARUCH**, State: **Gujarat**.

नवीकरण के पृष्ठांकन के लिए स्थान / SPACE FOR ENDORSEMENT OF RENEWALS

	नवीकरण की तारीख/Date of Renewal	समाप्ति की तारीख/Date of Expiry	अनुज्ञप्ति प्राधिकारी के हस्ताक्षर/Signature and stamp of the licensing authority
इस अनुज्ञप्ति को, विस्फोटक अधिनियम, 1884 या उसके अधीन बनाए गए गैस सिलेण्डर नियम, 2016 के उपबंधों या इस अनुज्ञप्ति की शर्तों का उल्लंघन न होने की दशा में, फीस में कोई छूट दिए बिना दस वर्ष तक नवीकृत किया जाएगा ।/This licence shall be renewable without any concession in fee for ten years in the absence of contravention of the provision of the Explosives Act,1884 or Gas Cylinders Rules, 2016, framed thereunder or of the conditions of the licence			

यदि अनुज्ञप्त परिसर इससे उपाबद्ध विवरण और शर्तों के अनुरुप नहीं पाया जाता है और जिन नियमों और शर्तों के अधीन यह अनुज्ञप्ति दी गई है, उनमे से किसी का उल्लंघन होता है तो यह अनुज्ञप्ति रद्द की जा सकती है और अनुज्ञप्ति का धारक कारावास से, जिसकी अवधि दो वर्ष तक की हो सकेगी, या जुर्माने से, जो तीन हजार रुपये तक का हो सकेगा, या दोनों से, दण्डनीय भी होगा । / This licence is liable to be cancelled if the licenced premises are not found conforming to the description and conditions attached hereto and contravention of any of the rules and conditions under which this licence is granted and the holder of this licence is also punishable with imprisonment for the term which may extend to two years or with fine which may extend to three thousand rupees or with both.

<u>गैस सिलेंडर नियम, 2016 के अधीन विषाक्त गैस कंटेनरों / सिलेंडर के भरण एवं भंडारण के लिए अतिरिक्त शर्तों/ADDITIONAL CONDITIONS FOR FILLING AND OR STORAGE OF TOXIC GASES CONTAINERS/CYLINDERS UNDER GAS CYLINDEDRS RULES, 2016.</u>

1. परिसर में परिचालन स्विच के साथ एक प्रभावशाली अलार्म प्रणाली की व्यवस्था की जाएगी। आपात स्थिति में, परिसर में स्विच ऑपरेट करने पर नियंत्रण कक्ष में अलार्म सुना जा सकेगा।/An efficient alarm system with operating switch in the premises shall be provided. In case of emergency, the alarm can be heard in the control room by operating the switch in the premises.
2. विषाक्त गैस के रिसाव की आपात स्थिति के लिए एक आपदा प्रबंधन योजना तैयार की जाएगी। योजना द्वारा संबंधित अधिकारी की जिम्मेपदारी तय की जाएगी, जिन्हें रिसाव की स्थिति में विषाक्त गैस उपकरणों को संचालित करने के विभिन्न पहलुओं के बारे में प्रशिक्षित किया जाएगा।/A Disaster Management Plan for operation in case of emergency of leakage of toxic gas shall be prepared. The plan shall fix responsibility on the concerned officers who shall be trained in the different aspects of handling toxic gas equipments in case of leakage.
3. आपात स्थिति में उपयोग के लिए परिसर में या इसके पास एक या अधिक पर्याप्त दबाव के हायड्रंट पॉइंट्स उपलब्ध कराए जाएंगे।/One or more hydrant point(s) with adequate pressure shall be provided in or near the premises for use in emergency.
4. परिसर में कम से कम दो आत्म निहित श्वास तंत्र (सेल्फ कंटेंड ब्रीदिंग अॅपरेटस) और दो कनस्तर प्रकार के गैस मास्क सहज सुलभ स्थान में रखे जाएंगे ।/At

4. least two numbers self contained breathing apparatus and two Canister type Gas Masks shall be kept in the premises in a readily accessible location.
5. परिसर में या इसके पास विषाक्त गैस के रिसाव का पता लगाने के लिए पोर्टेबल उपकरण उपलब्ध कराया जाएगा।/Portable devices for detection of toxic gas leakage shall be made available in or near the premises.
6. हवा की दिशा निर्धारित करने के लिए उपयुक्त स्थान पर एक वातदिग्दर्शक-मुर्ग उपलब्ध कराया जाएगा जिससे विषाक्त गैस के रिसाव की स्थिति में श्रमिकों को हवा के विरूद्ध दिशा में स्थानांतरित किया जा सकें|/A weathercock shall be provided at a suitable location for determining wind direction so that in case of leakage of toxic gas, the workers can move against wind direction.
7. अनुज्ञप्तिधारी के पास विभिन्नए उपकरण और औजार, जैसे सिलेंडर और टनरों के लिए वाल्वn हूड, सिलेंडर वाल्व रिसाव के लिए क्लैं प और टनरों के वॉल्वे के रिसाव के लिए चेन और योक असेंबलि सहित उपकरणों से मिलकर बनी आपातकालीन किट उपलब्ध होनी चाहिए ।/Emergency kit consisting of various appliances and tools including valve hood assembly for cylinders and tonners, clamp for cylinder valve leaks and chain and yoke assembly for tonner valve leaks shall be available with the licensee.
8. संयंत्र के बंद होने/ लॉक-अप के मामले में, परिसर में कोई विषाक्त गैस युक्त सिलेंडर नही रखा जाएगा।/In case of closure/cock-up of the filling plant, no cylinder containing toxic gas shall be retained in the premises.
9. रिसाव के मामले में विषाक्त गैस के निष्प्रभावीकरण के लिए पर्याप्त सुविधाएं प्रदान की जाएगी।/Adequate facilities for neutralization of toxic gas shall be provided in case of leakage.
10. विषाक्त गैस परिसर में उचित सिलेंडर लदान (लोडिंग)/माल उतराई (अनलोडिंग) और हथलाई (हैंडलिंग) की व्यवस्था की जाएगी।/Proper cylinder loading/unloading and handling arrangements shall be made in the toxic gas premises.

for Jt. Chief Controller of Explosives
Vadodara
कृते संयुक्त मुख्य विस्फोटक नियंत्रक
वडोदरा

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Digitally signed by K P SHARMA
Reason: Licence No. : G/WB/GJ/06/205
Location:Vadodara [G47478]
Date:26-11-2024 16:39:40 PM

Government of India
Ministry of Commerce & Industry
Petroleum & Explosives Safety Organisation (PESO)
9th Floor, Park Paradise,
Vadsar,
Vadodara - 390012

E-mail : **jtcce.vadodara@explosives.gov.in**
Phone/Fax No : **0265 - 2361035**

No : A/G/WB/GJ/GCT/101(G128288) Dated : **29/05/2024**

To,

M/s. GUJARAT FLUOROCHEMICALS LIMITED,
12/A, GIDC, DAHEJ, INDUSTRIAL ESTATE, TALUKA VAGRA, DISTT. BHARUCH-392130 12/A, GIDC, DAHEJ, INDUSTRIAL ESTATE, TALUKA VAGR,
DAHEJ,
Vagra,
Taluka: Vagra,
District: BHARUCH
State: Gujarat
Pin : 392130

Sub : Periodical Examination and testing of **CHLORINE , Seamless,Welded,Seamless,Seamless** cylinders at **Plot No, 12-A, Dahej Industrial area, AMBHTA, Vagra, Taluka: Vagra, District: BHARUCH, State: Gujarat, Pin : 392130.**Amendment under Gas Cylinders Rules, 2016 regarding.

Sir(s),

Please refer to the inspection of your works by an office of the office of the on .

There is no objection to your carrying out periodic examination and testing of **CHLORINE , Seamless,Welded,Seamless,Seamless** cyliners in your above mentioned container testing station subject to the obsevance of the following conditions:

1.The degassing of the contents shall be done at the place approved by this office.The cylinders shall be fully degassed till they show zero reading for the absence of the flammable gas when tested with Explosives meter before subjecting the cylinders for testing.

2.Not more than five cylinders shall be degassed at a time.

3.The degassing and testing of cylinders shall be carried out only during daylight hours.

4.The examination and testing of cylinders shall be carried out only under continuous supervision of qualified and experinaced pesonnel.

5.The Cylinders,which are approved for filling in writing by CCE office ,shall only be undertaken for periodic examination/Testing.

6.All provisions of the relevant Indian standard code of practice for cylinders inclusive visual inspection shall ebe observed.

7.CNG-ONB cylinders shall be subjected to Ultrasonic flaw detection test as per Annex D to IS:15490:2004.

8.The cylinders passed in the periodical examination and testing shall be marked with the code mark of the testing station and other relevant information as required under rule 6 of the Gas cylinders Rules,2016.The due date for next test or the the date of expiry of service life of the cylinder, as the case may be,shall be clerly marked on the stainless steel ring inserted between the valve and the neck of the cylinders.

9.The quality management system of the testing station shall be covered under ISO:9001 certification from BIS or any other internationally reputed certifying agency with the accrediation with NABCB(Indian Acrediation Body)with in six months.

10.The requirements of Provisions of Rule 35 of the said rules shall be followed and records of test and examination of Cylinders shall be maintained for the service life of the Cylinders.The data record maintainanace system shall be fully computerised .

11.The cylinders found unserviceable (Service life expired and failed in tests) shall be condemned as required under rule 36 of the said rules,and records there of shall be furnished to this office on the 1st of January,April,July and October every year.

12.No change in the organisational set up and machinery of testing station shall be effected without obtaining approval of this office.

13.The other relevant provisions of the said rules are complied with.

The approval may be reviewed,ammended or withdrawn at any time.if considered necessary in the intrest of safety

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or if any of the conditions mentioned above is violated or not complied with.

This permission is valid for the period upto **30/09/2034** date which may be extended further on submission of performance report, Renewal fee and ISO Certificate on or before the expiry of this approval.

The approval Accorded under rule 35 of the gas Cylinders Rule,2016 does not absolve you from obtaining necessary permission/clearance under other statutes/local Regulations,if any applicable for setting up and operation of a cylinder testing Station,which please be noted.

A Copy of Lay out drawing is returned here with duly endorsed in token of approval

Amendment Details

1). Amendment dated - 29/05/2024

Yours faithfully,

(Dr. R.Venugopal)
Jt. Chief Controller of Explosives
Vadodara

Copy together with a copy of approved drawing is forwarded to .With referance to his Memo Number:_____

Note:-This is system generated document does not require physical signature.

Digitally signed by DR R VENUGOPAL
Reason: Licence No. : A/G/WB/GJ/GCT/101
Location:Vadodara [G128288]
Date:29-05-2024 14:03:45 PM

भारत सरकार/Government of India
वाणिज्य और उद्योग मंत्रालय/Ministry of Commerce & Industry
पेट्रोलियम तथा विस्फोटक सुरक्षा संगठन (पैसो) /Petroleum & Explosives Safety Organisation (PESO)
9वीं मंजिल, पार्क पैराडाइज, वडसर,
वडोदरा- 390012
9th Floor, Park Paradise,
Vadsar,
Vadodara - 390012

ई-मेल:/E-mail :
jtcce.vadodara@explosives.gov.in
फोन / फ़ैक्स नंबर:/Phone/Fax No : **0265 - 2361035**

अनुज्ञप्ति सं./No : S/HO/GJ/03/915(S30612) दिनांक/Dated : **27/09/2024**

सेवा में/To,

M/S. GUJARAT FLUOROCHEMICALS LTD,,
GUJARAT FLUOROCHEMICALS LIMITED,
12/A, DAHEJ GIDC INDUSTRIAL AREA,
AMBHETA,
Vagra,
Taluka: Vagra,
District: BHARUCH,
State: Gujarat
PIN: 391230

विषय :/Sub : Plot No, Plot No. 12A, GIDC EState Area, Tal. Vagra, DAHEJ, Vagra, Taluka: Bharuch, District: BHARUCH, State: Gujarat, PIN: 391230 स्थित CHLORINE, गैस के संपीडित पात्र / पात्रों में भंडारण के लिए स्थिर एवं गतिशील दाब पात्र (अज्वलित) नियम, 2016 के अधीन स्वीकृत अनुज्ञप्ति संख्या S/HO/GJ/03/915 के नवीनीकरण संबंध में /Storage of NCHLORINE gas in pressure vessels at Plot No, Plot No. 12A, GIDC EState Area, Tal. Vagra, DAHEJ, Vagra, Taluka: Bharuch, District: BHARUCH, State: Gujarat, PIN: 391230 - Licence No : S/HO/GJ/03/915 grant in form LS-1A of SMPV(U) Rules, 2016- Renewal of Licence Regarding

महोदय/Sir(s),

कृपया आपके दिनांक : 27/09/2024 के पत्र संख्या: **OIN1779271** का संदर्भ ग्रहण करें ।/Please refer to your application No.**OIN1779271** dated 27/09/2024 .

अनुज्ञप्ति संख्या : **S/HO/GJ/03/915** का नवीकरण दिनांक 30th सितंबर 2029 तक कर इसके साथ अग्रेषित की जा रही हैं ।

Licence Number: **S/HO/GJ/03/915** is renewed and is valid upto **30th September 2029** is forwarded herwith.

दिनांक 30/09/**2029** . से आगे अनुज्ञप्ति नवीनीकरण हेतु उपरोक्त नियम के नियम 55 के प्रावधानों का पालन किया जाएं । विलंब शुल्क से बचने हेतु शुल्क के साथ मूल अनुज्ञप्ति तथा अन्य दस्तावेज अधिकतम दिनांक : 30 सितंबर, **2029** तक **The Jt. Chief Controller of Explosives, Vadodara Circle, Vadodara** में जरूर पहुंच जाने चाहिए ।

The provisions of the Rule 55 of the above said rules shall be followed for further renewal of the licence beyond 30/9/**2029**. The renewal application along with fees, Original licence and other documents shall reach in the Office of **The Jt. Chief Controller of Explosives, Vadodara Circle, Vadodara**, latest by 30th September,**2029** to avoid late fee.

कृपया अनुज्ञप्ति प्राप्ति की पावती दें ।/Please acknowledge the receipt of the licence.

भवदीय/Yours faithfully,

((के.पी.शर्मा)
(K. P. SHARMA))
उप मुख्य विस्फोटक नियंत्रक
Dy. Chief Controller of Explosives
कृते संयुक्त मुख्य विस्फोटक नियंत्रक
For Jt. Chief Controller of Explosives
वडोदरा/Vadodara

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(अधिक जानकारी जैसे आवेदन की स्थिति, शुल्क तथा अन्य विवरण के लिए हमारी वेबसाइट : http://peso.gov.in देखें)

(For more information regarding status,fees and other details please visit our website http://peso.gov.in)

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Disclaimer : This page gives the latest action taken by this organization on your application. This page is made available for the information of concerned applicant/licensee only. All efforts have been made to secure this information. However, PESO will not be responsible for any misuse of the information by unauthorized persons including the hackers.

भारत सरकार /Government of India
वाणिज्य और उद्योग मंत्रालय/Ministry of Commerce & Industry
पेट्रोलियम तथा विस्फोटक सुरक्षा संगठन /Petroleum & Explosives Safety Organisation (PESO)
आठवी मंजिल, यश कमल बिल्डींग,सयाजी गंज
वडोदरा - 390020
8th Floor, Yash Kamal Building, Sayajigunj, Vadodara - 390020

इमेल /E-mail : dyccebaroda@explosives.gov.in
दूरभाष /Phone/Fax No : 0265 - 2225159

दि/Dated : 10/10/2022

सं/No : G/HO/GJ/05/591 & G/HO/GJ/06/580(G22655)

सेवा में /To,

M/S GUJARAT FLUOROCHEMICALS LIMITED,
12/A GIDC DAHEJ INDUSTRIAL ESTATE,,
TAL.VAGRA
Ambetha,
Bharuch,
Taluka: Vagra,
District: BHARUCH
State: Gujarat
Pin : 392130

विषय/Sub : Plot No, 12/A, GIDC Estate Taluka Vagra, Dahej, Vagra, Taluka: Vagra, District: BHARUCH, State: Gujarat, Pin : 392130में सिलण्डररों में CHLORINE गैस का भरण-एवं भण्डारण गोडाउन- गैस सिलेण्डर्स नियम, 2016 के अंतर्गत फार्म 'इ' एवं 'एफ' में जारी अनुज्ञप्ति सं. G/HO/GJ/05/591 & G/HO/GJ/06/580(G22655) नवीकरण के बारे में / Filling of CHLORINE and Storage of CHLORINE at Plot No, 12/A, GIDC Estate Taluka Vagra, Dahej, Vagra, Taluka: Vagra, District: BHARUCH, State: Gujarat, Pin : 392130 Licence No. G/HO/GJ/05/591 & G/HO/GJ/06/580(G22655) granted in Form E & F of Gas Cylinders Rules, 2016 - Renewal regarding

महोदय/Sir(s),

कृपया आपके दि. 30/09/2022 के पत्र सं. OIN1172633 का संदर्भ ग्रहण करें/ Please refer to your application No.OIN1172633 dated 30/09/2022 .

अनुज्ञप्ति संख्या G/HO/GJ/05/591 & G/HO/GJ/06/580 30th Septemebr, 2027 तक नवीनीकृत कर भेजी जा रही है / Licence Number: G/HO/GJ/05/591 & G/HO/GJ/06/580 is renewed and valid upto 30th Septemebr, 2027 is forwarded herewith.

कृपया नोट करें कि गैस सिलेण्डर नियम, 2016 के नियम 55(5) के अनुसार, अनुज्ञप्ति के पुनः नवीकरण हेतु आवेदन The Jt. Chief Controller of Explosives, Vadodara Circle, Vadodara इस कार्यालय को इस अनुज्ञप्ति की वैधता समाप्त होने के पूर्व (दिनांक 30 सितम्बर2027 को या इससे पूर्व) जमा कर दें । दिनांक 30 सितम्बर 2027 के पश्चात परंतु दिनांक 30 सितम्बर 2028 से पूर्व प्राप्त नवीनीकरण आवेदन, गैस सिलेण्डर्स नियम, 2016 के नियम 55(7) के अनुसार विलंब शुल्क के साथ ही विचाराधीन होगा । दिनांक 30 सितम्बर 2028 तक कोई नवीनीकरण आवेदन प्राप्त नही होने की स्थिति में यह अनुज्ञप्ति स्वतः निरस्त हो जाएगी । /Please note that application for renewal of the licence should be submitted so as to reach the The Jt. Chief Controller of Explosives, Vadodara Circle, Vadodara before the licence expires (i.e. on or before 30th Septemebr, 2027) as required under Rule 55(5) of Gas Cylinders Rules, 2016. Application for renewal of licence received after 30th Septemebr, 2027 but not later than 30th September, 2028 shall be considered only with late fee applicable vide Rule 55(7) (a)(b) of said Rules. The licence will automatically expire if no application is received upto 30th Septemebr, 2028 .

कृपया इस पत्र की प्राप्ति की पावती दें/ Please acknowledge the receipt of the same.

भवदीय /Yours faithfully,

((आर.वेणुगोपाल)
(Dr. R.Venugopal))
संयुक्त मुख्य विस्फोटक नियंत्रक
Jt. Chief Controller of Explosives
वडोदरा/Vadodara

[अधिक जानकारी जैसे आवेदन की स्थिति, शुल्क तथा अन्य विवरण के लिए कृपया हमारी वेबसाइट http://peso.gov.in देखें ।]
(For more information regarding status,fees and other details please visit our website http://peso.gov.in)

Note:-This is system generated document does not require physical signature.

फार्म ई /FORM E

नियम 50,51 और 54 देखें /(See Rules 50, 51 and 54)

सिलेंडरों में संपीड़ित गैस भरने के लिए अनुज्ञप्ति / Licence to fill compressed gas in cylinders

अनुज्ञप्ति संख्यास/ Licence No. : **G/HO/GJ/05/591(G22655)** वार्षिक शुल्का रू/ Fee Rs.5000/- per year

M/S GUJARAT FLUOROCHEMICALS LIMITED, 12/A GIDC DAHEJ INDUSTRIAL ESTATE, TAL.VAGRA, Village/Town: Ambetha, City: Bharuch, Taluka: Vagra, District: BHARUCH, State: Gujarat, Pin: 392130 , को नीचे वर्णित और रेखांक संख्या **G/HO/GJ/05/591(G22655)** dated **03/08/2007** में दर्शित किए गए अनुज्ञप्त परिसर में, भारतीय विस्फोटक अधिनियम, 1884 (1884 का 4) और उसके अधीन बनाए गए नियमों के उपबंधों तथा इस अनुज्ञप्ति की अन्य शर्तों के अधीन रहते हुए, केवल संपीड़ित गैस से भरे सिलेण्डरों को रखने के लिए ही विधिमान्य अनुज्ञप्ति दी जाती है। / Licence is hereby granted to **M/S GUJARAT FLUOROCHEMICALS LIMITED, 12/A GIDC DAHEJ INDUSTRIAL ESTATE, TAL.VAGRA, Village/Town: Ambetha, City: Bharuch, Taluka: Vagra, District: BHARUCH, State: Gujarat, Pin: 392130** valid only for the filling of cylinders with compressed gas in the licensed premises described below and shown in the plan No. **G/HO/GJ/05/591(G22655)** dated **03/08/2007** subject to the provisions of the Explosives Act, 1884(4 of 1884) and the rules made thereunder and to the further conditions of this licence.

यह अनुज्ञप्ति 30 सितम्बर **2027** तक प्रवृत्त रहेगी । / The Licence shall remain in force till the **30th September 2027.**

For Chief Controller of Explosives
Nagpur
कृते मुख्य विस्फोटक नियंत्रक
नागपुर

August 3, 2007

1)Amendment dated - 17/04/2008

अनुज्ञप्त परिसर का विवरण और अवस्थिति / DESCRIPTION AND LOCATION OF THE LICENSED PREMISES

निम्नलिखित विवरण के अनुसार सिलेण्डरों में गैस भरने के लिए अनुज्ञप्त परिसर, जिसकी अभिन्यास सीमाओं और अन्य विशिष्टियों को संलग्न अनुमोदित रेखांक सं. **G/HO/GJ/05/591** dated **August 3, 2007** में दिखाया गया है,| **Dahej** में अवस्थित है और जिसमें अन्य सुविधाओं से जोडे गए **CHLORINE - 6 Nos.(1x6)** फिलिंग पॉइन्ट्स है । / The licensed premises, the layout boundaries and other particulars of which are shown in the attached approved plan No **G/HO/GJ/05/591** dated **August 3, 2007** are situated at **Dahej** and consists of **CHLORINE - 6 Nos.(1x6)** filling points with connected other feciilties for filling of the gas(es) in cylinders as described here under:

	गैस का प्रकार Type of Gas	मात्रा /Quantity
a)	विषैले/ Toxic	CHLORINE
b)	गैर विषैले और गैर ज्वलनशील /Non-Toxic and Non Flammable	--NIL--
c)	गैर विषैले और ज्वलनशील /Non-Toxic and Flammable	--NIL--
d)	घुलित एसिटिलीन गैस /Dissolved Acetylene Gas	--NIL--
e)	एलपीजी के अलावा गैर विषैले और ज्वलनशील द्रवित गैस /Non-Toxic & Flammable liquefiable gas other than LPG	--NIL--
f)	एलपीजी/ Liquefied Perloleum Gas	--NIL--

और प्लाट संख्या PlotNo :**12/A** गली का नाम : **GIDC Estate Taluka Vagra** गांव : **Dahej** पुलिस थाना : जिला :**BHARUCH** राज्य: **Gujarat.** /and is situated at PlotNo :**12/A** Name of Street :**GIDC Estate Taluka Vagra** Village/Town :**Dahej** Police Station : District : **BHARUCH, State: Gujarat.**

नवीकरण के पृष्ठांकन के लिए स्थान / SPACE FOR ENDORSEMENT OF RENEWALS

	नवीकरण की तारीख/Date of Renewal	समाप्ति की तारीख/Date of Expiry	अनुज्ञप्ति प्राधिकारी के हस्ताक्षर/Signature and stamp of the licensing authority
इस अनुज्ञप्ति को, विस्फोटक अधिनियम, 1884 या उसके अधीन बनाए गए गैस सिलेण्डर नियम, 2016 के उपबंधों या इस अनुज्ञप्ति की शर्तों का उल्लंघन न होने की दशा में, फीस में कोई छूट दिए बिना दस वर्ष तक नवीकृत किया जाएगा । /This licence shall be renewable without any concession in fee for ten years in the absence of contravention of the provision of the Explosives Act, 1884, or Gas Cylinders Rules, 2016, framed thereunder or of the conditions of the licence	**10/10/2022**	**30/09/2027**	**Dr. R.Venugopal** **JCCE** **For Jt. Chief Controller of Explosives** **Vadodara**

यदि अनुज्ञप्त परिसर इससे उपाबद्ध विवरण और शर्तों के अनुरुप नहीं पाया जाता है और जिन नियमों और शर्तों के अधीन यह अनुज्ञप्ति दी गई है, उनमे से किसी का उल्लंघन होता है तो यह अनुज्ञप्ति रद्द की जा सकती है और अनुज्ञप्ति का धारक कारावास से, जिसकी अवधि दो वर्ष तक की हो सकेगी, या जुर्माने से, जो तीन हजार रुपये तक का हो सकेगा, या दोनों से, दण्डनीय भी होगा । / This licence is liable to be cancelled if the licenced premises are not found conforming to the description and conditions attached hereto and contravention of any of the rules and conditions under which this licence is granted and the holder of this licence is also punishable with imprisonment for the term which may extend to two years or with fine which may extend to three thousand rupees or with both.

गैस सिलेंडर नियम, 2016 के अधीन विषाक्त गैस कंटेनरों / सिलेंडर के भरण एवं भंडारण के लिए अतिरिक्त शर्तों/ADDITIONAL CONDITIONS FOR FILLING AND OR STORAGE OF TOXIC GASES CONTAINERS/CYLINDERS UNDER GAS CYLINDEDRS RULES, 2016.

1. परिसर में परिचालन स्विच के साथ एक प्रभावशाली अलार्म प्रणाली की व्यवस्था की जाएगी। आपात स्थिति में, परिसर में स्विच ऑपरेट करने पर नियंत्रण कक्ष में अलार्म सुना जा सकेगा।/An efficient alarm system with operating switch in the premises shall be provided. In case of emergency, the alarm can be heard in the control room by operating the switch in the premises.
2. विषाक्त गैस के रिसाव की आपात स्थिति के लिए एक आपदा प्रबंधन योजना तैयार की जाएगी। योजना द्वारा संबंधित अधिकारी की जिम्मेपदारी तय की जाएगी, जिन्हें रिसाव की स्थिति में विषाक्त गैस उपकरणों को संचालित करने के विभिन्न पहलुओं के बारे में प्रशिक्षित किया जाएगा।/A Disaster Management Ptan for operation in case of emergency of leakage of toxic gas shall be prepared. The ptan shall fix responsibility on the concerned officers who shall be trained in the different aspects of handling toxic gas equipments in case of leakage.
3. आपात स्थिति में उपयोग के लिए परिसर में या इसके पास एक या अधिक पर्याप्त दबाव के हायड्रंट पॉइंट्स उपलब्ध कराए जाएंगे।/One or more hydrant point(s) with adequate pressure shall be provided in or near the premises for use in emergency.
4. परिसर में कम से कम दो आत्म निहित श्वास तंत्र (सेल्फ कंटैंड ब्रीदिंग अॅपरेटस) और दो कनस्तर प्रकार के गैस मास्क सहज सुलभ स्थान में रखे जाएंगे ।/At least two numbers self contained breathing apparatus and two Canister type Gas Masks shall be kept in the premises in a readily

फार्म एफ /FORM F

नियम 50,51 और 54 देखें /(See Rules 50, 51 and 54)

Licence to store compressed gas in cylinders

अनुज्ञप्ति संख्या/ Licence No. : **G/HO/GJ/06/580(G22655)** वार्षिक शुल्का रू/Fee Rs. **4000/-** per year

M/S GUJARAT FLUOROCHEMICALS LIMITED, 12/A GIDC DAHEJ INDUSTRIAL ESTATE, TAL.VAGRA, Village/Town: Ambetha, City: Bharuch, Taluka: Vagra, District: BHARUCH, State: Gujarat, Pin: 392130 को नीचे वर्णित और रेखांक संख्या **G/HO/GJ/06/580(G22655)** dated **03/08/2007** में दर्शित किए गए अनुज्ञप्त परिसर में, भारतीय विस्फोटक अधिनियम, 1884 (1884 का 4) और उसके अधीन बनाए गए नियमों के उपबंधों तथा इस अनुज्ञप्ति की अन्य शर्तों के अधीन रहते हुए, केवल संपीड़ित गैस से भरे सिलेण्डरों को रखने के लिए ही विधिमान्य अनुज्ञप्ति दी जाती है। /

Licence is hereby granted to **M/S GUJARAT FLUOROCHEMICALS LIMITED, 12/A GIDC DAHEJ INDUSTRIAL ESTATE, TAL.VAGRA, Village/Town: Ambetha, City: Bharuch, Taluka: Vagra, District: BHARUCH, State: Gujarat, Pin: 392130** valid only for the possession of cylinders filled with compressed gas in the licensed premises described below and shown in the plan No **G/HO/GJ/06/580(G22655)** dated **03/08/2007** subject to the provisions of the Explosives Act, 1884(4 of 1884) and the Rules made thereunder and to the further conditions of this licence.

यह अनुज्ञप्ति 30 सितम्बर 2027 तक प्रवृत्त रहेगी । / The Licence shall remain in force till the **30th September 2027.**

For Chief Controller of Explosives
Nagpur
कृते मुख्य विस्फोटक नियंत्रक
नागपुर

August 3, 2007

अनुज्ञप्त परिसर का विवरण और अवस्थिति / DESCRIPTION AND LOCATION OF THE LICENSED PREMISES

निम्नलिखित विवरण के अनुसार सिलेण्डरों में भरी गैस रखने के लिए अनुज्ञप्त परिसर, जिसकी अभिन्यास सीमाओं और अन्य विशिष्टियों को संलग्न अनुमोदित रेखांक सं **G/HO/GJ/06/580** dated **August 3, 2007** में दिखाया गया है, में अवस्थित है और जिसमें एक भण्डारण शेड है। / The licensed premises, the layout boundaries and other particulars of which are shown in the attached approved plan No. **G/HO/GJ/06/580** dated **August 3, 2007** are situated at Dahej and consists of a storage shed for possession of the gas contained in cylinders as described here under:

	गैस का प्रकार /Type of Gas	मात्रा /Quantity
a)	विषैले/ Toxic	CHLORINE - 136 Nos.
b)	गैर विषैले और गैर ज्वलनशील /Non-Toxic and Non Flammable	--NIL--
c)	गैर विषैले और ज्वलनशील /Non-Toxic and Flammable	--NIL--
d)	घुलित एसिटिलीन गैस /Dissolved Acetylene Gas	--NIL--
e)	एलपीजी के अलावा गैर विषैले और ज्वलनशील द्रवित गैस /Non-Toxic & Flammable liquefiable gas other than LPG	--NIL--
f)	एलपीजी/ Liquefied Petroleum Gas	--NIL--

और प्लाट संख्या PlotNo : **12/A** गली का नाम गाँव : **Dahej** या नगर पुलिस थाना : जिला : **BHARUCH**,राज्य : **Gujarat.**
/ and Is situated at PlotNo : **12/A** Village/Town :**Dahej** Police Station : District : **BHARUCH**, State: **Gujarat.**

नवीकरण के पृष्ठांकन के लिए स्थान / SPACE FOR ENDORSEMENT OF RENEWALS

	नवीकरण की तारीख/Date of Renewal	समाप्ति की तारीख/Date of Expiry	अनुज्ञप्ति प्राधिकारी के हस्ताक्षर/Signature and stamp of the licensing authority
इस अनुज्ञप्ति को, विस्फोटक अधिनियम, 1884 या उसके अधीन बनाए गए गैस सिलेण्डर नियम, 2016 के उपबंधों या इस अनुज्ञप्ति की शर्तों का उल्लंघन न होने की दशा में, फीस में कोई छूट दिए बिना दस वर्ष तक नवीकृत किया जाएगा ।/This licence shall be renewable without any concession in fee for ten years in the absence of contravention of the provision of the Explosives Act,1884 or Gas Cylinders Rules, 2016, framed thereunder or of the conditions of the licence	**10/10/2022**	**30/09/2027**	**Dr. R.Venugopal JCCE For Jt. Chief Controller of Explosives Vadodara**

यदि अनुज्ञप्त परिसर इससे उपाबद्ध विवरण और शर्तों के अनुरूप नहीं पाया जाता है और जिन नियमों और शर्तों के अधीन यह अनुज्ञप्ति दी गई है, उनमे से किसी का उल्लंघन होता है तो यह अनुज्ञप्ति रद्द की जा सकती है और अनुज्ञप्ति का धारक कारावास से, जिसकी अवधि दो वर्ष तक की हो सकेगी, या जुर्माने से, जो तीन हजार रुपये तक का हो सकेगा, या दोनों से, दण्डनीय भी होगा । / This licence is liable to be cancelled if the licenced premises are not found conforming to the description and conditions attached hereto and contravention of any of the rules and conditions under which this licence is granted and the holder of this licence is also punishable with imprisonment for the term which may extend to two years or with fine which may extend to three thousand rupees or with both.

गैस सिलेंडर नियम, 2016 के अधीन विषाक्त गैस कंटेनरों / सिलेंडर के भरण एवं भंडारण के लिए अतिरिक्त शर्तों/ADDITIONAL CONDITIONS FOR FILLING AND OR STORAGE OF TOXIC GASES CONTAINERS/CYLINDERS UNDER GAS CYLINDEDRS RULES, 2016.

1. परिसर में परिचालन स्विच के साथ एक प्रभावशाली अलार्म प्रणाली की व्यवस्था की जाएगी। आपात स्थिति में, परिसर में स्विच ऑपरेट करने पर नियंत्रण कक्ष में अलार्म सुना जा सकेगा।/An efficient alarm system with operating switch in the premises shall be provided. In case of emergency, the alarm can be heard in the control room by operating the switch in the premises.
2. विषाक्त गैस के रिसाव की आपात स्थिति के लिए एक आपदा प्रबंधन योजना तैयार की जाएगी। योजना द्वारा संबंधित अधिकारी की जिम्मेपदारी तय की जाएगी, जिन्हें रिसाव की स्थिति में विषाक्त गैस उपकरणों को संचालित करने के विभिन्न पहलुओं के बारे में प्रशिक्षित किया जाएगा।/A Disaster Management Plan for operation in case of emergency of leakage of toxic gas shall be prepared. The plan shall fix responsibility on the concerned officers who shall be trained in the different aspects of handling toxic gas equipments in case of leakage.
3. आपात स्थिति में उपयोग के लिए परिसर में या इसके पास एक या अधिक पर्याप्त दबाव के हायड्रंट पॉइंट्स उपलब्ध कराए जाएंगे।/One or more hydrant point(s) with adequate pressure shall be provided in or near the premises for use in emergency.
4. परिसर में कम से कम दो आत्म निहित श्वास तंत्र (सेल्फ कंटेंड ब्रीदिंग अॅपरेटस) और दो कनस्तर प्रकार के गैस मास्क सहज सुलभ स्थान में रखे जाएंगे ।/At least two numbers self contained breathing apparatus and two Canister type Gas Masks shall be kept in the premises in a readily

भारत सरकार/Government of India
वाणिज्य और उद्योग मंत्रालय/Ministry of Commerce & Industry
पेट्रोलियम तथा विस्फोटक सुरक्षा संगठन (पैसो) /Petroleum & Explosives Safety Organisation (PESO)
9वीं मंजिल, पार्क पैराडाइज, वडसर
वडोदरा- 390012
9th Floor, Park Paradise, Vadsar,
Vadodara - 390012

ई-मेल:/E-mail :
jtcce.vadodara@explosives.gov.in
फोन / फ़ैक्स नंबर:/Phone/Fax No : 0265 - 2361035

अनुज्ञप्ति सं./No : S/HO/GJ/03/944(S31609)

दिनांक/Dated : 22/08/2023

सेवा में/To,

M/S. GUJARAT FLUOROCHEMICALS LTD,
12/A GIDC DAHEJ INDUSTRIAL ESTATE,
DAHEJ TAL VAGRA,
dahej,
DAHEJ,
Taluka: DAHEJ,
District: AHMEDABAD,
State: Gujarat
PIN: 392130

विषय :/Sub : **Plot No, Plot No. 12A, GIDC Estate Area,, DAHEJ TAL VAGRA, Vagra, Taluka: Vagra, District: BHARUCH, State: Gujarat, PIN: 391230 स्थित LIQUID NITROGEN, गैस के संपीडित पात्र / पात्रों में भंडारण के लिए स्थिर एवं गतिशील दाब पात्र (अज्वलित) नियम, 2016 के अधीन स्वीकृत अनुज्ञप्ति संख्या S/HO/GJ/03/944 के नवीनीकरण संबंध में /Storage of NLIQUID NITROGEN gas in pressure vessels at Plot No, Plot No. 12A, GIDC Estate Area,, DAHEJ TAL VAGRA, Vagra, Taluka: Vagra, District: BHARUCH, State: Gujarat, PIN: 391230 - Licence No : S/HO/GJ/03/944 grant in form LS-1A of SMPV(U) Rules, 2016-Renewal of Licence Regarding**

महोदय/Sir(s),

कृपया आपके दिनांक : 18/08/2023 के पत्र संख्या: **OIN1413741** का संदर्भ ग्रहण करें ।/Please refer to your application No.**OIN1413741** dated 18/08/2023 .

अनुज्ञप्ति संख्या : **S/HO/GJ/03/944** का नवीकरण दिनांक 30th सितंबर 2028 तक कर इसके साथ अग्रेषित की जा रही हैं ।
Licence Number: **S/HO/GJ/03/944** is renewed and is valid upto **30th September 2028** is forwarded herwith.

दिनांक 30/09/**2028** . से आगे अनुज्ञप्ति नवीनीकरण हेतु उपरोक्त नियम के नियम 55 के प्रावधानों का पालन किया जाएं । विलंब शुल्क से बचने हेतु शुल्क के साथ मूल अनुज्ञप्ति तथा अन्य दस्तावेज अधिकतम दिनांक : 30 सितंबर, **2028** तक **The Jt. Chief Controller of Explosives, Vadodara Circle, Vadodara** में जरूर पहुंच जाने चाहिए ।
The provisions of the Rule 55 of the above said rules shall be followed for further renewal of the licence beyond 30/9/**2028.** The renewal application along with fees, Original licence and other documents shall reach in the Office of **The Jt. Chief Controller of Explosives, Vadodara Circle, Vadodara**, latest by 30th September,**2028** to avoid late fee.

कृपया अनुज्ञप्ति प्राप्ति की पावती दें ।/Please acknowledge the receipt of the licence.

भवदीय/Yours faithfully,

((आर.वेणुगोपाल)
(Dr. R.Venugopal))
संयुक्त मुख्य विस्फोटक नियंत्रक
Jt. Chief Controller of Explosives
वडोदरा/Vadodara

संयुक्त मुख्य विस्फोटक नियंत्रक, वडोदरा
Joint Chief Controller of Explosives,Vadodara

(अधिक जानकारी जैसे आवेदन की स्थिति, शुल्क तथा अन्य विवरण के लिए हमारी वेबसाइट : http://peso.gov.in देखें)
(For more information regarding status,fees and other details please visit our website http://peso.gov.in)

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FORM LS-1A/प्ररुप - एलएस–1क
(See Rules 50, 51, 54 and 55)/(नियम 50 , 51, 54 और 55 देखें)
Licence to Store Compressed gas in pressure vessel or vessels
दाब पात्र या पात्रों में संपीड़ित गैस भण्डारकरण के लिए अनुज्ञप्ति

अनुज्ञप्ति सं/Licence No. : **S/HO/GJ/03/944(S31609)** फीस रुपए/Fee Rs. **50000**/- per year/प्रति वर्ष

Licence is hereby granted to M/S. GUJARAT FLUOROCHEMICALS LTD, 12/A GIDC DAHEJ INDUSTRIAL ESTATE, DAHEJ TAL VAGRA ,dahej,DAHEJ, Taluka: DAHEJ, District: AHMEDABAD, State: Gujarat PIN: 392130 valid only for the storage of compressed gas in 3 Number(s) of pressure vessels as indicated below in the licensed premises described below and shown in the plan No.S/HO/GJ/03/944(S31609) dated 07/04/2015 subject to the provisions of the Indian Explosives Act, 1884 (4 of 1884) and the rules made thereunder and to the further conditions of this licence.

श्री M/S. GUJARAT FLUOROCHEMICALS LTD, 12/A GIDC DAHEJ INDUSTRIAL ESTATE, DAHEJ TAL VAGRA ,dahej,DAHEJ, Taluka: DAHEJ, District: AHMEDABAD , State: Gujarat PIN: 392130 को नीचे वर्णित अनुज्ञप्त परिसरों में और रेखांकन संख्या S/HO/GJ/03/944(S31609) dated 07/04/2015 में भारतीय विस्फोटक अधिनियम, 1884 (1884 का 4) और उसके अधीन बनाए गए नियमों तथा इस अनुज्ञप्ति की अन्य शर्तों पर 3 दाब पात्र / पात्रों में संपीड़ित गैस के भण्डारण के लिए अनुज्ञप्ति मंजूर की जाती है।

यह अनुज्ञप्ति 30 सितंबर 2028 तक प्रवृत्त रहेगी।
The Licence shall remain in force till the **30th September2028.**

Vessel No./वेसल नंबर	Name of Gas/ गैस का नाम	State of Gas/ गैस की स्थिति	Water Capacity in cubic meter/ जल क्षमता (घ.मी.)	Max. working Pre.(kg/cm^2)/ अधिकतम वर्किंग प्रेशर	Quantity Granted in kgs(Liquified gas)/किलोग्रॅम में जारी मात्रा (लिक्विफाईड गैसेस)
604/5 Model V2124DC	LIQUID NITROGEN	Liquified	19.38	24	14000
1011021179/1	LIQUID NITROGEN	Liquified	3.69	37.72	2660
1011221146/1	LIQUID NITROGEN	Liquified	40.39	27.53	29079
Total Water capacity			**63.46**		

April 19, 2007

For Chief Controller of Explosives
HQ, Nagpur
कृते मुख्य विस्फोटक नियंत्रक
नागपुर

1). Amendment dated - 13/08/2007
2). Amendment dated - 22/11/2011
3). Amendment dated - 23/08/2019

DESCRIPTION AND LOCATION OF THE LICENSED PREMISES/अनुज्ञप्त परिसर का विवरण और अवस्थिती

The licensed premises, the layout boundaries and other particulars of which are shown in the attached approved plan No. S/HO/GJ/03/944 dated 07/04/2015 are situated at VagraDAHEJ TAL VAGRA and consists of 3 Number(s) vessel(s) for storage of :/अनुज्ञप्त परिसर, प्रदर्शित सीमा और अन्य विवरण जो संलग्न अनुमोदित रेखाचित्र क्र.S/HO/GJ/03/944 दिनांक 07/04/2015 में दर्शाए गए है VagraDAHEJ TAL VAGRA पर स्थित है और इसमे 3 वेसल सम्मिलित है।

a) Flammable/Corrosive/Toxic Gases :/ज्वलनशील / संक्षारक / विषैली गैसों:

b) Non-Toxic Gases :/अविषैली गैसों : LIQUID NITROGEN

and is situated at PlotNo : Plot No. 12A, Village/Town : VagraDAHEJ TAL VAGRA, Police Station : Dahej, District : BHARUCH, State : Gujarat , Pin : 391230.
/प्लाट संख्या PlotNo : Plot No. 12A, गांव या नगर : VagraDAHEJ TAL VAGRA, पुलीस थाना : Dahej, जिला : BHARUCH, राज्य : Gujarat , Pin : 391230 में स्थित है।

SPACE FOR ENDORSEMENT OF RENEWALS/नवीकरण के पृष्ठांकन के लिए स्थान

		Date of Expiry/	Signature and stamp of the

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	Date of Renewal/ नवीकरण की तारीख	Date of Expiry/ अनुज्ञप्ति की समाप्ति की तारीख	licensing authority/अनुज्ञापन प्राधिकारी के हस्ताक्षर और कार्यालय की मुद्रा
This licence shall be renewable without any concession in fee for three years in the absence of contravention of the provision of the Indian Explosives Act, 1884, or the Static and Mobile Pressure Vessles (Unfired) Rules,2016, framed thereunder or of the conditions of the licence./अनुज्ञप्ति, भारतीय विस्फोटक अधिनियम, 1884 या उसके अधीन अधीन बनाए गए स्थिर एवं गतिशील दाब पात्र (अज्वलित) नियम, 2016 या इस अनुज्ञप्ति की शर्तों का उल्लंघन न होने की दशा में, फीस में बिना किसी छूट के तीन वर्ष तक नवीकृत की जाएगी।	22/08/2023	30/09/2028	Dr. R.Venugopal JCCE For Jt. Chief Controller of Explosives Vadodara संयुक्त मुख्य नियंत्रक विस्फोटक वडोदरा Joint Chief Controller of Explosives, Vadodara

This licence is liable to be cancelled if the licenced premises are not found conforming to the description and conditions attached hereto and contravention of any of the rules and conditions under which this licence is granted and the holder of this licence is also punishable with imprisonment for the term which may extend to two years or with fine which may extend to three thousand rupees or with both./यदि निरीक्षण के समय अनुज्ञप्त परिसर इससे उपाबद्ध विवरण और शर्तों के अनुरुप नहीं पाया जाता है और जिन नियमों और शर्तों के अधीन यह अनुज्ञप्ति मंजूर की गई है, उनमे से किसी का उल्लंघन होता है तो उस दशा में यह अनुज्ञप्ति रद्द की जा सकती है और अनुज्ञप्ति का धारक कारावास से, जिसकी अवधि दो वर्ष तक की हो सकेगी, या जुर्माने से, जो तीन हजार रुपये तक का हो सकेगा, या दोनों से दण्डनीय भी होगा।

Note:-This is system generated document does not require physical signature.

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FORM LS-1A/प्ररुप - एलएस–1क
(See Rules 50, 51, 54 and 55)/(नियम 50 , 51, 54 और 55 देखें)
Licence to Store Compressed gas in pressure vessel or vessels
दाब पात्र या पात्रों में संपीड़ित गैस भण्डारकरण के लिए अनुज्ञप्ति

अनुज्ञप्ति सं/Licence No. : **S/HO/GJ/03/1705(S66174)** फीस रुपए/Fee Rs. **30000/-** per year/प्रति वर्ष

Licence is hereby granted to M/s. Gujarat Fluorochemcals Limited, 12/A GIDC Dahej Industrial Estate Tal. Vagra, 12/A GIDC Dahej Industrial Estate Tal. Vagra ,Vagra,Vagra, Taluka: Vagra, District: BHARUCH , State: Gujarat PIN: 392130 valid only for the storage of compressed gas in 1 Number(s) of pressure vessels as indicated below in the licensed premises described below and shown in the plan No.S/HO/GJ/03/1705(S66174) dated 17/02/2022 subject to the provisions of the Indian Explosives Act, 1884 (4 of 1884) and the rules made thereunder and to the further conditions of this licence.

श्री M/s. Gujarat Fluorochemcals Limited, 12/A GIDC Dahej Industrial Estate Tal. Vagra, 12/A GIDC Dahej Industrial Estate Tal. Vagra ,Vagra,Vagra, Taluka: Vagra, District: BHARUCH , State: Gujarat PIN: 392130 को नीचे वर्णित अनुज्ञप्त परिसरों में और रेखांकन संख्या S/HO/GJ/03/1705(S66174) dated 17/02/2022 में भारतीय विस्फोटक अधिनियम, 1884 (1884 का 4) और उसके अधीन बनाए गए नियमों तथा इस अनुज्ञप्ति की अन्य शर्तों पर 1 दाब पात्र / पात्रों में संपीड़ित गैस के भण्डारण के लिए अनुज्ञप्ति मंजूर की जाती है।

यह अनुज्ञप्ति 30 सितंबर 2028 तक प्रवृत्त रहेगी।
The Licence shall remain in force till the **30th September2028.**

Vessel No./वेसल नंबर	Name of Gas/गैस का नाम	State of Gas/ गैस की स्थिति	Water Capacity in cubic meter/ जल क्षमता (घ.मी.)	Max. working Pre.(kg/cm^2)/ अधिकतम वर्किंग प्रेशर	Quantity Granted in kgs(Liquified gas)/किलोग्रॅम में जारी मात्रा (लिक्विफाईड गैसेस)
V-709 (0542/3)	R-23 (Trifluoromethane)	Liquified	14.53	17	12009
Total Water capacity			**14.53**		

July 4, 2016

For Chief Controller of Explosives
HQ, Nagpur
कृते मुख्य विस्फोटक नियंत्रक
नागपुर

DESCRIPTION AND LOCATION OF THE LICENSED PREMISES/अनुज्ञप्त परिसर का विवरण और अवस्थिती

The licensed premises, the layout boundaries and other particulars of which are shown in the attached approved plan No. S/HO/GJ/03/1705 dated 17/02/2022 are situated at VagraDahej Taluk Vagra and consists of 1 Number(s) vessel(s) for storage of :/अनुज्ञप्त परिसर, प्रदर्शित सीमा और अन्य विवरण जो संलग्न अनुमोदित रेखाचित्र क्र.S/HO/GJ/03/1705 दिनांक 17/02/2022 में दर्शाए गए है VagraDahej Taluk Vagra पर स्थित है और इसमे 1 वेसल सम्मिलित है।

a) Flammable/Corrosive/Toxic Gases :/ज्वलनशील / संक्षारक / विषैली गैसों:

b) Non-Toxic Gases :/अविषैली गैसों : R-23 (Trifluoromethane)

and is situated at PlotNo : 12/A, Village/Town : VagraDahej Taluk Vagra, Police Station : Bharuch, District : BHARUCH, State : Gujarat , Pin : 391230.
/प्लाट संख्या PlotNo : 12/A, गांव या नगर : VagraDahej Taluk Vagra, पुलीस थाना : Bharuch, जिला : BHARUCH, राज्य : Gujarat , Pin : 391230 में स्थित है।

SPACE FOR ENDORSEMENT OF RENEWALS/नवीकरण के पृष्ठांकन के लिए स्थान

	Date of Renewal/ नवीकरण की तारीख	Date of Expiry/ अनुज्ञप्ति की समाप्ति की तारीख	Signature and stamp of the licensing authority/अनुज्ञापन प्राधिकारी के हस्ताक्षर और कार्यालय की मुद्रा
This licence shall be renewable without any concession in fee for three years in the			

भारत सरकार/Government of India
वाणिज्य और उद्योग मंत्रालय/Ministry of Commerce & Industry
पेट्रोलियम तथा विस्फोटक सुरक्षा संगठन (पैसो) /Petroleum & Explosives Safety Organisation (PESO)
9वीं मंजिल, पार्क पैराडाइज, वडसर
वडोदरा- 390012
9th Floor, Park Paradise, Vadsar,
Vadodara - 390012

ई-मेल:/E-mail :
jtcce.vadodara@explosives.gov.in
फोन / फ़ैक्स नंबर:/Phone/Fax No : 0265 - 2361035

अनुज्ञप्ति सं./No : S/HO/GJ/03/1705(S66174)

दिनांक/Dated : 22/08/2023

सेवा में/To,

M/s. Gujarat Fluorochemcals Limited,
12/A GIDC Dahej Industrial Estate Tal. Vagra,
12/A GIDC Dahej Industrial Estate Tal. Vagra,
Vagra,
Vagra,
Taluka: Vagra,
District: BHARUCH,
State: Gujarat
PIN: 392130

विषय :/Sub : **Plot No, 12/A, GIDC Industrial Estate, Dahej Taluk Vagra, Vagra, Taluka: Vagra, District: BHARUCH, State: Gujarat, PIN: 391230 स्थित R-23 (Trifluoromethane), गैस के संपीडित पात्र / पात्रों में भंडारण के लिए स्थिर एवं गतिशील दाब पात्र (अज्वलित) नियम, 2016 के अधीन स्वीकृत अनुज्ञप्ति संख्या S/HO/GJ/03/1705 के नवीनीकरण संबंध में /Storage of NR-23 (Trifluoromethane) gas in pressure vessels at Plot No, 12/A, GIDC Industrial Estate, Dahej Taluk Vagra, Vagra, Taluka: Vagra, District: BHARUCH, State: Gujarat, PIN: 391230 - Licence No : S/HO/GJ/03/1705 grant in form LS-1A of SMPV(U) Rules, 2016-Renewal of Licence Regarding**

महोदय/Sir(s),

कृपया आपके दिनांक : 18/08/2023 के पत्र संख्या: **OIN268345** का संदर्भ ग्रहण करें I/Please refer to your application No.**OIN268345** dated 18/08/2023 .

अनुज्ञप्ति संख्या : **S/HO/GJ/03/1705** का नवीकरण दिनांक 30th सितंबर 2028 तक कर इसके साथ अग्रेषित की जा रही हैं ।
Licence Number: **S/HO/GJ/03/1705** is renewed and is valid upto **30th September 2028** is forwarded herwith.

दिनांक 30/09/**2028** . से आगे अनुज्ञप्ति नवीनीकरण हेतु उपरोक्त नियम के नियम 55 के प्रावधानों का पालन किया जाएं । विलंब शुल्क से बचने हेतु शुल्क के साथ मूल अनुज्ञप्ति तथा अन्य दस्तावेज अधिकतम दिनांक : 30 सितंबर, **2028** तक **The Jt. Chief Controller of Explosives, Vadodara Circle, Vadodara** में जरूर पहुंच जाने चाहिए ।
The provisions of the Rule 55 of the above said rules shall be followed for further renewal of the licence beyond 30/9/**2028**. The renewal application along with fees, Original licence and other documents shall reach in the Office of **The Jt. Chief Controller of Explosives, Vadodara Circle, Vadodara**, latest by 30th September,**2028** to avoid late fee.

कृपया अनुज्ञप्ति प्राप्ति की पावती दें I/Please acknowledge the receipt of the licence.

भवदीय/Yours faithfully,

((आर.वेणुगोपाल)
(Dr. R.Venugopal))
संयुक्त मुख्य विस्फोटक नियंत्रक
Jt. Chief Controller of Explosives
वडोदरा/Vadodara

संयुक्त मुख्य विस्फोटक नियंत्रक, वडोदरा
Joint Chief Controller of Explosives,Vadodara

(अधिक जानकारी जैसे आवेदन की स्थिति, शुल्क तथा अन्य विवरण के लिए हमारी वेबसाइट : http://peso.gov.in देखें)
(For more information regarding status,fees and other details please visit our website http://peso.gov.in)

Note:-This is system generated document does not require signature.

COMPLIANCE REPORT WITH RESPECT TO ENVIRONMENTAL CLEARANCE

Name : **M/s. GUJARAT FLUOROCHEMICALS LIMITED,**
Location : Plot No.: 12/A, E-50/1, GIDC Dahej Industrial Estate Taluka Vagra, Dist.Bharuch-392130, Gujarat. India -392130
Reference : Environmental Clearance issued Vide letter no. – SEIAA/GUJ/EC/5(f)/662/2024, Dated 14/05/2024.

<table>
<tr><th>Sr. No.</th><th>EC Condition</th><th>Compliance Status</th></tr>
<tr><td></td><td>The proposal is for Environmental Clearance to M/s. Gujarat Fluorochemicals Ltd for setting up of expansion of manufacturing plant for 'Synthetic Organic Chemicals' at Plot No.:l2A, Plot No.: E-50/1, Dahej GIDC Estate, Tal.: Vagra, Dist.: Bharuch. lt is an existing unit for manufacturing following products, which falls in the category – 5(f) of the schedule of the EIA Notification-2006:
<table>
<tr><th>Sr. No.</th><th>Name of Products</th><th>CAS Number</th><th>Existing Quantity as per CC&A (MT/Month)</th><th>Proposed Extra (MT/Month)</th><th>Total (MT/ Month)</th><th>End Use</th></tr>
<tr><td colspan="7">A. Tetra Fluoro Ethylene (TFE) Based Products</td></tr>
<tr><td>1</td><td>Polytetra Fluoro Ethylene (PTFE) #</td><td>9002-84-0</td><td>1800</td><td rowspan="3">-926</td><td rowspan="3">3170</td><td>Polymer Product</td></tr>
<tr><td>2</td><td>Ethyl Tetra Fluoro Ethyl Ether (ETFEE)</td><td>512-51-6</td><td>400</td><td>Used as a Chemical Reagent in different chemical industries.</td></tr>
<tr><td>3</td><td>Pentafluoroethane (HFC -125)</td><td>354-33-6</td><td>417</td><td>Refrigerant, Fire Suppressing agent, HFC-125 can be used to protect a wide range of</td></tr>
</table></td><td>The proposed new products as well as the products of which the quantum has been increased will be complied with once we start their production.

The products whose quantity has not been changed are being manufactured as per the prescribed limit and hence are in compliance.</td></tr>
</table>

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Sr. No.	EC Condition							Compliance Status
							applications from sensitive electrical equipment to industrial applications. HFC125 fire suppression agent is used with Fike's total flooding systems.	
	4	HexaFluoro Propylene (HFP)	116-15-4	300			Monomer, Chemicals	
	5	Tetrafluoro Dimethyl Amine (TFE DMA)	1550-50-1	90			Speciality Chemical in different Process	
	6	Dichloropentafluoro Propane (HCFC-225)	135151-96-1	415			Refrigerant gas	
	7	Methyl Tetra Fluoro Ethyl Ether (MTFEE)	425-88-7	83			Used as a Speciality Chemical	
	8	1,1,3Trichlorotetrafluoropropane (HCFC 224ca)	53063-53-9	25			Speciality Chemical	

Sr. No.	EC Condition						Compliance Status
	9	Perfluoro Alkoxy (PFA)*	6358 5-09-1	200		Polymer for Pipes and pipe lining, water resistance sheets, valves Gaskets, Membrane, thin tube pipes, thick tube pipes, Medical Application as Graft Application, NonStick Pan and decorative crockery, Lubricants,	
	10	Fluorinated Ethylene Propylene (FEP)*	2506 7-11-2	250			
	11	Iodurate	354-65-4	1		Speciality Chemical	
	12	Tetra Fluoro Beta Sulfone	697-18-7	25			
	13	Tetra Fluoro Ethyl Ether (Propyl, butyl, TF Propyl)	512-51-6	80		Polymeric Chemical	
	14	Di Chloro Tetra Fluoroethoxy aniline	1041 47-32-2	10		Speciality Chemical	

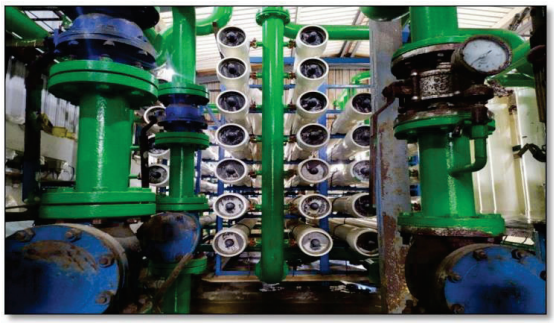
Sr. No.	EC Condition							Compliance Status
	15	Proton Exchange Membrane	--	0			Ion Exchange Membrane	
	Total (A)			**4096**	**-926**	**3170**		
	B. Vinylidene Fluoride (VDF) Based Products							
	16	Fluoro Elastomers (FKM)*/ FFKM/	5666-77-2	300	101	735	Polymer	
	17	Polyvenylidene Fluoride (PVDF)*	24937-79-9	250			Special Purpose Polymer	
	18	Intermediate Vinylidene Fluoride (VDF)	75-38-7	84			Monomer, Chemicals	
	Total (B)			**634**	**101**	**735**		
	C. Hexafluoro Propylene (HFP) Based Products							
	19	Perfluoro Propyl Vinyl Ether (PPVE)	1623-05-8	0	200	200	Polymer Catalyst	
	20	Hexa Fluoro Propylene Oxide (HFPO)	428-59-1	0			intermediate chemicals and monomer for fluoropolymers	
	Total (C)			**0**	**200**	**200**		
	D. Other Products							
	21	Carbon Dioxide-Food grade gas	124-38-9	2267	0	2267	Sale to soft drinks manufacturing Industry.	

Sr. No.	EC Condition							Compliance Status
	22	Carbon Dioxide-Dry Ice	124-38-9	533	0	533	For the manufacturing of Dry Ice	
	23	Chloroform	67-66-3	10090	0	10090	As a raw material for different chemical process.	
	24	Methylene Dichloride (MDC)	75-09-2	10090	0	10090		
	25	Carbon Tetrachloride (CTC)**	56-23-5	1440	0	1440		
	26	Sulphuric Acid (70%- 88%)	7664-93-9	713	0	713		
	27	Hydrochloric Acid (31 % +/- 1%)	7647-01-0	37992	0	37992		
	28	Caustic Soda (Dry Basis)	1310-73-2	15500	0	15500	As a raw material for different chemical process.	
	29	Chlorine Dry Basis	7782-50-5	13167	0	13167		
	30	Hydrogen	1333-74-0	464	0	464		
	31	Hydrochloric Acid (31% ± 1 %)	7647-01-0	357	0	357		
	32	Sodium hypochlorite (10% chlorine)	7681-52-9	132	0	132		
	33	Calcium Chloride	10043-52-4	4750	0	4750	As a raw material for different chemical process.	
	34	Dilute HF (20 %)	7664-39-3	1000	0	1000		
	35	High Boiler of Chloromethane	--	200	0	200		

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Sr. No.	EC Condition							Compliance Status
	36	DichloroFluoromethane (HCFC-21/R-21)	75-43-4	230	0	230	Refrigerant gas.	
	37	Tri fluoromethane	75-46-7	21	0	21	As a raw material for different chemical process.	
	38	Gypsum	13397-24-5	12768	0	12768		
	39	Hydrofluosilicic Acid (20%)	16961-83-4	200	0	200		
	40	2, 6- Dichloro-4-Trifluoro Methyl Aniline (DCTFMA)	24279-39-8	65	0	65	Speciality Chemical	
	41	Trifluoro Methyl Aniline (TFMA)	455-14-1	20	0	20		
	42	I-SAN	--	20	0	20		
	43	Poly Chloro Tri Fluoro Ethylene (PCTFE)	9002-83-9	4	0	4	Polymer	
	44	C4 to C34 Surfactant (Non-fluorinated)	11024-24-1	10	0	10	Polymer Additives	
	45	R&D Products	--	10	0	10	New Development	
	46	Mono Chloro Difluoro Methane (R-22)	75-45-6	1100	0	1100	Refrigerant Gas	
	47	1,6-Divinylperfluorohexane (C6DV)	1800-91-5	0	100	100	Battery Chemical	
	48	Lithium Ferrous Phosphate-$LiFePO_4$ (LFP)	15365-14-7	0	500	500		
	49	Potassium Fluoride	7789-23-3	0	872	872	As a raw material for different	
	50	Potassium Iodide	7681-11-0	0	150	150		

Sr. No.	EC Condition	Compliance Status
	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td>chemical process.</td></tr><tr><td></td><td>Total (D)</td><td></td><td>113143</td><td>1622</td><td>114765</td><td></td></tr><tr><td></td><td>Total (A+B+C+D)</td><td></td><td>117873</td><td>997</td><td>118870</td><td></td></tr><tr><td>51</td><td>Gas Based COGEN</td><td></td><td rowspan="2">54.5 MW</td><td rowspan="2">0</td><td rowspan="2">54.5 MW</td><td></td></tr><tr><td>52</td><td>Coal Base COGEN</td><td></td><td></td></tr><tr><td>53</td><td>Gas Base CCGT</td><td></td><td>37 MW</td><td>0</td><td>37 MW</td><td></td></tr><tr><td></td><td>Total</td><td></td><td>91.5 MW</td><td></td><td>91.5 MW</td><td></td></tr></table>	
A.	SPECIFIC CONDITIONS	
1.	PP shall carry out CER activity of their project cost, as per their submission vide OM of MoEF & CC dated 1.5.2018 and its amendment of Rs 121 Lakhs.	We have noted the same and are complying with the said condition.
2.	PP shall provide total Green area of 33 % as per their submission.	Complied. Unit has green belt development with layout plan and of green belt area covered. Greenbelt development layout attached as per **Annexure: I.** Details attached for the plantation for next three years attached as Annexure: I.
3.	PP shall provide STP having capacity of 60 KLD for treatment of domestic wastewater	We have provided the STP of 60 KLD capacity. 
4.	PP shall provide ETP having capacity of ETP-1 ('100 KLD Existing), EIP-2 (24OO KLD Existing), ETP-3 (350 KLD Existing), ETP-4 (764 KLD Existing), ETP-5 (985 KLD Existing), ETP-6 (552 KLD Existing), ETP- 7 (1000 KLD Proposed) for treatment of domestic wastewater.	Unit has well established ETP and RO system to achieve the GPCB/CPCB/MoEF& CC norms.

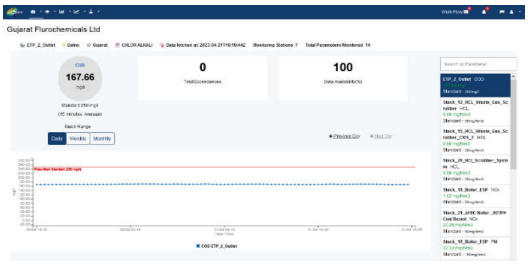
Sr. No.	EC Condition	Compliance Status
		 
5.	Proponent shall provide all fire prevention and safety measures for fire control, even though fire NOC is not Mandatory of labour and skilled department, to control & prevent industrial accident.	We have provided the requisite fire prevention and safety measures for fire control like -Trained fire fighter available at site 24 X 7. -Fire Hydrant system. -Spray System -Full-fledged Emergency Control Centre and 03 nos. of Fire tenders. -Fire water storage tank of 60000 m3. -Firefighting foam available at site.
6.	Project Proponent shall send any hazardous waste to those users, who had obtained necessary GPCB Permissions under Rule-9 of Hazardous waste rule 2016 & its	Complied 1. Unit has authorization for collection, storage and disposal of hazardous waste under the Hazardous Waste

<table>
<tr><th>Sr. No.</th><th>EC Condition</th><th>Compliance Status</th></tr>
<tr><td></td><td>amendment etc. PP shall maintain complete records for sending of hazardous waste in this regard.</td><td>(Management, Handling and Trans- Boundary Movement) Rules, 2016 valid up to 15/02/2027.
2. Site has valid membership of TSDF operated by BEIL Ltd, Dahej
Recycling Solutions Pvt. Ltd. (RSPL) for disposal of hazardous waste.</td></tr>
<tr><td>7.</td><td>Proponent shall submit approved conservation plan from competent authority for schedule I species, as per their submission having total conservation budget of Rs 10,87,000.</td><td>We have submitted the copy of conservation plan to the Wildlife Department of Gujarat. Please refer to Annexure-2.</td></tr>
<tr><td>8.</td><td>Proponent shall strictly comply all EC conditions issued by order dated 01.11.2018.</td><td>We have noted the same and are complying with the said condition.</td></tr>
<tr><td>9.</td><td>For Concentrated Stream (1002 KLD), generated from process shall be treated in ETP-1, ETP-3 and ETP-6 and Treated effluent shall be discharged into deep sea through own 5 MLD pipeline.</td><td>The existing treated effluent is being discharged into deep sea which is within the stipulated norms.
<table><tr><th>Month</th><th>Wastewater Discharge quantity (KL/Month)</th></tr><tr><td>October-2024</td><td>81342</td></tr><tr><td>November-2024</td><td>76653</td></tr><tr><td>December-2024</td><td>78064</td></tr><tr><td>January-2025</td><td>77400</td></tr><tr><td>February-2025</td><td>70729</td></tr><tr><td>March-2025</td><td>77430</td></tr></table>
The proposed additional quantity of treated wastewater will also be discharged into deep sea once we start production of the proposed products.</td></tr>
<tr><td>10.</td><td>PP shall submit necessary permission for disposal of treated effluent to be disposed to deep sea through own 5 MLD pipeline within 10 days' time period issued by competent authority for conveyance of treated effluent.</td><td>We have our own 5 MLD pipeline for conveying the treated effluent to deep sea.</td></tr>
<tr><td>11.</td><td>For Dilute Stream (5031.54 KLD), effluent generated from cooling (428 KLD), boiler blow down (361 KLD), washing(135 KLD), from process (3542.54 KLD) and RO system 2 (565 KLD) shall be treated in existing ETP-2, ETP-4, ETP-5 and proposed ETP-7 and l 160 KLD treated effluent from ETP-2 shall be reused in RO system-'l and 20 KLD to coal dust suppression and remaining 3851.54 KLD treated effluent shall be disposed through after treatment to deep sea through own 5 MLD pipeline.</td><td>The existing treated effluent is being discharged into deep sea which is within the stipulated norms.</td></tr>
</table>

<table>
<tr><th>Sr. No.</th><th>EC Condition</th><th>Compliance Status</th></tr>
<tr><td></td><td></td><td><table><tr><th>Month</th><th>Wastewater Discharge quantity (KL/Month)</th></tr><tr><td>October-2024</td><td>81342</td></tr><tr><td>November-2024</td><td>76653</td></tr><tr><td>December-2024</td><td>78064</td></tr><tr><td>January-2025</td><td>77400</td></tr><tr><td>February-2025</td><td>70729</td></tr><tr><td>March-2025</td><td>77430</td></tr></table>The proposed additional quantity of treated wastewater will also be discharged into deep sea once we start production of the proposed products.</td></tr>
<tr><td>12.</td><td>Overall production capacity after expansion shall not exceed 114765 MT, Month</td><td>We have noted the same and will be complying with the said condition once we start production after obtaining CCA.</td></tr>
<tr><td>13.</td><td>PP shall not carry out necessary remedial measures for solvent management to recover solvent should not be Less than 98%. Further recover solvent shall be completely reused in process within premises.</td><td>Will Comply.
We have not yet manufactured this product. When we manufacture this product, we will follow the in-house distillation.

We will recover spent solvents by in house distillation, when we will manufacture the said product.</td></tr>
<tr><td>14.</td><td>PP shall strictly comply Ozone depleting substance Rule, 2000 & its amendment from time to time.</td><td>Noted & complied

We are filling and complying Timely return against ODS rules.</td></tr>
<tr><td>15.</td><td>PP shall obtain necessary permission from Ozone cell of MOEF & CC, Delhi before commencing for their Expansion plant.</td><td>Complied. The HCFC-22, HCFC-142b, HCFC-225production quota for GFL allows GFL as a group to produce at both our sites as per availability of plant, raw material, efficiency rate etc. As a company, we follow all the ODS compliance requirements and will continue to comply with the same. Overall, the feed to refrigeration use will not exceed from the allowed quota.</td></tr>
<tr><td>16.</td><td>PP shall obtain all necessary permission for their expansion plant before commencing the project.</td><td>Complied</td></tr>
</table>

Sr. No.	EC Condition	Compliance Status
17.	PP shall obtain GIDC permission for drawl of water of 16399.6 KLD & submit copy to this office before Commencing of plant.	We have submitted a letter to GIDC for obtaining the requisite permission and the same will be obtained. Please refer to **Annexure-2A**
18.	PP shall obtain GIDC permission for discharging of treated effluent of 4853 KLD and submit permission to this office.	Not applicable, the treated effluent will be discharged to deep sea through our own 5000 KLD pipeline.
19.	Unit shall install CEMS (continuous Emission Monitoring System in line to CPCB directions to all SPCB vide letter no. B-29016/04/06PCI-1/5401 dated 05/02/2014 for effluent discharge and air emission as per pollutants discharge/emission from respective project and an arrangement shall also be done for reflecting the online monitoring results on the Companies server, which can be assessable by the GPCB/CPCB on real time basis. [For Small Larger Medium (Red Category) & Whichever (Air emission & Effluent discharge) is applicable.	**Complied.** Online monitoring system installed on Stack/Vents and waste water discharge point and same record maintained by Unit. Photos attached: 
20.	(a) The pollution load of R & D products shall remain the same as committed. (b) Project proponent shall not take Continuous/commercial production of the R & D materials. Necessary approvals shall be obtained from the concern Authorities prior to commercial production of R & D materials. (c) Unit shall submit relevant details of R & D products like raw materials, its safety measures to the regulatory authority well before R & D activity. (d) Unit shall submit relevant details of R & D products like different wastes generated (Quantity & Quality) and its management to the regulatory authority within a month of R & D activity.	We have noted the same.
21.	The National Ambient Air Quality Emission Standards issued by the Ministry vide G. S. R. No. 826 (E) dated 16th November,2009 shall be complied with.	**Complied.** Unit is being monitored Ambient Air quality by NABL/ MoEF&CC approved laboratory. Analysis report attached as per **Annexure:3** For the proposed products we will carry out the ambient air monitoring once we start the production.

Sr. No.	EC Condition	Compliance Status
22.	National Emission Standards for Organic Chemicals Manufacturing industry issued by the Ministry vide G. S. R. 608(E) Dated 21/07/2010 and amended from time to time shall be followed.	**Complied.** Unit is being monitored Ambient Air quality by NABL/ MoEF&CC approved laboratory. Analysis report attached as per **Annexure:3** For the proposed products we will carry out the ambient air monitoring once we start the production.
23.	Unit shall have to adhere to the prevailing area specific policies of GPCB with respect to the discharge of pollutants and Shall carry out the project development in accordance & consistence with the same.	Noted and complying.
24.	All measures shall be taken to avoid soil and ground water contamination within premises.	Noted and complied.
25.	Safety & Health:	
a.	PP shall obtain PESO permission for the storage and handling of hazardous chemicals. (lf applicable).	Complied. Please refer to **Annexure-4.**
b.	PP shall provide Occupational Health Centre (OHC) as per the provisions under the Gujarat Factories Rule 68	Complied. First Aid Box readily available in adequate quantity at all the times and all Location. We have well equipped Occupational Health Centre with 02 Nos. ICU Ambulance.
c.	PP shall obtain fire safety certificate / Fire No-Objection certificate (NOC) from the concern authority as prevailing Rules / Gujarat Fire Prevention and Life Safety Measures Act, 20'16.	Fire NOC is not applicable. We have all the requisite permissions from DISH and PESO. Please refer to **Annexure-4**.
d.	Unit shall adopt functional operations/process automation system including emergency response to eliminate risk Associated with the hazardous processes.	Complied
e.	PP shall carry out mock drill within the premises as per the prevailing guidelines of safety and display proper Evacuation plan in the manufacturing area in case of any emergency or accident.	We are carrying out mock drill.
f.	PP shall install adequate fire hydrant system with foam trolley attachment within premises and separate storage of water for the same shall be ensured by PP.	We have installed **adequate fire hydrant system with foam trolley attachment within premises and separate storage of water.**

<table>
<tr><th>Sr. No.</th><th>EC Condition</th><th>Compliance Status</th></tr>
<tr><td>g.</td><td>PP shall take all the necessary steps for control of storage hazards within premises ensuring incompatibility of storage raw material and ensure the storage keeping safe distance as per the prevailing guidelines of the concerned authority.</td><td>Complied</td></tr>
<tr><td>h.</td><td>PP shall take all the necessary steps for human safety within premises to ensure that no any harm is caused to any worker/employee or labor within premises.</td><td>Complied</td></tr>
<tr><td>i.</td><td>Flame proof electrical fittings shall be provided in the plant premises, wherever applicable</td><td>Complied</td></tr>
<tr><td>j.</td><td>Unit shall never store drum/barrels/carboys of incompatible material/chemical together.</td><td>Complied</td></tr>
<tr><td>k.</td><td>Unit shall provide effective isolation for Process area and storage of hazardous chemicals.</td><td>Complied</td></tr>
<tr><td>l.</td><td>The project management shall prepare a detailed disaster Management Plan (DMP) for the project as per the Guidelines from Directorate of industrial Safety and Health.</td><td>Complied</td></tr>
<tr><td>m.</td><td>Unit shall obtain all required permissions from the Narcotics Control Bureau for manufacturing, storage and handling of Acetic Anhydride & any such chemicals.</td><td>Not applicable as we do not use any such raw materials.</td></tr>
<tr><td>n.</td><td>Provide double earthling to solvent storage tanks: ('l) Unit shall provide effective fire hydrants, water monitors & foam application system at solvent storage tank farm area. (2) Unit shall provide adequate safety system such as water sprinklers, water curtains, foam pouring system etc. to restrict cascade fire emergency in solvent tank farm.</td><td>Complied</td></tr>
<tr><td>o.</td><td>Unit shall provide water sprinkler to the ammonia storage cylinder.</td><td>Complied</td></tr>
<tr><td>p.</td><td>Unit shall provide chlorine leakage control emergency kit and FRP hood with scrubber system for chlorine safety</td><td>Complied</td></tr>
<tr><td>q.</td><td>Unit shall provide safety valve and rapture disc, as well as auto dump or auto quench/, suppress system for Exothermic reaction vessel safety.</td><td>Complied</td></tr>
<tr><td>A.2</td><td>Water:</td><td></td></tr>
<tr><td>26</td><td>Total water requirement for the project shall not exceed 18068.6 KLD. Unit shall reuse 1669 KLD of treated effluent within Premises. Hence, fresh water requirement shall not exceed 16399.6 KLD and it shall be met through GIDC water supply only. Prior permission from concerned authority shall be obtained for procurement of water.</td><td>Complied for existing scenario.
<table>
<tr><th>Month</th><th>Water consumption (In Kl/Month)</th><th>Wastewater generation Industrial w/w + domestic(w/w) (Kl/Month)</th></tr>
<tr><td>October-2024</td><td>379292</td><td>132254</td></tr>
<tr><td>November-2024</td><td>363785</td><td>123159</td></tr>
<tr><td>December-2024</td><td>334537</td><td>128546</td></tr>
<tr><td>January-2025</td><td>328043</td><td>124321</td></tr>
<tr><td>February-2025</td><td>314057</td><td>112459</td></tr>
<tr><td>March-2025</td><td>360018</td><td>119988</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>Sr. No.</th><th>EC Condition</th><th>Compliance Status</th></tr>
<tr><td></td><td></td><td>The water consumption will be within the prescribed quantity with respect to the proposed products.</td></tr>
<tr><td>27</td><td>The industrial effluent generation from the project shall not exceed 6033.54 KLD.</td><td>The effluent generation for the existing scenario is being complied with.

<table><tr><th colspan="2">Industrial Wastewater Generation</th></tr><tr><th>Month</th><th>Industrial Wastewater Generation (KL/Month)</th></tr><tr><td>October-2024</td><td>130804</td></tr><tr><td>November-2024</td><td>121709</td></tr><tr><td>December-2024</td><td>127096</td></tr><tr><td>January-2025</td><td>122871</td></tr><tr><td>February-2025</td><td>111009</td></tr><tr><td>March-2025</td><td>118538</td></tr></table>
The wastewater generation will be within the prescribed norms with respect to the proposed products.</td></tr>
<tr><td>28</td><td>Management of industrial effluent shall be as under:

<u>Concentrated Stream (1002 KLD)</u>
1002 KLD high COD effluent generated from process shall be treated in ETP-I, ETP-3 and ETP-6 and treated effluent Shall be discharged into deep sea through own 5 MLD pipeline.

<u>Dilute Stream (5031.54 KLD):</u>
5031.54 KLD Low COD effluent generated from cooling (428 KLD), boiler blow down (361 KLD), washing (135 KLD), from process (3542.54 KLD) and RO system 2 (565 KLD) shall be treated in existing ETP-2, ETP-4, ETP-S and proposed ETP-7 and 1160 KLD treated effluent from ETP-2 shall be reused in RO system-1 and 20 KLD to coal dust suppression and remaining 3851.54 KLD treated effluent shall be disposed through after treatment to deep sea Through own 5 MLD pipeline.</td><td>Complied for the existing scenario

Effluent Generation

<table><tr><th colspan="2">Industrial Wastewater Generation</th></tr><tr><th>Month</th><th>Industrial Wastewater Generation (KL/Month)</th></tr><tr><td>October-2024</td><td>130804</td></tr><tr><td>November-2024</td><td>121709</td></tr><tr><td>December-2024</td><td>127096</td></tr><tr><td>January-2025</td><td>122871</td></tr><tr><td>February-2025</td><td>111009</td></tr><tr><td>March-2025</td><td>118538</td></tr></table></td></tr>
</table>

82

Sr. No.	EC Condition	Compliance Status
		Effluent Recycled **Month** / **RO Permeate (KL/Month)** / **Coal Dust Suppression (KL/Month)** / **Others (KL/Month)** October-2024: 49462 / 550 / 48912 November-2024: 45056 / 555 / 44501 December-2024: 49032 / 557 / 48475 January-2025: 45471 / 549 / 44922 February-2025: 40280 / 565 / 39715 March-2025: 41108 / 580 / 40528 **Effluent Discharged** **Month** / **Wastewater Discharge quantity (KL/Month)** October-2024: 81342 November-2024: 76653 December-2024: 78064 January-2025: 77400 February-2025: 70729 March-2025: 77430 The additional wastewater will be treated and discharged to deep sea. The quantity will be within the prescribed limit.

<table>
<tr><th>Sr. No.</th><th>EC Condition</th><th>Compliance Status</th></tr>
<tr><td>29</td><td>Domestic wastewater generation shall not exceed 49 Kl/day for proposed project and it shall be treated in STP. lt shall not be disposed off into soak pit. Treated sewage shall be utilized for gardening and plantation purpose within premises after Achieving on-land discharge norms prescribed by the GPCB.</td><td>Unit has sewage waste water treatment plant for treatment of sewage water.
  </td></tr>
<tr><td>30</td><td>During monsoon season when treated sewage may not be required for the plantation / Gardening / Green belt purpose, it shall be stored within premises. There shall be no discharge of waste water outside the premises in any case.</td><td>Unit has sufficient capacity for storage of waste water within premises during rainy season So, it will not discharge of waste water outside the premises in any case.</td></tr>
<tr><td>31</td><td>Unit shall provide buffer water storage tank of adequate capacity for storage of treated waste water during rainy days.</td><td>Unit has sufficient water storage tank to store waste water during rainy season.</td></tr>
<tr><td>32</td><td>Unit shall provide STP and ETP with adequate capacity.</td><td>Complied</td></tr>
<tr><td>33</td><td>The unit shall provide metering facility at the inlet and outlet of ETP and maintain records for the same.</td><td>Complied</td></tr>
<tr><td>34</td><td>Proper logbooks of ETP; reuse/ recycle of treated/ untreated effluent; chemical consumption in effluent treatment: quantity & quality of treated effluent sent to common facilities; power consumption etc. shall be maintained and shall be furnished the GPCB from time to time.</td><td>Complied.
Unit is being maintaining the record and same submitted to GPCB from time to time.

Details attached as per Annexure-5

Details of Power Consumption in ETP as per below table:

<table>
<tr><th colspan="2">Details of Power Consumption in ETP</th></tr>
<tr><th>Month</th><th>Power Consumed</th></tr>
<tr><td>October-2024</td><td>283461</td></tr>
<tr><td>November-2024</td><td>269122</td></tr>
<tr><td>December-2024</td><td>238697</td></tr>
<tr><td>January-2025</td><td>235283</td></tr>
<tr><td>February-2025</td><td>212260</td></tr>
<tr><td>March-2025</td><td>234016</td></tr>
</table></td></tr>
<tr><td>A.3</td><td>AIR:</td><td></td></tr>
</table>

<table>
<tr><th>Sr. No.</th><th>EC Condition</th><th>Compliance Status</th></tr>
<tr><td>35</td><td>Unit shall not exceed fuel consumption for Boilers, Rotary Kilns, Thermal Oxidizer, Steam Heater Furnaces, AFBC Boiler, Caustic Soda Flaker and D G Sets as mentioned below.
<table>
<tr><th>Sr. No.</th><th>Source of emission</th><th>Stack height(m)</th><th>Type of Fuel</th><th>Quantity of Fuel</th><th>Types of emission i.e., Air Pollutants</th><th>APCM</th></tr>
<tr><td colspan="7">v EXISTING</td></tr>
<tr><td colspan="7"><u>CPP Plant</u></td></tr>
<tr><td>1</td><td>Waste Heat Recovery Boiler- A with GT 13.5 MW</td><td>30</td><td rowspan="3">Natural Gas</td><td>7000 SCM / Day</td><td rowspan="3">SPM SO_2 NO_X</td><td>--</td></tr>
<tr><td>2</td><td>Waste Heat Recovery Boiler- B with GT 13.5 MW</td><td>30</td><td>7000 SCM / Day</td><td>--</td></tr>
<tr><td>3</td><td>Stack attached to Boiler with GT 4.5 MW</td><td>30</td><td>3300 SCM/ Day</td><td>--</td></tr>
<tr><td colspan="7">A&H Plant</td></tr>
<tr><td>4</td><td>Rotary Kiln</td><td>42</td><td rowspan="2">Natural Gas</td><td>8040 SCM / Day</td><td rowspan="3"></td><td>Low Nox Burner</td></tr>
<tr><td>5</td><td>Rotary Kiln</td><td>42</td><td>8040 SCM / Day</td><td>Low Nox Burner</td></tr>
<tr><td>6</td><td>Thermal Oxidizer</td><td>30</td><td>Natural Gas</td><td>180 SCM / Day</td><td>Wet + Alkali Scrubber</td></tr>
</table></td><td>Noted and complied.

Please refer to Annexure-6.

We have not yet installed 150 TPH boiler yet. We will be installing it in future and when we install it we will obtain the CCA and will comply with all the requirements.</td></tr>
</table>

Sr. No.	EC Condition						Compliance Status
	PTFE Plant						
	7	Steam Heater Furnace -1 TFE-1	30	Natural Gas	5520 SCM /day	SPM SO_2 NO_X	Low Nox Burner
	8	Steam Heater Furnace -2 TFE-2	30		5520 SCM /day		Low Nox Burner
	Coal Based Power Plant						
	9	Stack attached Boiler ESP (90 TPH)	71	Coal	1281 .16 MT/ day	SPM SO_2 NO_X	ESP+Dry Scrubbing
	10	AFBC Boiler (90 TPH coal based)	70	Coal			ESP+Dry Scrubbing
	11	D.G.Set – 1010 KVA*	11	Deisel	2500 liters per day		--
	12	D.G.Set – 1010 KVA*	11		2500 liters per day		--
	13	D.G.Set – 1010 KVA*	11		2500 liters per day		--
	14	D.G.Set – 500 KVA*	11		125 0 liters per day		--
	15	D.G.Set – 500 KVA*	11		1250 liters		--

<table>
<tr><th>Sr. No.</th><th>EC Condition</th><th>Compliance Status</th></tr>
<tr><td></td><td>
<table>
<tr><td></td><td></td><td></td><td></td><td>per day</td><td></td><td></td></tr>
<tr><td colspan="7"><u>Chlor-Alkali Plant</u></td></tr>
<tr><td>16</td><td>Caustic Soda Flaker</td><td>30</td><td>Natural Gas</td><td>5400 SCM /day</td><td>NO_X</td><td>-----</td></tr>
<tr><td colspan="7">Proposed Additional</td></tr>
<tr><td>17</td><td>150 TPH Boiler (Stand-By)</td><td>140</td><td>Coal</td><td>--</td><td>SPM
SO_2
NO_X</td><td>ESP+Dry Scrubbing</td></tr>
</table>
</td><td></td></tr>
<tr><td>36</td><td>PP shall use approved fuels only as fuel in Boilers, Rotary Kilns, Thermal Oxidizer, Steam Heater Furnaces, AFBC Boiler, Caustic Soda Flaker and D G Sets.</td><td>Complied.

Please refer to Annexure-7</td></tr>
<tr><td>37</td><td>Unit shall provide adequate APCM with flue gas generation sources to achieve the norms prescribed by GPCB.</td><td>Complied</td></tr>
<tr><td>38</td><td>Unit shall provide adequate APCM with process gas generation sources as mentioned below:
<table>
<tr><th>Sr. No</th><th>Source emission</th><th>Type of emission</th><th>Stack Height (m)</th><th>APCM</th></tr>
<tr><td colspan="5">PTFE PLANT</td></tr>
<tr><td>1</td><td>PTFE Reactor- Nitrogen Purging</td><td>NOx</td><td>20</td><td>--</td></tr>
<tr><td>2</td><td>Absorption Tower (4F MSU) (TFE-2)</td><td>HF</td><td>45</td><td>--</td></tr>
<tr><td>3</td><td>Induced Draft Fan C-752 A/B</td><td>PM</td><td>15</td><td>Cyclone Separator</td></tr>
<tr><td>4</td><td>Induced Draft Fan C-752 A/B</td><td>PM</td><td>15</td><td>Cyclone Separator</td></tr>
<tr><td>5</td><td>PTFE Reactor- Nitrogen Purging</td><td>NOx</td><td>20</td><td>--</td></tr>
<tr><td>6</td><td>Absorption Tower (4F MSU) (TFE-1)</td><td>HF</td><td>40</td><td>--</td></tr>
<tr><td>7</td><td>HCl Waste gas scrubber (CMS)</td><td>HCl</td><td>34</td><td>Ventury Scrubber</td></tr>
<tr><td>8</td><td>HCl Waste Gas Scrubber (CMS-2)</td><td>HCl</td><td>34</td><td>Ventury Scrubber</td></tr>
</table>
</td><td>Complied.

APCM available on all Stacks and vents.</td></tr>
</table>

Sr. No.	EC Condition					Compliance Status
	9	Induced Draft Fan C-752 C	PM	15	Cyclone Separator	
	10	Induced Draft Fan C-752 D	PM	15	Cyclone Separator	
	11	Induced Draft Fan C-752 E	PM	15	Cyclone Separator	
	12	Induced Draft Fan C-752 F	PM	15	Cyclone Separator	
	13	Tail Gas Scrubber-1	SO_2	30	Wet Alkali Scrubber	
			HF			
	14	Back End Scrubber System (For emergency)	PM	15	Ventury Scrubber	
	15	PTFE Nitrogen Purging Reactor	NOx	20	--	
	CHLOR ALKALI PLANT					
	16	Caustic Chlorine Plant +Hypo Unit	Chlorine	21	Ventury Scrubber	
			HCl			
	17	HCl Scrubber System	Chlorine	21	Ventury Scrubber	
			HCl			
	OTHERS					
	18	Dust Collection in Spar Drying System	PM	30	Dust Collectors	
	19	Dust Collection System Above Spar Silo	PM	30	Dust Collectors	
	20	Scrubber System Central	HCl	30	Wet Alkali Scrubber	
			HF			
	21	Tail Gas scrubber	SOx	30	Wet Alkali Scrubber	
			HF			
39	The fugitive emission in the work zone environment shall be monitored. The emission shall conform to the standards prescribed by the concerned authorities from time to					Unit is being monitored fugitive emission in work zone environment and complied the standards prescribed by the concern authorities from time to time.

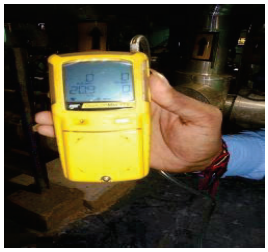
88

Sr. No.	EC Condition	Compliance Status
	time (e.9. Directors of industrial Safety& Health). Following indicative guidelines shall also be followed to reduce the fugitive emission. ➢ internal roads shall be either concreted or asphalted or paved properly to reduce the fugitive emission during vehicular Movement. ➢ Air borne dust shall be controlled with water sprinklers at suitable locations in the plant. ➢ A green belt shall be developed all around the plant boundary and also along the roads to mitigate fugitive & transport dust emission	Work place monitor report attached as per **Annexure: 8** Storage tanks storing HAP chemicals are provided with Breather valve assembly photos attached:   We will also comply with the same for the proposed products as well once we start production.
40	Regular monitoring of Volatile Organic Compounds (VOCS) shall be carried out in the work zone area and ambient air.	**Complied.** Unit is being monitored VOC in the work zone area and ambient air. The same will be done for the proposed products as well once we start their production.
41	For control of fugitive emission, VOCS, following steps shall be followed a. Closed handling and charging system shall be provided for chemicals.	Complied. Work place monitoring is attached as **Annexure-8.**

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Sr. No.	EC Condition	Compliance Status
	b. Reflux condenser shall be provided over Reactors / Vessels. c. Pumps shall be provided with mechanical seals to prevent leakages. d. Air borne dust at all transfers operations/ points shall be controlled either by spraying water or providing enclosures. :	We will also comply with the same for the proposed products as well once we start production.
42	Solvent management shall be carried out as follows: ✓ Measures shall be taken to reduce the process vapors emissions as far as possible. Use of toxic solvents shall be minimum. All venting equipment shall have vapour recovery system. ✓ Reactor shall be connected to adequate chilling system to condensate solvent vapors and reduce solvent losses. ✓ Reactor and solvent handling pump shall have mechanical seals to prevent leakages. ✓ The condensers shall be provided with sufficient HTA and residence time so as to achieve maximum solvent recovery. ✓ Solvent shall be stored in a separate space specified with all safety measures. ✓ Proper earthing shall be provided in all the electrical equipment wherever solvent handling is done. ✓ Solvent storage and handling area shall be flame proof. The solvent storage tanks shall be provided with breather valve to prevent losses.	**Will Comply**. We will provide solvent recovery system, when we will manufacture the said product.
43	Close loop solvent recovery system with adequate condenser system shall be provided to recover solvent vapours in such a manner that recovery shall be maximum and recovered solvent shall be reused in the process within premises	**Will Comply**. We will provide solvent recovery system, when we will manufacture the said product.

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Sr. No.	EC Condition	Compliance Status
44	Leak Detection and Repair (LDAR) program shall be prepared and implemented as per the CPCB guidelines. LDAR Logbooks shall be maintained.	**Complied** A Leak Detection and Repair (LDAR) studies have been carried out in plants through NABL and MoEF & CC accredited 'UNISTAR Environment and research Labs Pvt. Ltd. as per CPCB guidelines. Based on analysis report Hydrocarbons are below Detection limits. Unit has around 27 nos. of LEL detectors based on LEL detection principle and 02 nos. of IR based LEL detectors have been installed in plant areas where there is a likelihood of HC leakages from pumps and other equipment. We had organized training on LDAR for respective employees from external agency and 17 employees attended the training. Photographs attached:   We will also be complying with the same for the proposed products when we start production.
45	Regular monitoring of ground level concentration of PM10, PM2.5, SO2, NOx, HCl, Chlorine, HF and VOCs shall be carried out in the impact zone and its records shall be maintained. Ambient air quality levels shall not exceed the standards stipulated by the GPCB. lf at any stage these levels are found to exceed the prescribed limits, necessary additional control measures shall be taken immediately. The location of the stations and frequency of monitoring shall be decided in consultation with the GPCB.	**Complied.** Unit is being monitored Ambient Air quality by NABL/ MoEF&CC approved laboratory. Please refer to **Annexure-3**. We will also be complying with the same for the proposed products when we start production.
A.4	**SOLID /HAZARDOUS WASTE:**	
46	All the hazardous/ solid waste management shall be taken care as mentioned below.	Unit is being disposed hazardous waste through GPCB approved TSDF site.

Sr. No.	EC Condition	Compliance Status

Sr. No	Type of waste	Specific Source of generation (Name of the Activity, Product etc.)	Category and Schedule as per HW Rules.	Existing Quantity as per CC&A (MT/Annum)	Proposed Extra (MT/Annum)	Total (MT/ Annum)	Disposal Method
1	Used Oil (KL/Year)	Machineries	5.1	85.4	200	285.4	Collection, Storage, Transportation and Disposal by Reuse in plant & machinery as lubricant or sell it to authorized re-refiners / recycler.
2	Empty Barrels/ Discarded Carboys / Drums /Cylinders	Raw Material and product	33.1	25	18	43	Collection, Storage, Decontamination and reuse in house or send it to authorized recycler/ Send it directly to SPCB approved common decontamination facility /send it back to supplier.
3	Spent Resins from DM Plant	Water treatment	35.2	25	10	35	Collection, Collection, Storage Transportation and disposal at SPCB approved

Details of Hazardous waste disposal manifest record is maintained.

We will also be complying with the same for the proposed products when we start production.

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Sr. No.	EC Condition								Compliance Status
								Common TSDF/Incineration/Coprocessing facility/Actual end user.	
	4	ETP Sludge	ETP	35.3	4562	1800	6362	Collection, Storage Transportation and disposal at SPCB approved Common TSDF/Incineration/Coprocessing facility/Actual end user.	
	5	Sludge from wet scrubber	APCM	16.2	2	1	3	Collection, Storage Transportation and disposal at SPCB approved Common TSDF/Incineration/Coprocessing facility/Actual end user.	
	6	Spent Catalyst	Manufacturing process	17.2	28.72	1305.23	1334	Collection, Storage Transportation and disposal at SPCB approved Common TSDF/Incineration/Coprocessing facility/Actual end user.	

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Sr. No.	EC Condition								Compliance Status
	7	Process Waste/ Dist. Residue	Manufacturing process	36.1	2369	3136	5505	Collection, storage, transportation and disposal by sending to authorized actual user having Rule-9 permission for recycling under Schedule-IV of the HWM Rules and with a valid CCA and appropriate MoU/ by sending for co processing to a cement industry or to a CHWIF.	
	8	PTFE Residue	Manufacturing process	1.4	170	129	299	Collection, Storage Transportation and disposal at SPCB approved Common TSDF/Incineration/Coprocessing facility/Actual end user.	
	9	Distillation Residue	Manufacturing process	20.3	2.4	0	2.4	Collection, Storage Transportation and disposal at SPCB approved Common TSDF/Incineration/Coprocessing facility/Actual end user.	
	10	Recovered Solvent	Manufacturing process	--	0	22834.1	22834.1	Collection, storage and reused in manufacturing	

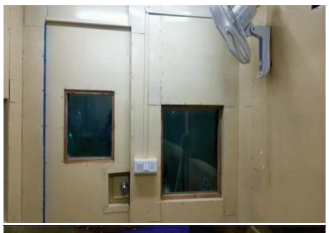
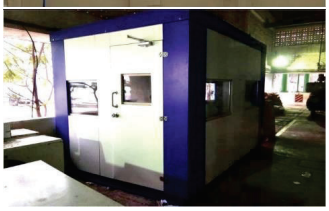
Sr. No.	EC Condition	Compliance Status
	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>process within the premises.</td></tr><tr><td>11</td><td>Bleed Liquor</td><td>APCM</td><td>--</td><td>0</td><td>98483.44 KL/Year</td><td>98483 .44 KL/Y ear</td><td>Collection, storage and sent to ETP for treatment.</td></tr></table>	
47	Authorized end-users shall have permissions from the concerned authorities under the Rule 9 of the Hazardous and Other Waste (Management and Transboundary Movement) Rules 2016.	We have noted it and will make sure that actual end users have valid Rule 9 or Rule 9 application proof.
48	Unit shall explore the possibilities for environment friendly methods like co-processing of hazardous waste for disposal of incinerable & land fill able wastes before sending to CHWIF & TSDF sites respectively.	We have noted the same.
49	The project proponent has to obtain membership of TSDF site & CHWF before obtaining CTO of GPCB.	Complied. Please refer to **Annexure-9.**
50	STP sludge shall be collected and used as manure in gardening activity or send to TSDF site for land filling.	Complied.
51	Management of fly ash shall be as per the Fly ash Notification 2009 & its amendment time to time and it shall be ensured that there is 100% utilization of fly ash to be generated from the unit.	Noted. Unit will use eco-friendly building materials including fly ash bricks. Fly ash paver blocks, Ready Mix Concrete [RMC] and lead-free paints in the project.
52	The unit shall submit the list of authorized end users of hazardous wastes along with MoU signed with them at least two months in advance prior to the commencement of production. in the absence of potential buyers of these items, the unit shall restrict the production of the respective items.	Complied. MoU signed is attached as **Annexure 9 – A.**
A5	**OTHER:**	
53	The project proponent shall carry out the activities of amount of Rs.121 Lakhs (Construction of water reservoir in nearby villages of Dahej, Ambetha, Lakhigam and Luvara village, Provision of roof top solar panel system in Primary Health Cenke, Dahej village Pdmary Health Centre, Lakhigam village, Provision of rooftop solar panel system in Primary School, Dahej Primary School, Lakhigam, Greenbelt Development in Ambetha village and Greenbelt Development in Dahej village) proposed under CER and it shall be part of the Environment Management Plan (EMP) as per the MoEF & CC'S OM no. F. No. 22-6512017-lA.lll dated 30.09.2020. This shall be monitored and the monitoring report shall be submitted to the regional office of MoEF & CC as a part of half-yearly compliance report and to the District Collector. The monitoring report shall be posted on the website of the project proponent.	We are in process of complying the same.
54	As proposed, at least Rs. 108.7500 lakhs shall be allocated for the conservation plan Schedule- l species. (MoEF & CC) (ln case of Sch-l species).	We have submitted the conservation plan and will be spending the said fund once them plan gets approved.

Sr. No.	EC Condition	Compliance Status
55	All the recommendations, mitigation measures, environmental protection measures and safeguards proposed in the EIA report of the project prepared by M/s. Anand Environmental Consultants Pvt. Ltd. and submitted by the project proponent and commitments made during presentation before SEAC and proposed in the EIA report shall be strictly adhered to in Letter and spirit.	Complied.
B. GENERAL CONDITIONS		
B1. Construction phase		
56	Water demand during construction shall be reduced by use of curing agents, super plasticizers and other best constructions.	Complied.
57	Project Proponent shall ensure that surrounding environment shall not be affected due to construction activity construction materials shall be covered during transportation and regular water sprinkling shall be done in vulnerable areas for controlling fugitive emission	Complied.
58	All required sanitary and hygienic measures shall be provided before starting the construction activities and to be Maintained throughout the construction phase.	Complied.
59	First Aid Box shall be made readily available in adequate quantity at all the times.	Complied.
60	The project proponent shall strictly comply with the Building and other Construction Workers' (Regulation of Employment & Conditions of Service) Act '1996 and Gujarat rules made there under and their subsequent amendments. Local bye-laws of Concern authority shall be complied in letter and spirit.	Complied.
61	Ambient noise levels shall conform to residential standards both during day and night. Incremental pollution load on the Ambient air and noise quality shall be closely monitored during construction phase.	Complied.
62	Use of Diesel Generator (DG) sets during construction phase shall be strictly equipped with acoustic enclosure and shall conform to the EPA Rules for air and noise emission standards.	Complied.
63	Safe disposal of waste water and municipal solid wastes generated during the construction phase shall be ensured.	Complied.
64	All topsoil excavated during construction activity shall be used in horticultural / landscape development within the project site.	Complied.
65	Excavated earth to be generated during the construction phase shall be utilized within the premises to the maximum extent possible and balance quantity of excavated earth shall be disposed off with the approval of the competent authority After taking the necessary precautions for general safety and health aspects. Disposal of the excavated earth during Construction phase shall not create adverse effect on neighboring communities.	Complied.

Sr. No.	EC Condition	Compliance Status
66	Project proponent shall ensure use of eco-friendly building materials including fly ash bricks, fly ash paver blocks, Ready Mix Concrete [RMC] and lead free paints in the project.	Complied.
67	Fly ash shall be used in construction wherever applicable as per provisions of Fly Ash Notification under the E.P. Act, 1986 and its subsequent amendments from time to time.	Complied.
68	"Wind – breaker of appropriate height i.e. 1/3rd of the building height and maximum up to '10 meters shall be provided. individual building within the project site shall also be provided with barricades	Complied.
69	No uncovered vehicles carrying construction material and waste shall be permitted."	Complied.
70	No loose soil or sand or construction & demolition waste or any other construction material that cause dust shall be left uncovered. Uniform piling and proper storage of sand to avoid fugitive emissions shall be ensured."	Complied.
71	Roads leading to or at construction site must be paved and blacktopped (i.e. - metallic roads).	Complied.
72	No excavation of soil shall be carried out without adequate dust mitigation measures in place.	Complied.
73	Dust mitigation measure shall be displayed prominently at the construction site for easy public viewing.	Complied.
74	Grinding and cutting of building materials in open area shall be prohibited.	Complied.
75	Construction material and waste should be stored only within earmarked area and road side storage of construction Material and waste shall be prohibited.	Complied.
76	Construction and demolition waste processing and disposal site shall be identified and required dust mitigation measures be notified at the site. (if applicable).	Complied.
B2	**OPEATION PHASE**	
B 2.1 Water		
77	The water meter shall be installed and records of daily and monthly water consumption shall be maintained.	**Complied for existing scenario** Details attached month wise minimum and maximum consumption of total water during compliance period.

Water consumption limit: 14971.5 KL/Day		
Month	Water consumption	
	KL/Month	KL/Day
October-2024	379292	12235.23
November-2024	363785	12126.17
December-2024	334537	10791.52
January-2025	328043	10582.03
February-2025	314057	11216.32
March-2025	360018	11613.48

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Sr. No.	EC Condition	Compliance Status
		For the proposed products we will be complying with the condition once we start production.
78	All efforts shall be made to optimize water consumption by exploring Best Available Technology (BAT). The unit shall Continuously strive to reduce, recycle and reuse the treated effluent.	Complied.
B.2 .2	**AIR**	
79	In case of use of spray dryer, the unit shall provide the adequate & efficient APCMS with spray dryer so that there should not be any adverse impact on human health & environment. Unit shall carry out third party monitoring of the proposed Spray dryer & it's APCM through the credible institutes and study report for impacts on Environment and Human Health shall be submitted to GPCB every year along with half yearly compliance report.	Complied. Please refer to **Annexure-6.**
80	Acoustic enclosure shall be provided to the DG sets (lf applicable) to mitigate the noise pollution and shall conform to the EPA Rules for air and noise emission standards.	**Complied.** Copies of Noise level monitoring test reports by NABL/ MoEF&CC approved laboratory. Acoustic enclosure photos attached:  
81	Stack /vents (Whichever is applicable) of adequate height shall be provided as per the prevailing norms for flue gas emission/Process gas emission.	**Complied.**

98

Sr. No.	EC Condition	Compliance Status
		Unit has adequate stacks/vents height which are mentioned in CCA no: AWH-129478 Dtd. 07/11/2023 having validity upto 15/02/2027. For the proposed additional production there will be no change in the scenario.
82	Flue gas emission & Process gas emission (lf any) shall conform to the standards prescribed by the GPCB/CPCB/ MoEF & CC. At no time, emission level should go beyond the stipulated standards.	**Complied** Online continuous monitoring system installed on flue and process gas emission stacks/Vents.
83	All the reactors /vessels used in the manufacturing process shall be closed to reduce the fugitive emission.	**Complied.** Unit has closed process to reduce fugitive emission.
B.2 .3	HAZARDUS /SOLID WASTE :	
84	The company shall strictly comply with the rules and regulations with regards to handling and disposal of Hazardous waste in accordance with the Hazardous and Other Wastes (Management and Transboundary Movement) Rules 2016, as be amended from time to time. Authorization of the GPCB shall be obtained for collection / treatment / storage / disposal hazardous wastes.	**Complied.** 2. Unit has authorization for collection, storage and disposal of hazardous waste under the Hazardous Waste (Management, Handling and Trans- Boundary Movement) Rules, 2016 valid up to 15/02/2027. 3. Following measures are taken by site for firefighting in case of emergency: - Trained fire fighter available at site 24 X 7. - Fire Hydrant system. - Spray System - Full-fledged Emergency Control Centre and 03 nos. of Fire tenders. - Fire water storage tank of 60000 m3. - Firefighting foam available at site. 3. Site has valid membership of TSDF operated by BEIL Ltd, Dahej Recycling Solutions Pvt. Ltd. (RSPL) for disposal of hazardous waste.

99

Sr. No.	EC Condition	Compliance Status
85	Hazardous wastes shall be dried, packed and stored in separate designated hazardous waste storage facility bottom and leachate collection facility, before its disposal.	**Complied.** Unit has separate designated hazardous waste storage facility with pucca bottom. 

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Sr. No.	EC Condition	Compliance Status
86	The unit shall obtain necessary permission from the nearby TSDF site and CHWF. (Whichever is applicable)	**Complied** Unit has membership of M/s. BEIL, M/s. BANAS WASTE MANAGEMENT, M/s. SEPL. Membership photos attached:   We have also obtained additional permission for the proposed products as well. Please refer to Annexure-9.
87	The unit shall obtain necessary permission from the nearby TSDF site and CHWF. (Whichever is applicable) Vehicle Act, 1988, and rules made there under.	**Complied.** Hazardous waste is disposed through online GPCB XGN Manifest system having VLTS (Vehicle Location Tracking System).

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<table>
<tr><th>Sr. No.</th><th>EC Condition</th><th>Compliance Status</th></tr>
<tr><td>88</td><td>The design of the Trucks/Tankers shall be such that there is no spillage during transportation</td><td>Unit has checklist system to avoid spillage during the transportation.</td></tr>
<tr><td>89</td><td>All possible efforts shall be made for Co-Processing of the Hazardous waste prior to disposal into TSDF/CHWIF.</td><td>For existing scenario, Unit has a pre plan schedule to disposal of co- processing of hazardous waste.

After the proposed expansion also the said condition will be complied with once production is started.</td></tr>
<tr><td>90</td><td>Management of fly ash (if any) shall be as per the Fly ash Notification 2009 & its amendment lime to time and it shall be Ensured that there is 100% utilization of fly ash to be generated from the unit.</td><td>Unit is sending fly ash to Brick manufacturing industries as per fly ash notification 2009. Fly ash disposal details attached

<table><tr><th colspan="2">Fly Ash sent Brick Manufacturing industries</th></tr><tr><th colspan="2">October-2024 To March-2025 in KG</th></tr><tr><td>October-2024</td><td>3174210</td></tr><tr><td>November-2024</td><td>2683460</td></tr><tr><td>December-2024</td><td>2550920</td></tr><tr><td>January-2025</td><td>2458000</td></tr><tr><td>February-2025</td><td>2378330</td></tr><tr><td>March-2025</td><td>2601030</td></tr></table>
After the proposed expansion also the said condition will be complied with once production is started.</td></tr>
<tr><td>B.2.4</td><td colspan="2">SAFETY</td></tr>
<tr><td>91</td><td>The occupier/manager shall strictly comply the provisions under the Factories Act 1948 and the Gujarat Factories Rules 1963.</td><td>Complied.

All the compliance under the factories act 1948 Gujarat Factories Rule 1963.

Details of compliance reports attached as per Annexure: 10.</td></tr>
<tr><td>92</td><td>The project authorities shall strictly Comply with the provisions made in Manufacture, Storage and import of Hazardous Chemicals Rules (MSIHC) 1989, as amended time to time and the Public Liability insurance Act for handling of hazardous Chemicals etc. Necessary approvals from the Chief Controller of Explosives and concerned Govt. Authorities shall be Obtained before commissioning of the project. Requisite On-site and Off-site Disaster Management Plans have to be Prepared and implemented.</td><td>Complied.</td></tr>
<tr><td>93</td><td>Main entry and exit shall be separate and clearly marked in the facility.</td><td>Unit has Main Entry and exit separate and clearly marked.</td></tr>
<tr><td>94</td><td>Sufficient peripheral open passage shall be kept in the margin area for free movement of fire tender/ emergency vehicle around the premises.</td><td>Unit has Sufficient peripheral open passage for free movement of fire tender emergency vehicle around the premises.</td></tr>
</table>

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Sr. No.	EC Condition	Compliance Status
95	Storage of flammable chemicals shall be sufficiently away from the production area.	Unit has separate storage area and it is away from the production area.
96	Sufficient number of fire extinguishers shall be provided near the plant and storage area.	Unit has provided Sufficient numbers of fire extinguishers to the plant and storage area.
97	All necessary precautionary measures shall be taken to avoid any kind of accident during storage and handling of toxic / Hazardous chemicals.	Unit has standard operating procedure to avoid any kind of accident during storage and handling of toxic / Hazardous chemicals.
98	All the toxic/hazardous chemicals shall be stored in optimum quantity and all necessary permissions in this regard shall be Obtained before commencing the expansion activities.	**Complied.** Copies of all Permission letters obtained from statutory Authorities attached as Annexure-4.
99	The project management shall ensure to comply with all the environment protection measures, risk mitigation measures and safeguards mentioned in the Risk Assessment report.	**Complied**
100	Only flame proof electrical fittings shall be provided in the plant premises.	Complied
101	Storage of hazardous chemicals shall be minimized and it shall be in multiple small capacity tanks / containers instead of one single large capacity tank / containers.	Complied
102	All the storage tanks shall be fitted with appropriate controls to avoid any leakages. Bund/dyke walls shall be provided for storage tanks for Hazardous Chemicals.	Complied
103	Handling and charging of the chemicals shall be done in closed manner by pumping or by vacuum transfer so that minimal Human exposure occurs.	**Complied.** We have closed loop system. So, handling and charging of the chemicals has been done in closed manner by pumping or by vacuum transfer so that a minimal human exposure occurs.
104	Tie up shall be done with nearby health care unit / doctor for seeking immediate medical attention in the case of emergency.	**Complied.** Unit has tie-up with Healing touch hospital, Bharuch, Amax Hospital-Dahej, Orthopedic Hospital Bharuch, Baroda Heart Multi Specialty Hospital, Bharuch, Sunshine Global Hospital - Bharuch, Sterling Hospital, Vadodara. Please refer to **Annexure-11.**
105	Personal Protective Equipment (PPEs) shall be provided to workers and its usage shall be ensured and supervised.	**Unit is being complied.**
106	First Aid Box and required Antidotes for the chemicals used in the unit shall be made readily available in adequate quantity.	Yes, Unit has readily available in adequate quantity.
107	Training shall be imparted to all the workers on safety and health aspects of chemicals handling.	**Complied.** Training is being provided to all Company and Contractual employees on Chemical handling procedure, we have also constituted Chemical handling committee.

Sr. No.	EC Condition	Compliance Status
108	Occupational health surveillance of the workers shall be done and its records shall be maintained. Pre-employment and periodical medical examination for all the workers shall be undertaken as per the Factories Act & Rules.	Pre- employment and periodical medical examination for all the workers records have been maintained as per the factories act and rules. Please refer to Annexure-11.
109	Transportation of hazardous chemicals shall be done as per the provisions of the Motor Vehicle Act & Rules.	**Unit is being complied.**
110	The company shall implement all preventive and mitigation measures suggested in the Risk Assessment Report.	**Noted.** No any project activities done during the compliance period. We are doing Hazard identification and risk assessment of all activities and also doing Job specified risk assessment.
111	Necessary permissions from various statutory authorities like PESO, Factory inspectorates and others shall be obtained prior to commissioning of the project.	Complied Please refer to Annexure-4.
B.2.5 NOISE		
112	The overall noise level in and around the plant area shall be kept well within the standards by providing noise control measures including engineering controls like acoustic insulation hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise level shall confirm to the standards prescribed under The Environment (Protection) Act, '1986 & Rules.	**Complied.** The overall noise levels in and around the plant area is kept well within the standards by providing noise control measures including acoustic hoods, silencers, enclosures, etc. on all sources of noise generation. The ambient noise levels are under the standards prescribed under Environment Protection act, 1986 Rules, 1989 viz. 75 dBA, (day time) & 70 dBA (night time). Equipment generating high noise are equipped with Acoustic enclosures; regular maintenance, lubrication and vibration pads are assured for such sources. Noise monitoring data by MoEF&CC approved laboratory is attached as Annexure- **The said condition will also be complied with after the proposed expansion when the production starts.**
B.2.6 CLEANER PRODUCTION AND WASTE MINIMISATION		
113	The unit shall undertake the Cleaner Production Assessment study through a reputed institute / organization and shall Form a CP team in the company. The recommendations thereof along with the compliance shall be furnished to the GPCB.	**Noted & complied.** Unit has done various waste minimization implemented under cleaner production E.g.- 1. ETP: Water recycling through RO 2. PTFE scrap converted into micro powder products

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Sr. No.	EC Condition	Compliance Status
		3. Process water recovery and re-use. We have sewage treatment plant and treated water used in gardening. **The said condition will also be complied with after the proposed expansion when the production starts.**
114	The company shall undertake various waste minimization measures such as: a. Metering and control of quantities of active ingredients to minimize waste. b. Reuse of by-products from the process as raw materials or as raw materials substitutes. c. Use of automated and close filling to minimize spillages. d. Use of close feed system into batch reactors. e. Venting equipment through vapour recovery system. f. t Use of high pressure hoses for cleaning to reduce wastewater generation. g. Recycling of washes to subsequent batches. h. Recycling of steam condensate. i. Sweeping / mopping of floor instead of floor washing to avoid effluent generation. j. Regular preventive maintenance for avoiding leakage, spillage etc.	**Complied.** Company has taken various steps to waste minimization. A. All plant raw materials are monitoring on daily basis with defined specific norms as a DPR B. In Chlor Alkali plant CL2 gas is generated and this chlorine used in CMS plant for production of Sodium hypochlorite. In CMS plant Chloroform generated as a by-product and used in R22 Plant for production of R22. C. Unit has automated meters, Mass flow meters and level switch instruments which has auto cut off set point to minimize spillages. D. Unit has closed feed system in to batch reactors like DPTFE & SPTFE. E. Unit has scrubber system. F. Unit has own drum decontamination facility for decontamination of drums in which we are using high pressure hoses for cleaning drums, so we are reducing waste water generation. Cleaned drums reused in process. G. In DPTFE plant we have ANFD (Agitated Nutsche Filter Dryer) system for water recovery in which we are recycling back process water in Cooling Tower system. H. we have Condensate Policing Unit in which steam condensate has been recovered and reutilized in Boiler feed water make up. we are doing mopping of floor to avoid effluent generation. **The said condition will also be complied with after the proposed expansion when the production starts.**
B.2.7 GREEN BELT AND OTHER PLANTATION.		
115	The unit shall develop green belt within premises as per the CPCB guidelines. However, if the adequate land is not available within the premises, the unit shall take up adequate plantation on road sides and suitable open areas in GIDC estate or any other open areas in consultation with the GIDC / GPCB and submit an action plan of plantation for next three years to the GPCB.	**Complied.** Unit has green belt development with layout plan and of green belt area covered. Greenbelt development layout attached as per **Annexure:1.** Details attached for the plantation for next three years attached as **Annexure: 1.**

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Sr. No.	EC Condition	Compliance Status
116	Drip irrigation / low-volume, low-angle sprinkler system shall be used for the green belt development within the premises.	**Complied.** Unit has installed of Drip irrigations. Photos attached:   

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Sr. No.	EC Condition	Compliance Status
117	The PP shall develop green belt [64012.6 Sq m (12.44 %) inside pant premises + 105725.97 Sq m (20.55%) at GIDC (Outside plant premises) = Total: .169738.S7 Sq. m.) i.e. 33 % of total plot area] as submitted before SEAC. green belt shall be developed with native plant species that are significant and used for the pollution abatement as per guidelines. lt shall be implemented within 3 years of operation phase in consultation with GPCB.	We are complying with the said condition
B.3 Other Condition		
118	The projects covered under category 5(f) shall undergo the safety and environment audit regularly as per the standards laid down by the GPCB and CPCB.	Noted.
119	PP shall carry out the safety audit and Risk Assessment Report as per the prevailing guidelines of safety.	Complied
120	Management of Fly Ash shall be as per the Fly Ash Notification 2009 & its amendment from time to time and it shall be Ensured that there is 100 % utilization of fly ash to be generated from the unit.	Complied
121	EMP should invariably include provisions for environmental Monitoring and measures fur noise pollution control measures.	Noted.
122	In EMP proponent should separately indicate majors of occupational health, fire and safety measures.	Complied
123	Prior EC is granted is subject to the proponent receiving all statutory permission / clearances / certificates and membership of respective agencies / authorities which ever applicable. Proponent shall inform progress from time to time, in six Monthly compliance report to MOEFCC / SEIAA / SEAC/ GPCB failing to which this provisional EC will stand withdrawn.	Complied
124	Wherever waste water or chemical water to be collected by tankers and transported to CETP etc. any diversion and disposal in open drainage (nallah) etc. causing human and environmental damage or loss will make it liable for action under the law.	Noted.
125	All transport movement by tankers etc has to be done with maintenance of gate pass and logbook it should be verified by the inspecting authorities.	Complied
126	Non-hazardous waste data shall be informed to GPCB time to time so as to make an assessment and tie-up with industry for generating sustainable power from the waste.	Complied
127	All chemical pharma industry etc. should ensure predictive and preventive maintenance of factory / boiler and reactive show as to avoid incident of fire and safety hazards.	Complied
128	EMP should include STP and detail cost including maintenance, transportation of waste water to CETP / CMEE etc as well as transportation cost or transit cost.	Complied
129	In LDAR preventive and predictive maintenance plan.	Complied
130	1n LDAR leakage component, source of equipment leak, detention method should be given in table form.	Complied

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Sr. No.	EC Condition	Compliance Status
131	In storage component should be shown separately in terms whether inflammable, toxic, corrosive, reactive etc.	Complied
132	In case of Fly Ash generation its management and disposal should be as per Government of lndia Notification and 1OO % Utilization should be ensured.	Complied
133	Project proponent shall install all environment management systems as per the CPCB/GPCB directives regarding the effluent discharge and air emission in working condition.	Complied
134	Project proponent shall display the copy of Environment Clearance at the site prominently.	Complied
135	Project proponent shall prepare and follow regular and preventive maintenance plan. The copy of same shall be submitted to SEIAA.	Complied
136	Project Proponent will have to display the safety procedure in working area	Complied
137	The project proponent shall obtain all required permissions for safety, health and fire from competent authorities PESO/Fire Authority etc. and intimate SEIAA	Complied
138	Project Proponent will intimate SEIAA/SEAC/GPCB after obtaining the membership of common facilities like CETP / CHWIF / CMEE / Common Spray Dryer as the case may be.	Complied
139	Extra care will be taken by PP to avoid any accidental blast in boiler, reactor or any machinery in the plant.	Complied
140	Environment monitoring, training and disaster management plan should be undertaken and complied at regular intervals.	Complied
141	Integrated Regional Office of MoEF & Cc, Gandhinagar and GPCB will monitor all environment, safety & health per the prevailing rules.	Complied
142	The PP has to maintain the log sheets / registers / manifest / gate pass for discharge through tankers and SCADA system for pipeline discharge for the waste water generation and its disposal data and submit to the GPCB every quarter. GPCB Shall verify the same on regular basis and inform SEIAA and take legal action in the cases of non compliance.	Complied
143	Unit shall comply all the applicable standard conditions prescribed in Office Memorandum (OM) published by MoEF&CC vide no. F. No. 22-3412018-lA.lll dated 09/08/20'18 for Pharmaceutical and Chemical industries mentioned at (Sr. no. XX).	Complied
144	The project proponent shall allocate the separate fund for Corporate Environment Responsibility (CER) in accordance to the MoEFCC'S Office Memorandum No. F.No.22-65/2017-lA.lll dated 01/05/2018 to carry out the activities under CER in	Complied

Sr. No.	EC Condition	Compliance Status
	affected area around the pro]ect. The entire activities proposed under CER shall be monitored and the monitoring report shall be submitted to the regional office of MoEFCC as a part of half-yearly compliance report and to district collector. The monitoring report shall be posted on the website of the project proponent.	
145	Rain water harvesting of surface as well as rooftop runoff shall be undertaken and the same water shall be used for the various activities of the project to conserve fresh water as well as to recharge ground water. Before recharging the surface run off, pre-treatment must be done to remove suspended matter'	Complied
146	The unit shall join and participate financially and technically for any common environmental facility / infrastructure as and when the same is taken up either by the industrial Association or GIDC or GPCB or any such authority created for this Purpose by the Govt. / GIDC.	Complied
147	Application of solar energy shall be incorporated for illumination of common areas, lighting for gardens and street lighting in addition the provision for solar water heating system shall also be provided	Complied
148	The area earmarked as green area shall be used only for plantation and shall not be altered for any other purpose.	Complied
149	All the commitments / undertakings given to the SEAC during the appraisal process for the purpose of environmental Protection and management shall be strictly adhered to.	Complied
150	The project proponent shall also comply with any additional condition that may be imposed by the SEAC or the SEIAA or any other competent authority for the purpose for the environmental protection and management.	Complied
151	In the event of failure of any pollution control system adopted by the unit, the unit shall be safely closed down and shall not be restarted unit the desired efficiency of the control equipment has been achieved.	Complied
152	The project authorities must strictly adhere to the stipulations made by the Gujarat Pollution Control Board (GPCB), State Government and any statutory authority.	Complied
153	During material transfer there shall be no spillages and garland drain shall be constructed to avoid mixing of accidental spillages with domestic wastewater or storm water	Complied
154	Pucca flooring / impervious layer shall be provided in the work areas, chemical storage areas and chemical handling areas to minimize soil contamination.	Complied
155	Leakages from pipes, pumps shall be minimal and if occurs, shall be arrested promptly.	Complied
156	No further expansion or modifications in the plant likely to cause environmental impacts shall be carried out without obtaining prior Environment Clearance from the concerned authority	Complied
157	The above conditions will be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) 4ct,1974, Air (Prevention & Control of Pollution)	Complied

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Sr. No.	EC Condition	Compliance Status
	Act, 1981, the Environment (Protection) Act, '1986, Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008 and the Public Liability insurance Act, 1991 along with their amendments and rules.	
158	The project proponent shall comply all the conditions mentioned in 'The Companies (Corporate Social Responsibility Policy) Rules, 2014' and its amendments from time to time in a letter and spirit.	Complied
159	The project management shall ensure that unit complies with all the environment protection measures, risk mitigation measures and safeguards remanded in the EMP report and Risk Assessment study report as well as proposed by project proponent.	Complied
160	The project authorities shall earmark* adequate funds to implement the conditions stipulated by SEIAA as well as GPCB along with the implementation schedule for all the conditions stipulated herein. The funds so provided shall not be diverted for any other purpose.	Complied
161	The applicant shall inform the public that the project has been accorded environmental clearance by the SEIAA and that the copies of the clearance letter are available with the GPCB and may also be seen al the Website of SEIAA/ SEAC/ GPCB. This shall be advertised within seven days from the date of the clearance letter, in at least two local newspapers That are widely circulated in the region, one of which shall be in the Gujarati language and the other in English. A copy of the same shall be forwaded lo the concerned Regional Office of the Ministry.	Complied
162	hall be mandatory for the project management to submit half-yearly compliance report in respect of the stipulated prior clearance terms and conditions in soft copies to the regulatory authority concerned, on 1st June and 1st of each calendar year.	Complied
163	Concealing Factual data or submission of false/fabricated data and failure to comply with any of the conditions mentioned result in withdrawal of this clearance and attract action under the provisions of Environment (Protection) Act (1986).	Complied
164	The project authorities shall also adhere to the stipulations made by the Gujarat Pollution Control Board.	Complied
165	The SEIAA may revoke or suspend the clearance, if implementation of any of the above conditions is not found Satisfactory.	Complied
166	The company in a time bound manner shall implement these conditions. The SEIAA reserves the right to stipulate Additional conditions, if the same is found necessary.	Complied
167	The project authorities shall inform the GPCB, Regional Office of MoEF and SEIAA about the date of financial closure and final approval of the project by the concerned authorities and the date of start of the project.	Complied
168	This environmental clearance is valid for Ten years from the date of issue	Complied

Sr. No.	EC Condition	Compliance Status
169	Any appeal against this environmental clearance shall lie with the National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.	Complied
170	Submission of any false or misleading information or data which is material to screening or scoping or appraisal or Decision on the application makes this environment clearance cancelled.	Complied
B.4 COMPLIANCE OF ENVIRONMENT CLEARANCE/REPORTING/AOMINISTRATION/APPEAL		
171	Project proponent shall submit Certified Compliance Report of IRO, Gandhinagar for Existing EC obtained Within 10 days	Complied
172	Project proponent shall inform to all the concerned authorities including Municipal Corporation and District Collector and shall also give wide publicity through advertisement in minimum two local newspapers within seven days, about the Environment Clearance order accorded.	Complied
173	Project proponent shall appoint a key person in the organization who shall be responsible for compliance of above condition fully on behalf of the proponent. It will not mean that appointing a key person will exempt the project proponent from the responsibility of compliance. Any change in key person shall immediately be informed to SEIAA and all Concerned authorities.	Complied
174	Designated key person shall submit six monthly compliance report to SEIAA/SEAC, MOEF&CC, GPCB and Nodal Department of the Government.	Complied
175	The Nodal Department or any authority or officer authorized by MOEF&CC/SEIAA can inspect the site of the project and all the facilities, for verification of compliances of environment clearance conditions.	Complied
176	In case of violation reported upon, the project proponent shall be responsible for all the legal actions as per Environment Protection Act, '1986 including SEIAA may cancel, withdraw or keep in abeyance, the Environment Clearance accorded.	Complied
177	Any person including the project proponent affected by this Environment Clearance order may File appeal to Honorable National Green Tribunal West Zone branch, Pune, preferably within a period of thirty days from the date of issue of Environment Clearance as prescribe under section 16 of National Green Tribunal Act 2010.	Complied
178	All complaints and public grievance or representations may be addressed to SEIAA/SEAC in the email addresses (a) msseiaagj@gmail.com& (b) seacgujarat@gmail.com	Complied

For, **M/s. GUJARAT FLUOROCHEMICALS LIMITED**

[AUTHORIZED SIGNATORY]

Gujarat Fluorochemicals Ltd. DAHEJ

Annexure-3

(PDF_CMP)

COMPLIANCE REPORT WITH RESPECT TO CONSOLIDATED CONSENT AND AUTHORIZATION (CC&A)

Name of the Unit	:	M/s., Gujarat Fluorochemicals Limited
Location	:	Plot No.: 12-A, Dahej GIDC Industrial Estate, Ta : Vagra, Dist : Bharuch
Reference	:	Consolidated Consents & Authorization (CC & A) Amendment No-AWH-129478, issued vide letter no. GPCB/BRCH/CCA-1080(23)/ID-15136/744940, dated 07/11/2023 which is valid up to: 15/02/2027.

<table>
<tr><th>Sr. No.</th><th>Condition</th><th>Status of Compliance</th></tr>
<tr><td>–</td><td>Consent Order No. AWH-129478, Date of Issue: 07/11/2023.
Validity of this order shall be up to : 15/02/2027</td><td>Noted.</td></tr>
<tr><td>1</td><td>The List of Proposed products to be manufactured shall be as follows.
<table>
<tr><th rowspan="2">Sr. No.</th><th rowspan="2">Name of Products</th><th colspan="3">Quantity (MT/Month)</th></tr>
<tr><th>Existing</th><th>Proposed</th><th>Total (After change in product mix)</th></tr>
<tr><td>1.</td><td>PolytetraFluoro Ethylene (PTFE)#</td><td>1800</td><td>0</td><td>1800</td></tr>
<tr><td>2.</td><td>Ethyl Tetra Fluoro Ethyl Ether (ETFEE)</td><td>400</td><td>-200</td><td>200</td></tr>
<tr><td>3.</td><td>Carbon Dioxide-Food grade gas</td><td>2267</td><td>-2267</td><td>0</td></tr>
<tr><td>4.</td><td>Carbon Dioxide-Dry Ice</td><td>533</td><td>-533</td><td>0</td></tr>
<tr><td>5.</td><td>Pentafluoroethane (HFC -125)</td><td>417</td><td>233</td><td>650</td></tr>
<tr><td>6.</td><td>Chloroform</td><td>10090</td><td>0</td><td>10090</td></tr>
<tr><td>7.</td><td>Methylene Dichloride (MDC)</td><td>10090</td><td>0</td><td>10090</td></tr>
<tr><td>8.</td><td>Carbon Tetrachloride (CTC)**</td><td>1440</td><td>0</td><td>1440</td></tr>
<tr><td>9.</td><td>Sulphuric Acid (70%- 88%)</td><td>713</td><td>0</td><td>713</td></tr>
<tr><td>10.</td><td>Hydrochloric Acid (31 % +/- 1%)</td><td>37992</td><td>0</td><td>37992</td></tr>
<tr><td>11.</td><td>Caustic Soda (Dry Basis)</td><td>15500</td><td>0</td><td>15500</td></tr>
<tr><td>12.</td><td>Chlorine Dry Basis</td><td>13167</td><td>0</td><td>13167</td></tr>
<tr><td>13.</td><td>Hydrogen</td><td>464</td><td>0</td><td>464</td></tr>
<tr><td>14.</td><td>Hydrochloric Acid (31% ± 1 %)</td><td>357</td><td>0</td><td>357</td></tr>
<tr><td>15.</td><td>Sodium hypochlorite (10% chlorine)</td><td>132</td><td>0</td><td>132</td></tr>
<tr><td>16.</td><td>Calcium Chloride</td><td>4750</td><td>0</td><td>4750</td></tr>
<tr><td>17.</td><td>Dilute HF (20 %)</td><td>1000</td><td>0</td><td>1000</td></tr>
<tr><td>18.</td><td>High Boiler of Chloromethane</td><td>200</td><td>0</td><td>200</td></tr>
<tr><td>19.</td><td>HexaFluoro Propylene (HFP)</td><td>300</td><td>0</td><td>300</td></tr>
<tr><td>20.</td><td>Tetrafluoro Dimethyl Amine (TFE DMA)</td><td>90</td><td>-45</td><td>45</td></tr>
<tr><td>21.</td><td>DichloroFluoromethane (HCFC-21/R-21)</td><td>230</td><td>0</td><td>230</td></tr>
<tr><td>22.</td><td>Dichloropentafluoro Propane (HCFC-225)</td><td>415</td><td>-5</td><td>410</td></tr>
<tr><td>23.</td><td>Methyl Tetra Fluoro Ethyl Ether</td><td>83</td><td>-73</td><td>10</td></tr>
</table>
</td><td>Noted, The quantum of production does not exceed the quantities as mentioned here.</td></tr>
</table>

	(MTFEE)			
24.	Tri fluoromethane	21	0	21
25.	1,1,3Trichlorotetrafluoropropane (HCFC 224ca)	25	0	25
26.	Gypsum	12768	0	12768
27.	Fluoro Elastomers (FKM)*	300	100	400
28.	PerfluoroAlkoxy (PFA)*	200	125	325
29.	Polyvenylidene Fluoride (PVDF)*	250	-100	150
30.	Fluorinated Ethylene Propylene (FEP)*	250	-75	175
31.	Intermediate Vinylidene Fluoride (VDF)	84	0	84
32.	Hydrofluosilicic Acid (20%)	200	0	200
33.	2, 6- Dichloro-4-Trifluoro Methyl Aniline (DCTFMA)	65	0	65
34.	Trifluoro Methyl Aniline (TFMA)	20	-19	1
35.	Iodurate	1	0	1
36.	Tetra Fluoro Beta Sulfone	25	-25	0
37.	Tetra Fluoro Ethyl Ether (Propyl, butyl, TF Propyl)	80	-55	25
38.	Di Chloro Tetra Fluoroethoxy aniline	10	-10	0
39.	I-SAN	20	0	20
40.	Poly Chloro Tri Fluoro Ethylene (PCTFE)	4	0	4
41.	C4 to C34 Surfactant (Non-fluorinated)	10	0	10
42.	R&D Products	10	0	10
43.	Mono Chloro Difluoro Methane (R-22)	1100	0	1100
44.	Proton Exchange Membrane incl Monomer	0	10	10
		117873	**-2939**	**114934**
45.	Gas Based COGEN	54.5 MW	0	54.5 MW
46.	Coal Base COGEN			
47.	Gas Base CCGT	37 MW	0	37 MW
	Total	**91.5 MW**		**91.5 MW**

SPECIFIC CONDITION:		
a)	Unit shall install and implement of Online Continues Monitoring system (OCMS) with at least 95% uptime connected to the servers of the Central Pollution Control Board and state Pollution Control Board to report the quantity and quality of emission and discharges as per the notification.	We are complying with this condition.
b)	Unit shall comply GPCB's office order dated 31/05/21 and MoEF&CC's notification dated 02/03/21	We have taken note of the same.
c)	There shall be no increase in pollution load due to proposed change in product mix.	We have taken note of the same.
d)	There shall not be any change in plant building, equipment's and machineries to manufacture the proposed new products after change in product mix.	We have taken note of the same.
e)	Unit shall not carry out any construction activities and production which attracts provision of Environmental Clearance without obtaining EC from competent authority	We have taken note of the same.

<table>
<tr><td></td><td>under EIA notification dated 14/09/2006 and amended thereafter.</td><td></td></tr>
<tr><td>f)</td><td>There shall be no increase in water consumption, wastewater generation, fuel co9nsumption, flue gas emission and process gas emission.</td><td>We have taken note of the same and is being complying with the same.</td></tr>
<tr><td>g)</td><td>In case of submission of the false or misleading data, this CCA Amendment will be forfeited immediately.</td><td>We have taken note of the same.</td></tr>
<tr><td>h)</td><td>Unit shall comply with Ozone Depleting substance (Regulation and control) Rules 2000 amended from time to time.</td><td>We have taken note of the same.</td></tr>
<tr><td>3.</td><td colspan="2"><u>CONDITIONS UNDER THE WATER ACT</u></td></tr>
<tr><td>3.1</td><td>The condition No. 3.1 for Water Consumption under Water Act of the CCA ender Ne AWH-118244, Issued vide letter no. GPCB/BRCH/CCA-1080(22)/ID-15136/682404, dated 07/02/2022 is amended and shall be read as under.
<table>
<tr><td>Water
(Qty: KL/day)</td><td colspan="3">Water consumption</td></tr>
<tr><td></td><td>Existing</td><td>Proposed</td><td>Total</td></tr>
<tr><td>Domestic</td><td>52.5</td><td>0</td><td>52.5</td></tr>
<tr><td>Industrial</td><td>13193</td><td>-20.6</td><td>13172.4</td></tr>
<tr><td>Gardening</td><td>50</td><td>0</td><td>50</td></tr>
<tr><td>Total</td><td>13295.5</td><td>-20.6</td><td>13274.9</td></tr>
</table></td><td>We are strictly complying the condition.
Our water consumption is within the confines of the quantity specified in the said condition.</td></tr>
<tr><td>3.2</td><td>The condition No. 3.2 for Wastewater Generation under Water Act of the CCA order No AWH-118244, Issued vide letter no. GPCB/BRCH/CCA-1080(22)/ID-15136/682404, dated 07/02/2022 is amended and shall be read as under.
<table>
<tr><td>Water
(Qty: KL/day)</td><td colspan="3">Water consumption</td></tr>
<tr><td></td><td>Existing</td><td>Proposed</td><td>Total</td></tr>
<tr><td>Domestic</td><td>45</td><td>0</td><td>45</td></tr>
<tr><td>Industrial</td><td>4399</td><td>-24.28</td><td>4374.72</td></tr>
<tr><td>Total</td><td>4444</td><td>-24.28</td><td>4419.72</td></tr>
</table></td><td>Our wastewater generation is within the confines of the quantity specified in the said condition.</td></tr>
<tr><td>3.3</td><td>The condition No. 3.3 for disposal of treated wastewater under the Water Act of the CCA orders No: AWH-118244, Issued vide letter no. GPCB/BRCH/CCA-1080(22)/ID-15136/682404, dated 07/02/2022 is amended and shall now be read as under</td><td></td></tr>
<tr><td>--</td><td><u>Mode of disposal of treated effluent:</u>
• 4374.72 KL/Day industrial wastewater shall be treated in ETP consisting (Primary + Secondary + Tertiary Treatment). After treatment, 1600 KLD of RO permeate (RO-1 permeate: 1080 KLD and RO-2 permeate: 420 KLD) shall be used for cooling tower and 20 KLD of treated wastewater shall be discharged through own 5 MLD pipeline in to the deep Sea after confirming norms prescribed in condition no. 3.6 of previous CCA AWH-118244.
• Total 45 KLD domestic sewage shall be treated wastewater shall be used for gardening purpose after confirming norms prescribed in condition no. 3.5 of previous CCA AWH-118244.</td><td>Complied, The treated STP water is utilized for plantation and gardening within premises and for Industrial effluent unit maintaining the ZLD.</td></tr>
<tr><td>4</td><td colspan="2"><u>CONDITIONS UNDER THE AIR ACT</u></td></tr>
</table>

4.1	The c9ondition No. 4.1 for Fuel consumption under Air Act of the CCA order No. AWH-118244 issued vide letter no. GPCB/BRCH/CCA-1080(22)/ID-15136/682404, dated 07/02/2022 is amended as under: **Sr. No. / Name of Fuel / Quantity** **Existing / Proposed / Total** 1. Coal (MT/Day) — 1270.16 / -1.82 / 1268.34 2. Natural Gas (SCM/Day) — 50,000 / 0.0 / 50,000 3. LDO (KL/Day) — 10.0 / 0.0 / 10.0	We are strictly complying the condition.
5	**CONDITIONS UNDER HAZARDOUS & OTHER WASTES (MANAGEMENT & TRANSBOUNDARY MOVEMENT) RULES, 2016**	
5.1	Unit shall comply with provisions of Hazardous & Other Wastes (Management & Transboundary Movement) Rules-2016.	The unit strictly adheres to the Hazardous and Other Waste (Management and Transboundary Movement) Rules, 2016.
5.2	**The condition No. 6.2 under authorization for Hazardous & other wastes of the CCA order No: AWH-118244, issued vide letter no. GPCB/BRCH/CCA-1080(22)/ID-15136/682404, dated 07/02/2022 is amended and shall now read as under.**	Complied, The generation of hazardous waste is not exceeding the given quantity and it is disposed of as per the given condition.

Sr. No.	Type of Waste	HW Schedule-Category	`Quantity MT/ Annum			Facility
			Exi.	Pro.	Total	
1.	Used Oil	5.1	85.4 KL	0	85.4 KL	Collection, Storage, reused, Transportation and send to authorized recyclers/ refiners.
2.	Empty Barrels/ Discarded Carboys/ Drums/ Cylinders	33.1	25 MT	0	25 MT	Collection, Storage, Decontamination / Detoxification, Reuse, Transportation and send to authorized decontamination facility.
3.	Spent resins from DM plant	35.2	25 MT	0	25 MT	Collection, Storage, Transportation and Disposal at approved CHWIF/ TSDF site.

4.	ETP Sludge	35.3	4562 MT	0	4562 MT	Collection, Storage, Transportation and send to common TSDF site.
5.	Sludge from wet scrubber	16.2	2 MT	0	2MT	Collection, Storage, Transportation and send for Co-processing facility to cement industry registered with XGN/ CHWIG/ Common TSDF site.
6	Spent Catalyst	17.2	28.72 MT	-0.01	28.72 MT	Collection, Storage, Transportation and send for Co-processing facility to cement industry registered with XGN/ CHWIF/ Common TSDF site.
7	Process waste/ Dist. Residue	36.1	2369 MT	-10.58	2358 MT	Collection, Storage, Transportation and send to authorized Actual end-user having Rule-9 permission & Valid CCA after making MoU/ send to Co-processing facility to cement industry registered with XGN/ CHWIF site.
8	PTFE Residue	1.4	170 MT	0	170 MT	Collection, Storage, Transportation and send for Co-processing facility to cement industry
9	Distillation Residue	20.3	2.4 MT	0	2.4 MT	

	registered with XGN/ CHWIF/ Common TSDF site.	
6	All other condition of the CCA order No: AWH-118244, issued vide letter no. GPCB/BRCH/CCA-1080(22)/ID-15136/682404, dated 07/02/2022 shall remain unchanged.	We have noted the same.

For,
M/s., Gujarat Fluorochemicals Limited

(Authorized Signatory)

Gujarat Fluorochemicals Ltd. DAHEJ

GUJARAT FLUOROCHEMICALS
VALUE THROUGH GREEN CHEMISTRY

GUJARAT FLUOROCHEMICAL LIMITED
SITE-A, DAHEJ

THIRD PARTY SAFETY AUDIT
(AS PER IS 14489-2018)
JULY, 2023

PREPARED BY

VERSATILE
Empowering the Future

VERSATILE ENGISAFE PRIVATE LIMITED
A-504, SAIDHAM RESIDENCY, NR. ABC CIRCLE, BHOLAV,
BHARUCH, GUJARAT, INDIA
PH: 02642-228151, +91-94263-58787

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DOCUMENT DETAILS

TITLE	Third-Party Safety Audit	**VERSATILE ENGISAFE PVT. LTD.** A-504, Saidham Residency, Nr. ABC Circle, Bholav, Bharuch, Gujarat, India. Ph.: 02642-228151, Mo.:+91-94263-58787 **Email:**info.versatileengisafe@gmail.com
FOR	**GUJARAT FLUOROCHEMICAL LIMITED, SITE-A, DAHEJ** Plot No: 12/A, Industrial Estate Dahej, Tal: Vagra, Dist.: Bharuch, Gujarat	
AUDIT SESSION	Date: 07th & 8th July, 2023	
	Place: **GUJARAT FLUOROCHEMICAL LIMITED, SITE-A, DAHEJ**	

DOC. NO.	**TPSA/MOL/2324/1003**	**AUDITOR**	Mr. Sanjay Masrani Mr. Anil Shah Mr. Sunil Dave
DATE OF ISSUE	13th July 2023	**SITE COORDINATOR**	Mr. Sharad Potghan Mr. Maulik shah Mr. Jikar Malek
REVISION NO.	00		
PREPARED BY	Vishal Patoliya *Process Safety Engineer*	*Signature*	
REVIEWED BY	Dharmesh Sankla *Director-Technical*	*Signature*	
APPROVED BY	Sanjay Masrani *Auditor*	*Signature*	

REV.	DATE	STATUS	DESCRIPTION
00	08th Septembere 2023	Rev.00	No Comments
00	13th July 2023	Rev.00	Issued for confirmation

AUDITOR'S REPORT

Safety Audit of **M/s GUJARAT FLUOROCHEMICAL LIMITED, SITE-A, DAHEJ** is situated at Plot No: 12/A, Industrial Estate Dahej, Tal: Vagra, Dist.: Bharuch, Gujarat was carried out on 07th & 8th July, 2023 by **M/s. VERSATILE ENGISAFE PVT. LTD., Bharuch**. During the period of audit, field visits and technical discussions were held by Mr. Sanjay Masrani, Mr. Anil Shah and Mr. Sunil Dave & also reviewed the documents and discussed with concern representatives of the plant. Safety Audit is carried out as per **BIS 14489-2018**. The auditor has sincerely tried to adhere to the terminology and methodology of **BIS 14489-2018**. The observations and recommendations are based on information supplied to us by the company & plants visits. Auditor acknowledges the management of **M/s. GUJARAT FLUOROCHEMICAL LIMITED, SITE-A, DAHEJ** for their valuable co-operation & help render for the safety audit.

Signature of Auditor

AUDIT CERTIFICATE

We are pleased to certify that this Occupational Safety and Health Audit of **M/s GUJARAT FLUOROCHEMICAL LIMITED, SITE-A, DAHEJ**, Plot No: 12/A, Industrial Estate Dahej, Tal: Vagra, Dist.: Bharuch, Gujarat has been conducted by us in the month of JULY 2023.

Safety Audit is a legal requirement Under Rule 12–C, 68–O and 68-J of the Gujarat Factories Rules, 1963 and Rule 10 of the Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989.

This audit is carried out as per requirements of the above statutes and as per guidelines given in IS 14489: 2018.

We have sincerely tried to adhere to the terminology and methodology of IS 14489:2018 and gone through the maximum details as suggested in Annex B & C thereof.

The observations and recommendations are based on information supplied to us by the company and our plant visits. The detailed observation report is attached herewith.

The Executive Summary is given in the beginning to highlight the significant observations in our audit report. We hope the compliance of audit points suggested in this report will make the company safer and healthier.

The Third-Party Safety Audit is valid for one Year as per MSIHC Rule 1989; hence next Audit will be due in July 2024.

Seal **For, VERSATILE EngiSafe Pvt Ltd.**

Place: Bharuch **Director (Technical)**

1: EXECUTIVE SUMMARY

In order to assess the existence and effectiveness of health and safety system, the management of **M/S GUJARAT FLUOROCHEMICAL LIMITED, SITE-A, DAHEJ**, Plot No: 12/A, Industrial Estate Dahej, Tal: Vagra, Dist.: Bharuch, Gujarat entrusted M/s Versatile EngiSafe Pvt Ltd. Bharuch, to conduct safety audit in their facilities so as to enable them to take necessary measures to strengthen & improve the Health and Safety Systems.

The report of this safety audit has identified certain areas where some more efforts are needed to achieve higher levels of safety performance.

Good Observations:

1. The occupational safety & health management system is found able to march towards improvement.
2. Statutory compliance of safety aspects including documentation is satisfactory and management is committed to follow statutory and non-statutory safety aspects.
3. ETP is there for environment protection.
4. Housekeeping is well maintained.
5. Public address system is provided for better communication.
6. The employees have been trained for the process operation.
7. The firefighting devices like sand bucket, fire extinguishers, fire hydrant etc. are provided in the process area.
8. The employees have been issued the required personal protective equipment to be worn while on the job.
9. Weekly safety communication meeting by Site leadership with employees and contractor workers is good initiative for employee involvement.
10. On-site emergency plan is well prepared complying the provisions under FA section 41-B and GFR 68-J (12).
11. The mock drills are also scheduled and executed complying the provisions under FA section 41-B and GFR 68-J (12).
12. Environment related legal compliance is carried out meticulously. The work place monitoring is being done in compliance with FA Section 7-A (a) (e) and GFR 12-B.
13. MOC implementation and closing related documentation at all stages were evident at plants and HAZOP was found done.
14. The WP procedure implemented and compliance found visible in field during field visit in all the plants. Work Permit was found with compliance to FA section 64, Part-II, Schedule-XIX and GFR 68-E & GFR 89 to 91.

Area of Improvement:

1. Display of safety policy shall be ensured at strategic location and employees shall be made aware about the safety policy of company.
2. Process as well as emergency shutdown procedure related drills/ table top exercise needs to be conducted and recorded. Employees shall be made aware about such drills.
3. Tank safety is one of the most critical points in PSM. More awareness / training is required for staff.
4. Along with the fire and safety requirements necessary arrangement shall be provided to control the spillage of chemicals. Spill contingency plan is not available to handle tank overflow case.
5. plant operators shall be provided systematic tool box talk on hazards associated and risk while handling the chemicals. Do's and Don'ts and handling procedure shall be displayed at strategic locations.
6. A procedure for the checking, inspection, validation and time frame for with scaffolding are to be kept in the area, keeping escape routes free, etc. shall be part of the SOP prepared. Also inspection of scaffold material, clamps, platform clamps shall be part of SOP.
7. The permit procedure is required to be reviewed and revamped. Confined space atmosphere and isolation shall be checked as per the matrix and in compliance to the requirement of section 36 of 'The Factory Act'.
8. The entry in the license premises shall be restricted. The PESO approved license premises shall have required caution display boards. The area shall be kept under lock and key with defined responsibility.
9. ESO shall be designated as per CEA regulation. The Legal matrix shall be revised and reviewed for including the requirements of CEA regulations.
10. Isolation permit shall be separated and format shall be prepared as per the relevant IS.
11. TREM card shall be prepared for the chemicals transported from site. It shall be given to the driver of the vehicle through with the chemical is transported.
12. No lifting tools and tackles of contractor, without form 10 shall be allowed inside the site.
13. TNI shall be defined for each employee and its monitoring mechanic shall be developed. Roles, responsibilities and duties and notification letter for SO,ESO, Welfare officer and factory manager shall be kept easily accessible.
14. The medical test for drivers and food handlers, height worker shall have specific test to be defined.
15. Contractor safety management system should be developed & implemented. Their working area & hazards must be informed them before giving any job.

2: INTRODUCTION & COMPANY PROFILE

INTRODUCTION

Chemicals and petroleum industries have undergone considerable changes during the last two decades. During this period plants have grown in size, the process has become more complex and interlinked and the inventory of hazardous chemicals increased to meet the demands of the society. These factors have greatly increased the hazard and loss potential both in human and in economic terms. Such loss may occur in various ways. The most obvious is the major accidents, usually arising from loss of containment and taking the form of serious fire, explosion or toxic release of chemicals. With the growing scale and complexity of modern plants the danger of serious large scale incident has been a source of increasing concern. In the interest of accident prevention and the observance of the related legislation it is the responsibility of the occupier to make the plant inherently safe, to provide a safe place of work and operate safe systems of work. Safety audit is an important tool of the management to evaluate the effectiveness of safety and health system. It is increasingly being used by the management of not only the chemical plants but by all concerned to evaluate the strength and weakness of health and safety system in their organization. Safety audit is also an important tool for identifying falling standards, areas of risks or vulnerability, hazards and potential accidents in proposed and existing plants and processes, the action necessary to remove hazards before personal injuries or damage occur; and for ensuring that the whole safety effort of the company is effective, meaningful and the objectives understood.

In view of past accidents in chemical industries in the country over a few decades, a specific legislation covering major hazard activities has been enacted by government of India in 1989 (MSIHC Rules 1989) in conjunction with EPA 1986. One of the important provisions of the MSIHC Rules and of the Factories Act 1948 & the Gujarat Factories Rules 1963 is the preparation and filing of safety audit report by the organization.

With this back ground the management of **M/S GUJARAT FLUOROCHEMICAL LIMITED, SITE-A, DAHEJ**, Plot No: 12/A, Industrial Estate Dahej, Tal: Vagra, Dist.: Bharuch, Gujarat requested to carry out safety audit of their works.

WHY SAFETY AUDIT?

Various indices for attempting to assess the results of a company's safety activities are well known. They include injury frequency and duration rates estimating financial loss due to fire and other damage accidents and recording the number and types of injuries. All these methods have certain things in common; they are quantitative and because they measure results only, are not always strictly related to the quality of a company's safety effort.

What is needed, there for, is a method which will give a reasonable indication of how well a company's safety programme is working in all its aspects, how hazards are being recognized and controlled, how unsafe acts and conditions are being eliminated. How accidents are being avoided, without using only failures as the yardstick.

COMPANY PROFILE

An ISO 9001:2015, ISO 14001:2015, ISO 45001:2018 and SA 8000:2014 certified organisation, GFL is a leading producer of Fluoropolymers, Fluorospecialities, Refrigerants and Chemicals for applications in varied industries. GFL derives its strength from expertise in Fluorine Chemistry, vertical integration from natural minerals to Fluoropolymers and strong R&D, enabling it to provide one of the best quality products meeting all regulatory compliances, to our clientele globally.

The year 1989 marked commencement of Company's commercial operations with India's largest Refrigerant manufacturing unit at Ranjitnagar, Gujarat, India. The site was further expanded to produce Fluorospeciality products catering to the growing demands in global agriculture and pharmaceutical industry. Foraying into new avenues in 2007, with one of the world's most integrated facilities at Dahej, Gujarat, India, GFL now has a diverse portfolio of Fluroropolymers comprising PTFE, PFA, FEP, FKM, PVDF and Fluoropolymer Additives.

With three manufacturing facilities in India, a captive Fluorspar mine in Morrocco, offices and warehouses in Europe and USA, and a marketing network spread across the world, GFL is one of the established players in Fluoropolymers and Fluoro specialities markets.

Our Sustainability goals are interwoven with the way we do business all along our value chain. The company is signatory to the United Nations Global Compact (UNGC), and is a member of the Indian Chemical Council (ICC). Our focus on Health, Safety and Environment is reflected in the wellbeing and safety of our people. All-inclusive efforts towards sustainability at various facets make us long-term partners for our customers across geographies..

NAME AND ADDRESS OF FACTORY

M/s Gujarat Fluorochemicals Limited
12/A, Industrial Estate Dahej,
Tal: Vagra, Dist.: Bharuch, Gujarat

NAME AND ADDRESS OF OCCUPIER:

Mr. Sanath Kumar
12/A, Industrial Estate Dahej,
Tal: Vagra, Dist.: Bharuch, Gujarat

NAME AND PHONE NUMBER OF THE FACTORY MANAGER:

Dr. Sunil Bhatt
12/A, Industrial Estate Dahej,
Tal: Vagra, Dist.: Bharuch, Gujarat

NO OF EMPLOYEES

Total Employment: Above 5000

PROCESS DECRIPTION:

A. Chlor-Alkali Plant

This plant is designed to produce Liquid Chlorine of 337 MT / Day and Caustic Soda of 11400 MT / Month based on state of the artIon-exchange membrane cell process developed by Asahi, Japan. The Chlor-Alkali plant is designed to produce 380 TPD caustic soda based on the Ion Exchange Membrane Technology. In the electrolysis process, hydrogen gas and caustic soda are produced in the catholyte compartments. Chlorine gas is produced in the anolyte compartments. Hydrochloric Acid is manufactured from Cl2 and H2 gas generated in the electrolysis process, in hydrochloric acid synthesis unit. The process consists of following sections:

1. Primary brine purification,
2. Secondary brine purification,
3. Electrolysis,
4. De-Chlorination,
5. Caustic Soda Evaporation,
6. Cl_2 gas washing &cooling, drying,
7. Cl_2 gas compression and liquefaction,
8. Cl_2absorption,
9. H_2 gas washing
10 Chlorine Synthesis

The Chlor-Alkali Plant is controlled by DCS to provide an Integrated Plant Control with following associations:

i. Distributed Control System (DCS)
ii. Safety Interlock System
iii Remote Control Panel for rectifiers
v. Instrument Panel with monitoring and alarm modules, recorder for Cl2 and H2 gas Pressure /differential pressure

Brine solution is used as feedstock, and it is purified in order to remove impurities before sending to Electrolysis Unit. Raw salt is dissolved with return brine solution from electrolyzer, and it is sent to Reactor with sodium carbonate, barium carbonate and caustic soda to exchange the calcium, magnesium and other multivalent ions present in the raw brine. After this reaction, brine solution flows into clarifier to settle suspended solids and the clear liquid is sent to Pre-coat type ceramic filters and Ion-exchange column for further purification. Electrolysis Unit is composed of Electrolyzer, Anolyte and Catholyte circulation facilities. Each electrolyzer of 142 cells is designed to produce 385 ton/day of Caustic Soda as 100% at the current density of 6.0 kA/m2. The purified brine is supplied to anolyte compartment, where the chlorine gas (Cl2) is generated and then sent it to Catholyte compartment, where hydrogen gas (H2) and Caustic Soda are produced. Wet Cl2 undergoes washing, Cooling, Drying and Compression processes and finally stored in a Liquid Cl2 Storage tank by

Liquefaction process. Wet H2 gas from the Electrolysis is sent to H2 gas Scrubber. The depleted brine from the electrolysis section is pumped to De- chlorination Tank, which is kept under vacuum by Steam Ejector. The dissolved Cl2 is stripped together with water vapor and is cooled in De- chlorinationCooler.TherestillremainsasmallamountoffreeCl_2, which is removed by adding Sodium Sulfite solution. Then, the brine is sent to Primary Brine Purification section. Caustic soda solution from Electrolyzer is fed to Caustic Evaporation Unit for purification. Various raw materials required such as NaCl, Flocculent, Sodium Carbonate, Barium Carbonate, Hydrochloric Acid and Sulfuric Acid are stored in separate storage areas. Utilities such as Steam, Nitrogen, raw water and DM water are supplied from the main utility area. Chilled water and cooling water requirement is met by dedicated chilled water and cooling water plants located in the caustic soda plant area. Chilled water consumption in the plant is about 300 m^3/hr. and plant capacity is 250 TR. Cooling water consumption in the plant is approximately 2000m^3/hr.

B. Chloromethane Plant

The CMS Plant is designed to produce 310 TPD of Chloromethane which are Methylene Dichloride, Chloroform and Carbon tetrachloride. The process is carried out in two stages:

Hydro-chlorination in which Methanol gas reacts with HCl gas to produce Methyl Chloride (exothermic reaction) and Therma Chlorination of Methyl Chloride with Chlorine to produce Methylene Dichloride, Chloroform and Carbon Tetrachloride as per the requirement by altering the feed ratios. The main product produced is Chloroform and this is fed as raw material to the existing R-22 Manufacturing. The process consists of following sections:

i. Hydro Chlorin section Unit.
ii. Chlorination Unit.
iii. Product Rectification Unit.
iv. Hydrogen Chloride Absorption Unit.
v. Regeneration and Drying Unit.
vi. Acid and Alkali storage Unit.
vii. Refrigeration Unit.
viii. Steam and Condensate Recovery system.

The CMS Plant is controlled by Distributed Control System to provide an Integrated Plant Control with following:

1. Safety Interlock System
2. Remote Control Panel for rectifiers.

The feedstock Methanol (CH_3OH) and Hydrochloride (HCl) react to produce Methyl Chloride in Hydro chlorination unit. This product is sent to Chlorination unit with Chlorine gas (Cl2). Both of them undergo thermal chlorination and produce a mixture of Dichloromethane, Chloroform (CHCl3) and Carbon Tetrachloride (CCl4). This product mixture is rectified in Rectification unit and dried by azeotropic drying. Most of the by-product HCl from chlorination unit is again sent to hydro chlorination unit and the excess HCl is absorbed in HCl absorption unit. This absorbed HCl and process water formed concentrated hydrochloric acid, which is then stripped in the organic stripper to remove organic matters.

The off-gas containing HCl and Cl_2 are neutralized with NaOH and water. The spent NaOH containing Chloromethane (CMS) mixtures and off-specific CMS are collected and re generated through CMS dryer and sent it to product rectification unit. According to process requirements, exhaust condenser in the hydro chlorination unit, chlorination unit and refrigeration unit adopt R-22 evaporation to exchange heat with the process fluids. In addition to that, storage tanks receive and store concentrated sulfuric acid, dilute NaOH and dilute H_2SO_4 as needed in major process units.

Steam and Condensate recovery system is also provided to recover steam condensate from the plant. Various raw materials required such as Methanol, HCL, NaOH and Sulfuric Acid are stored in separate storage areas. Utilities such as Steam, Nitrogen, raw water and DM water are supplied from the main utility area.

C. TFE, PTFE and PT- PTFE Plants

This plant is to manufacture TFE, PTFE, PT-PTFE and DPTFE using captive available R 22 of about 112 MT/day as the feed stock for the production of TFE and to produce PTFE resin. The annual production capacity on the basis of 300 working days per year is TFE of 7,680 TPA and PTFE of 1650 MT/Month.

The PTFE plant is designed to produce 1650 MT/ Month of Poly Tetra Fluoro Ethylene i.e., suspended middle grain and fine grain PTFE resin. The process is mainly carried out in two stages:

i. Thermal cracking of R-22 with over-heated steam to produced TFE.

ii. Polymerization of TFE with De-ionized water and reduction – oxidizing system to produce PTFE.

The process consists of following sections:

1. TFE monomer metering.
2. Suspension polymerization.
3. Crushing, washing and drying of PTFE.
4. Air- jet pulverization process.
5. Packing and storage.

The PTFE Plant is controlled by DCS to provide an Integrated Plant Control with following associations:

1. Distributed Control System
2. Safety Interlock System

Fresh and recycled Chlorodifluoromethane (R22) is mixed in a vessel and enters into Steam heating furnace and to the Reactor for cracking. Cracked gas is composed of C2F4, HCl, un-reacted R22, excess steam and traces of other cracked products. They enter into a Graphite condenser after rapid cooling in a Quencher. The excess steam and HCl are condensed to form dilute hydrochloric acid and transferred to either neutralization chamber or storage vessel. Uncondensed cracked gas is neutralized and then sent to a buffer tank.

The cracked gas enters into the three-stage compressor unit through a buffer tank, cooler and refrigeration dryer to remove excess moisture. The dry process gas is sent to rectification units for further purification of TFE monomer after de-oxidation process and sent to storage tank through condenser. The un-reacted R 22 from rectification units is recycled to the reaction system. Liquid TFE monomer is sent to Polymerization reactor with de-ionized water after heating, vaporization and compression. The PTFE polymer with mother liquor from reactor is sent for crushing, washing by fresh de-ionized water and drying. Further, PTFE resin is sent, to and dried in the hot air blowing and cold air blowing system and finally it is separated according to its size in a cyclone separator.

post treated PTFE (PT-PTFE) is obtained from following methods depending upon customer requirement. The middle size PTFE resin is fed to air jet mill continuously and smashed by accelerated impact and obtained PT- PTFE's grain size is varying from 10 to100 Microns. Dry PTFE powder is treated in Heating Ovens at various temperatures to get desired quality of PTFE as per Market requirement. Dry powder is treated in Reactor along with water and Perchloro-ethylene at various temperatures to get the properties of free-flowing PTFE powder.

Various raw materials required are TFE, Aqueous alkali, Disodium hydrogen phosphate, Ammonium per sulfate, Sodium bisulfate, Ferrous sulfate, De-ionized water and Silica gel. Utilities such as N2, Instrument Air and Process Air, cooling medium (-15oC CaCl2 Brine, - 35oC CaCl2 Brine, -5oC aqueous Ethylene Glycol), Saturated steam, Electricity 3- phase and Compressed air are supplied from the main utility area.

D. Captive Power Plant

GFL has set up a 26MWCo-generation plant, which represents the combined production of heat and power through a c

This plant is designed to produce electric power for captive power requirement, process steam through waste heat recovery boilers using hot flue gases coming out of the gas turbines. In addition to that the plant has been designed to operate its gas turbines with augmented output by means of reducing the sensible heat and partially reducing the moisture in the combustion air through the Vapor Absorption Machines (VAM) of 330 TR capacity driven by the hot engine jacket cooling water. Fuel is natural gas with Methane number greater than or equal to 70.

The minimum and maximum gas pressures for operation are 3.5 and 6 bar (g), respectively. Steam is produced at the net rate of 195000 kg per hour and at a pressure of 12.0 kg/cm2 (g) and temperature of 191°C. Makeup water is added at 65°C and 4 kg/cm2 (g).

E. A & H Plant

Process Description of HCFC R-22 for TFE feedstock

Anhydrous Hydrofluoric Acid, for captive consumption, is manufactured by reacting Fluorspar with a mixture of Sulphuric Acid and Oleum. Wet Fluorspar is fed to the inlet of Flash Dryer. The dry Fluorspar from Cyclone is fed to the Rotary Kiln through the Storage Silo. The Fluorspar, after drying, is fed to the Rotary Kiln along with a mixture of Sulphuric Acid and Oleum, to produce AHF and By-product Gypsum (CaS04) as per the following reaction:

Heat
CaF2 (5) +H2S04(1)> 2 HF(g) + CaS04(s)

The reaction is endothermic and there is no possibility of any run-away reaction.
The Rotary Kiln is indirectly heated by hot flue gases. The Gypsum from the Kiln is neutralized with Lime and discharged as By-product.
The HF vapor is passed through the Kiln Column. The clean HF from the Kiln Column is condensed in HF condensers by means of Refrigeration. The crude condensed HF liquid is fed to the Distillation Columns through Crude HF Storage Tank. Pure AHF is withdrawn and sent to receiving tank after due Analysis.
The entire HF Plant is kept under negative pressure and there is no possibility of leakages of HF from the equipment to the atmosphere.
Raw Materials Anhydrous Hydrogen Fluoride (AHF) and Organic CHCI3 for R-22) are fed to Reactor (01). The Reactor contains special Penta chloride Catalyst which is used to catalyze the reaction between. AHF and Organic to produce Refrigerant gas as per the following reactions:

$CHCl_3$ (I) +2HF(I) >CHCIF2 (g) + 2HCI (g)(R22)

The Crude Refrigerant gases from Reactor enter the Stripper (02) to condense and return unconverted Reactants. CHCl3 to the Reactor.

From Stripper, Crude gas mixture enters HCI Distillation Column (03). Top product of Distillation Column enters HCI Absorption Unit, which consists of Alumina Towers (07, 08), HCI Absorber (09) and Tail

Tower (10). Here, HCI is generated by counter current absorption with water. The bottom product of the Distillation Column (03) enters exchanger where it is mixed with organic and is finally collected into Phase Separator (04). The top layer of the Phase Separator (04) is collected into the AHF Storage Tank (05) and is finally re-fed into the Reactor (01). The bottom layer of the Phase Separator enters Heavies Recovery Column (06). The bottom product of the Heavies Recovery Column (06) is stored into Heavies Tank and is finally re-fed into Reactor (01). The top product of the Heavies Recovery Column enters HF Absorption Column (11) where traces of HF are absorbed into Sulphuric Acid and output of the HF Absorption Column enters into Alkali Towers (12, 13) where the Crude gas is scrubbed with Caustic Soda Trisodium Phosphate. The Crude Gases are then dried in Acid Drying Towers (14, 15) where Moisture, is absorbed by circulating Sulphuric Acid, The bottom product of Non condensable Column enters 1st Distillation Column (20), where R-22 is withdrawn from the top as Final Product, bottom from the Column(20), whichmainlycontainsHighBoilerssuchasR-21andCHCl3isrecycledtotheReactor (01), The Finished Product Refrigerant Gases withdrawn from respective Column tops are then sent to the Daily Storage Tanks. After duly approval of the Quality, the R-22 is sent to final storage for TFE feed stock.
The 32 % HCI obtained from the Absorption Unit is taken to the Storage Tank from where it is sold to Customers. The Spent Liquor from Alkali Tower is taken to Effluent Treatment Plant, for suitable treatment and disposal. The Spent Sulphuric Add from Acid Drying Tower (14, 15) is mixed with Oleum to make up the strength (11) is stored Into Sulphuric Storage Tank T-3107A/B and is finally fed to the Kiln.
Equipment reference no. is mentioned in block diagram of Plant-H.

F. Recovery Plant -1

In the manufacturing of PTFE, TFE is polymerized in DI water with the help of Initiators. Fluoro surfactant is present as the dispersing medium. This Flour surfactant remains in the Latex coming from the reactor. This Fluoro surfactant has to be removed from the Product before it is sent to the market. For this following process is followed.

a. First secondary surfactant (Tegretol) is mixed in this Latex. So that the product becomes stable. This Tegretol is Non-Fluorinated surfactant and can remain in the product as a stabilizer for the product

b. So, after Adding this secondary surfactant the primary surfactant is removed by passing this liquid through ion exchange columns. Where the primary surfactant is captured by ion exchange resin and final product without Primary surfactant goes for further concentration and packaging of the product.
c. Now the resin contains this primary surfactant which has to be removed and to be recycled back to the process.
d. For removing the surfactant from resin solution of Ammonium Chloride 2%, Methanol 70% and water 28% is passed through this column. So, the surfactant get transferred to the is solution
e. This solution now contains mixture of following:

1. Surfactant
2. Methanol
3. Water
4. Ammonium Chloride

Methanol is separated by distillation under vacuum so that the se can be separated and all can be re used and

can be recycled back to process. The methanol recovered has concentration of around 70 to 80 % which cannot be used in the process.

F. $CaCl_2$Plant

Calcium chloride is one of the most versatile of the basic chemicals. It has been produced commercially for well over the years. The properties and characteristics of Calcium chloride make it useful in a large number of applications. Commercially Calcium chloride is produced in following forms. Liquid Calcium chloride is manufactured in concentrations of 20%to45% and it is also available as 32% food grade formulation.

The object this plant is to utilize of Hydrochloric Acid by neutralizing it with Calcium Carbonate. The Calcium Chloride is produced by the reaction of Calcium Carbonate (CaCO3) with 32% Hydrochloric Acid in a Reactor. The resulting 35% Calcium Chloride solution is produced & further it is neutralized with lime to make it free from any acidity. It is also Clarified/ filtered to remove all suspended impurities. The clear Calcium Chloride solution is then can be transferred for further use in evaporation or granulation plant to make anhydrous/ solid material. The Calcium Chloride in the form of powder / granules / flakes are easily transportable & salable in the market in India & abroad.

Process- Calcium Chloride

The Calcium Chloride is mainly produced commercially by Limestone & Hydrochloric Acid reaction. The other production processes such as recovery from by product or naturally available forms are not covered here.

Limestone-Hydrochloric Acid Process

Limestone can be treated with hydrochloric acid to form calcium chloride and carbon dioxide:

$CaCO3+2HCl \quad CaCl2 + CO2 + H2O$

If concentrated (32%) hydrochloric acid is utilized, the concentration of CaCl2 in the produced solution will be approximately 32% and further evaporation is only needed when flakes/ granules are produced. The purification of the product is mainly accomplished by adding Ca (OH)2 as described in the natural brine process.

$Ca(OH)2+Mg2+ \quad Mg(OH)2 +Ca2+$

The high purity of the produced carbon dioxide (CO2) makes it suitable for applications within the food and pharmaceutical industries e.g., in the production of carbonated soft drinks. Extremely pure calcium chloride products can be obtained using this process if the purity of the hydrochloric acid is sufficient. Hence, the process is well suited for producing food grade products. It is also an environmentally friendly method to utilize by-product hydrochloric acid.

Design Basis

The design of the process is based upon the following steps: neutralization of hydrochloric acid with limestone to produce a 35% calcium chloride solution. If required, concentration of the CaCl2 Solution to more than 50% using a double effect evaporation system, production of flakes using the flaker, calcinations of the flakes in a rotary calciner to further concentration & packing. Alternatively, 35% calcium chloride solution directly fed to Spray Dryer / Granulation Plant.

Neutralization of HCL

The neutralization of HCL with limestone is carried out as explained above to produce CaCl2 and Co2 as by product. The CaCl2 solution which contains un-reacted solids (impurities from the limestone) settled down in bottom of the Reactors which can be removed by drain Valves / manhole periodically to settling pits. The CaCl2 solution which contains un-reacted solids, free acid and Chlorides of other undesirable metals like Magnesium etc. (impurities from the limestone) flows by gravity to Clarifier through retention tank. Milk of Lime Solution is dosed in Reaction Tank wherein the Milk of lime reacts with free acid and other metallic chlorides. The Calcium Chloride solution becomes neutral and other metallic chlorides converted in to metallic hydroxides which are insoluble in water.

Clarification / Filtration:

The neutralized Calcium Chloride Solution impurities get settled down in Clarifier which is continuously containing insoluble impurities. The Flocculent is added in the Solution overflowing from Retention Tank to Clarifier. The undissolved solids get settled down at the

bottom of Clarifier which are intermittently discharged into settling pit. The overflow from Clarifier is discharged into Calcium Chloride Solution Storage Tank. The neutralized clear solution Calcium Chloride can be filtered by Inline Polished Filter and transferred for further process of Concentration and granulation. The sludge is filtered in a separate filter Press where the cake builds up on the filter cloth. The filtrate is collected in filtrate tank and the solids are discharged.

CO2 Washing and Cleaning

The CO2 gas is transferred to CO2 Liquefaction Plant for further processing. At CO2 Plant it passes through the Scrubber & demister free of the droplets. The Washed CO2 is then discharged to further processing for Liquefaction & Dry Icing Plant or vent off to the atmosphere.

G. CO_2 Plant

Purifying system

Two lines of CO_2 gas is mixed in buffer tank (V0101) then transferred to washing tower (T0101) to remove the HCl. The washing tower has two stages for washing. First, to wash with circulation water by washing pump (P010A/B), then to purify with primary water, so to ensure HCl content can satisfy requirement. Washing pump is one in run one stand-by. The washing tower level is automatically controlled and can control the washing effect by controlling the level. After washing, the gas goes into separator (S0101) to separate saturate water, and then it is compressed by compressor(C0101A/B).

CO2 gas is compressed to 2.4~2.7 MPa and dehumidified by dehumidifier (E0101), to remove part of water by decreasing temperature, so to increase molecular sieve adsorbing time and enhance the adsorption effect. Dehumidifier (E0101) is cooled by utilizing the vent gas from reflux tank (V0102) and distillation tower (T0105)

Outlet gas from dehumidifier (E0101) is dried by dryer (T0102A/B), inside which we use 3A molecular sieve, and the dryer is one in run one stand-by. When the moisture of molecular sieve is 15ppm, the dryer shall be switched and regenerated. The air is heated by electrical heater (F0101) then blown by a blower (P0102). Hot air passed from the bottom of molecular sieve layer and takes the moisture away. The outlet temperature is 2000C, when the outlet temperature T10102 reaches 1200C or complete regeneration after 30min over 1000C, then stop regeneration process. To cool down the dryer, we use vent gas from dehumidifier (air is not allowed for cooling). To finish the cooling process when the T10102 temperature is ambient, then slightly open the outlet valve of dryer to press and then close for standby.

Dried gas is transferred to pre-rectifying tower (T0103) reboiler (E0102) for heating, part of the inlet gas before reboilering (E0102) goes into bottom of distillation tower (T0105) and heated, then gather with the gas and from the bottom of distillation tower, goes into pre-rectifying tower, where to remove the heavy component in gas. T0103 is cooled and washed

by using the liquid from reflux tank (V0102). We control the outlet temperature TICA0106 as - 150C by controlling the liquid level, then the gas pass through absorber (T0104A/B)
Absorber (T0104A/B) can remove the heavy component which cannot be removed by pre-rectifying tower (T0103), and it is one in run one stand-by. Absorber regeneration shall be as per gas component data. Adsorbed is cooled by using the vent gas from dehumidifier (E0101). If insufficient, open the line PG0107A. (Air is not allowed for cooling). The process and parameter is the same as dryer regeneration operation.

Gas from absorber (T0104A/B) is transferred to liquefier (E0103), then to reflux tank (V0102) for primary gas liquid separation. Liquid Co2 in reflux tank divides into two parts, one goes to pre- rectifying tower (T0103) by reflux pump (P0103) and one goes into distillation tower (T0105). Co2 is controlled in distillation tower by level.

The distillation tower is heated by bottom coil; light part is vent from top and high purity liquid Co2 comes out from bottom. After testing, qualified Co2 liquid is transferred to storage tank for filling.

Refrigeration system
The low pressure NH3 gas from liquefier (E0103) goes into NH3 compressor (C0201A/B) and compressed to high pressure, high temperature NH3 gas. Then it is transferred to evaporative condenser (E0201) and changes to normal temperature, high pressure NH3 liquid. The liquid NH3 goes into siphon tank (V0202) and then to storage tank (V0202), and goes back to E0103 for evaporation, repeating the cycle.

Oil is cooled by Liquid NH3 in NH3 compressor (C0201A/B). LNH3 is from the bottom of siphon tank (V0202), GNH3 return to V0202 and then goes into evaporative condenser (E0201), repeating the cycle.

Storage
Liquid CO2 from storage tank is filling into truck by filling pump, to reduce loss in this process and truck gas line can be connected with storage tank gas line (VT0302), to make the gas return to storage tank, further goes back to compressor (C0101A/B).

H. FKM Plant

Hexafluoro propylene and Vinylidene fluoride are the main monomers for producing FKM 2,6 rubber. These two monomers in gas form taken in 02 nos. monomer mixing tanks among which one is dedicated for reactor pressurization and the other is for polymerization. The composition of these tanks is different and maintained as per recipe. After preparation of gas mixture, it is fed to Polymerization reactor by the gas compressor. Reaction pressure and temperature maintained as per recipe value. After feeding the recipe amount of monomer mixture feed is cut off and the reactor is vented till the pressure

comes to atmospheric pressure. During this venting process reactor is also cooled to 30°C by cooling water circulation through reactor jacket. After that latex formed in the reactor is discharged to degassing tank where degassing done by evacuation and nitrogen flushing simultaneously and the latex temperature is further cooled down to 20-25°C. Then after checking viscosity of the latex it is transferred to latex storage tank. It is stored there till the downstream is ready. Then this latex is coagulated in coagulator by adding coagulant into coagulator. By this process polymer gets separated from the latex and it is transferred to washing tank where vigorous washing is done of the polymer. Washing continued till the wash water effluent pH comes above 6.0. Then the material is dumped on to a rubber tank from where the material is loaded on trays after dewatering of the polymer. The trays are then placed inside the tray dryer in which drying of the polymer takes place for 24hrs at 95°C. After drying material is weighed and packed in PPCP drums. These drums are then taken in the close mixer where additives are added for pre compounding and thereafter the material is turned into a sheet in a two-roll mill. After that sheet is cut and placed on trays for cooling (cooling is required as the material is heated up during the process of mixing and sheeting). When the sheet temperature brings down to ambient temperature then this sheet is packed in the packing boxes as per requirement.

I. ETFEE Plant

Manufacturing of E-TFEE Product Using Reaction Between 18% Ethanolic-KOH Solution & TFE Gas. The process for the ETFEE production consists of 3 steps:

1) Unloading of the Raw material into storage tanks: One of the raw materials used in the manufacturing of ETFEE is 18% KOH in Ethanol. This will be supplied to the plant by tankers which are to be unloaded into tank in an approved tank farm area.

2) Reaction: The Ethanolic KOH reacts with TFE to give the ETFEE at a temperature of 50 ± 2°C. The process steps involve

- Pumping a fixed quantity of the Ethanolic KOH into the reactor.
- Cooling the mass and qualifying the reactor to make it oxygen ree.
- Feeding the required quantity of TFE at a fixed rate and allowing the reaction to take place in controlled conditions.
- Post completion of the reaction, water addition for solid dissolution, cooling the mass and evacuating the residual gases safely. Typical batch cycle time is 8hours.
- After evacuation, the batch is transferred to a hold vessel and thereafter to the designated tank in approved tank farm.

3) Loading of Product into tanker: The crude product made in the process is sent via tankers to Ranjit Nagar facility for purification and ethanol recovery.

J. R-125 (Penta Fluor ethane)

The process includes CO removal, raw material metering, reaction, compression, distillation, drying, recovery, HFC-125 metering and storage. Refer to P&ID (BD1601-301～312) for details.

5.2.1 CO Removal

The gas from LV-1 MSU of TFE plant, under normal temperature and pressure of1.3kg/cm2 enter to the pre-buffer tank (V-6801), then it is cooled to 15 ℃by pre-cooler (E-6801). It is pressurized to 6 kg/cm2 by diaphragm compressor (C-6801), pass through the after cooler (E-6802) cooled to 25 ℃, then go into the after-buffer tank (V-6802). The gas enters the CO absorption tower (T-6800) in countercurrent contact with the solvent (acetic acid copper ammonia solution), the tower top gas go to the mixture buffer tank (V-6809) after ammonia removal through ammonia washing tank(V-6830) and the decompression of control valve. The CO- contained liquid after decompression of control valve at the tower go to the upside of reflux regeneration tower (T-6801). The structure of reflux regeneration tower is refluxing section in the upper, regeneration section in the middle and reducer at bottom. After deamination in water washing tank (V- 6805), the CO- contained exhaust gases from reflux section top go to the waste gas tank (V-6825) for pressure stabilization, then it is pressurized by the blower (C-6803A / B) and sent to incineration. The liquid from regenerator is first cooled by cooling water cooler (E - 6806) and then pumped by solvent recycle pump (P- 6801A / B) to solvent cooler (E-6804) cooled up to 15 ℃, then go to CO absorption column (T- 6800). If the copper ratio is too high in the solvent, add compressed air to the reducer section to regulate the ratio. If total ammonia is too low in the solvent, add ammonia downstream of cooling water cooler (E-6806). If the total copper is too low, solvent out of the regenerator pass by solvent preparation tank (V- 6803) to adjust the total copper. Set solvent collection tank (V-6804) collect copper solvent emissions during shut down and maintenance. 5.2.2 Reaction (BD1601-305～306)

5.2.2.1 Catalyst preparation

Add certain quantity of TBA in reactor (R-6841A/B) and start catalyst circulation pump (P-6844A~C) to make the liquid circulate. Add certain quantity of HF gradually by HF metering pump (P6841A~C) to form complex with TBA and the temperature is controlled by the circulating condensate in jacket. The catalyst is qualified when the mole ratio of HF to TBA reach to1.5~1.9:1.

5.2.2.2 Reaction TFE gas from TFE distillation tower(T-606) side and bottom in TFE plant and the recovered from downstream distillation system is mixed and continuously fed into the TFE stabilizing tank (V-6844). It is heated and mixed with TBA in TFE heating tower (T-6841) and then fed into reactor (R- 6841A/B) through TFE buffer tank (V-6845). The AHF is fed into reactor by HF metering pump (P-6841A~C) after metering. Catalyst continuously circulates in reactor through catalyst preparation tank (V-6849A/B). TFE gas monomer and

AHF are continuously fed into reactor to generate crude product HFC-125 under certain temperature and pressure. Crude HFC-125 gas comes out from reactor top and goes through demister cooler (E-6842) to reflux tower (T-6809) to reduce temperature. Then it goes to mixture buffer tank (V-6809) through reflux tower condenser (E-6829) for cooling.

5.2.3 Mixed gas collection, compression, dehydration and deoxidization (BD1601-307～310) TFE recovered from D-PTFE through D-PTFE buffer tank (V-6806) and TFE recovered from S-PTFE through S-PTFE buffer tank (V-6807) for pressure adjustment, then go to the mixture buffer tank (V-6809); Other continuous vent raw gas together with recovered gas emissions from distillation system go into the mixture buffer tank (V-6809).All these gas are mixed with crude HFC-125 from reflux tower. The mixture gas is compressed by the compressor (C-6802A/B), first stage outlet gas enters into the dehydrating tower (T- 6802A/B) after cooling and dehydration by cooling dehydrator (E-6807A/B). It is cooled to -10 ℃ by low temperature dehydrating agent and continued dehydrating, then into the secondary buffer tank (V-6810), then go into the compressor for second-stage compression; Second stage outlet gas is cooled by secondary cooler (E- 6809) then go into the dryer (A-6801A ~C), silica gel adsorbed water from the gas, make the gas moisture content less than 100ppm.Then it go to deoxidizing tower (T-6803) remove O2 . If the moisture content of the gas close to 100ppm changes over the dryer, and the block up dryer is activated by steam heating and vacuuming. The polymerization inhibitor terpene via terpene metering tank (V-6813), terpene pump (P-6803A / B) is supplied to the deoxidizing tower (T-6803), Make up terpene to NO.1 condenser (E-6812) by terpene make-up pump (P-6804A / B) on a regular interval and quantitative. 5.2.4 Distillation system (BD1601-310～312) Gas from the top of the deoxidizing tower (T-6803), passing through feeding cooler (E- 6810), enters No.1 rough separation tower (T-6804). TFE is recovered from sideline to TFE stabilizing tank (V-6844). Distillates from the top of No.1

condenser (E-6812), which contains NCG like R23 is sent to waste gas mixing tank (V- 6826). Trace of TFE, R32 and large quantity of HFC-125 left at the tower bottom are continuously sent to No.2 light fraction removal tower (T-6805) by discharge control valve . Light components (including trace of R32, Y3, TFE) with boiling points lower than HFC-125 are rectified from top of No.2 light fraction removal tower (T-6805) passing through the terpene tank (V-6815) and No.2 condenser (E-6815) enter into the waste gas mixing tank(V-6826). HFC-125 from bottom of No.2 light fraction removal tower goes to No.3 distillation tower (T-6806). The side-cut gases HFC-

5.2.4 125 from top of No.3 distillation tower (T-6806) is sent to product metering tank(V- 6846A/B) through collection condenser(E- 6826). The gas contain HFC-125 and trace of Y3 at No.3 condenser (E-6818) top recycle back to mixture buffer tank(V-6809).Materials at tower bottom intermittently go into recovery tower (T-6808). Higher purity HFC-125 from top of No.5 recovery tower (T-6808) goes back to mixture buffer tank(V-6809). Liquid at tower bottom are high-boiling residues. They are discharged to residue tank (V- 6816). The residues

are compressed into steel cylinder at regular intervals and sent out of battery limit to incineration unit for disposal.

5.2.5 Product storage and filling system, and tail gas scrubbing and absorbing syste（ BD1601- 310～312） When the HFC-125 in product metering tank (V-6846A/B) is qualified after analysis, it can be pumped to product storage tank (V-6847) in tank field for periodical tank wagon and cylinder filling. If the moisture is not qualified, it should pass HFC-125 dryer (A-6841A/B) for drying until the moisture is qualified, then it can be pumped to tank field. If the purity is not qualified, the gas should be recovered back to mixture buffer tank (V-6809). Qualified HFC-125 is pumped by product transfer pump (P-6848A/B) through product storage tank (V-6847) to tank wagon or cylinder. If the moisture is not qualified, it should pass product dryer (A-6842A/B) for drying until the moisture is qualified. The tank wagon and cylinder and related pipeline should be treated by vacuum before filling.

5.2.6 Three waste treatment Liquid waste is discharged to liquid waste pit (V-6820), and regularly sent to ETP for treatment by liquid waste pump (P-6811A/B).（BD1601-313） Liquid at recovery tower bottom are high-boiling residues. They are discharged to residue tank (V-6816). The residues are compressed into steel cylinder at regular intervals and sent out of battery limit to incineration unit for disposal.（BD1601- 312） Waste catalyst in waste catalyst tank (V- 6848) is stored in steel drum and regularly sent qualified third party for treatment.（BD1601- 306） All Fluoro-contained waste gas vent from plant is collected into waste gas mixing tank (V- 6826) and sent to OSBL for incineration. （BD1601-304 The acid gas from HF tanks is washed by scrubber (T-6842) and high vent. The washing liquid is discharged to liquid waste pit.

（BD1601-313） Waste silica gel and molecular sieve are nontoxic and landfill. Condensate is collected from users into condensate collecting tank(V-6819) and mainly sent to reactor(R-6841A/B) jacket for circulation and part is transferred OSBL. （BD1601-313） The heating medium systems is for No.2 reboiler (E-6814), No.3 reboiler (E-6817) and residue tank (V-6816) heating. It contains heating medium tank (V- 6817) and heating medium pump (P-6808A / B) heating medium heat exchanger(E-6843). （BD1601-313） The vacuum system consist of vacuum buffer tank(V-6818), vacuum pump(P-6809A/B). It can be expanded as per actual requirement. （BD1601-309） Where there is a high concentration of TFE, and for equipment or pipeline which is easy to explosive, safety relief facilities must be set.

K. VDF Plant

1. Cracked gas enters the primary buffer tank from atmospheric pressure gas storage after single-stage compression, then dewatered by water calcium chloride tower after drum, then through the mist eliminator and cold removal, and enters the intermediate gas storage. It enters the secondary buffer tank after two-stage compression and reaches the intermediate tank after silica gel absorber drying and pre-/mid-/end cooling.

2. The liquid phase of intermediate tank is discharged into the catcher and enters # 1 tower, low boilers on the top # 1 tower enter acetone absorption tower and then discharged into drum. Tower bottom enters # 2 tower, VDF at the top of tower enters finished product metering tank after liquefaction by collecting condenser. Tower bottom enters # 3 tower to continue fractionating and recover VDF. Liquid at the tower bottom enters # 4, remove low boilers from the tower top. Bottom material enters # 5 tower, F142b at the tower top enters F142b tank after collection, place the bottom liquid into residue tank.

3: ON SITE OBSERVATIONS & RECOMMENDATIONS

SR. NO.	PLANT	OBSERVATION	RECOMMENDATION
1.	AHF PLANT/ Lab/ Chlorine Tonner filling area	PPEs cupboard is available in control room and PPEs are being replaced / added regularly. Register is maintained for monitoring PPEs use. The same was not evident in central laboratory and chlorine tonner filling area.	PPE cupboard and its Matrix shall be ensured in all the area including laboratory, Chlorine tonner filling area etc.
2.	AHF PLANT	Yellow marking in front of panel (at least 1 meter away from operation desk).	It is recommended to keep safe guard distance (Alert) for visitors and non-operational persons from the operation desk.
3.	AHF PLANT	Review of the graphics with respect to interlock and operational logic is not evident.	It is suggested to review all Graphics with respect to logic and interlocks.
4.	AHF PLANT	Process mock drill are not considered so far towards action for emergency preparedness for process upsets.	Process as well as emergency shutdown procedure related drills/ table top exercise needs to be conducted and recorded. Employees shall be made aware about such drills.
5.	AHF PLANT	Policy is nor displayed in corridor. In control room, it is to be displayed at strategic location which can attract the employee / contract staff / visitor attention. It is found that staff is not well aware about policy.	Display of safety policy shall be ensured at strategic location and employees shall be made aware about the safety policy of company.
6.	AHF PLANT	All staircase found without toe guard facility in the pants.	The design of the railing shall be prepared as per the legal requirements and the same shall be ensued at staircase also.
7.	AHF PLANT	Plant storm water channel found full of water / mud.	cleaning of storm water and plant drains shall be ensured to avoid water logging. The flow of mud and other plant material shall be restricted over the roads.

8.	AHF PLANT	Housekeeping is very poor throughout the plant.	The house keeping shall be maintained in plant area. The material, spares, chemical drums shall be shall be stored at its designated location. For temporary storage of material a SOP and risk assessment shall be carried out.
9.	AHF PLANT	Car seal Open / Close concept is not applicable for the PSV's.	Car seal open/close concept to be applied for all PSVs throughout the plant after due consideration in PSM.
10.	AHF PLANT	AHF leakage scenario is not part of emergency plan evaluation program. to be consider as process mock drill to strengthened the emergency response plan.	AHF leakage scenario is to be consider as process mock drill to strengthened the emergency response plan.
11.	AHF PLANT	No provision of dump tank in the plant area to avoid water logging.	Dump tank – It is suggested to provide permanent facility to remove water from sump.
12.	AHF PLANT	Corrosion / faint colour observed on piping.	Painting of pipe lines shall be carried out at periodic interval.
13.	AHF PLANT	18 KL HF tank – for iso container unloading nitrogen pressure is used. PRV, PCV provided for reducing pressure.	One PSV is suggested to take care of PEV/ PCV malfunction (To avoid excess pressure in iso container). Detailed risk assessment is recommended for interlock and safety device adequacy.
14.	AHF PLANT	Staff is not well aware about MCP locations.	Awareness program is required. More training regarding importance of MCP to be imparted to staff.
15.	AHF PLANT	Escape route are found blocked, not approachable in many areas.	Escape route to be marked in corridor and plant area. The routes shall be kept clear and approachable all the time.
16.	Fluouro Intermediate	Operating staff is not well aware about tank safety.	Tank safety is one of the most critical points in PSM. More awareness / training is required for staff.

17.	Fluouro Intermediate	4 atmospheric tanks with nitrogen blanketing are provided for storage of different product / by product. One smoke detector provided.	Along with the fire and safety requirements necessary arrangement shall be provided to control the spillage of chemicals. Spill contingency plan is not available to handle tank overflow case.
18.	Fluouro Intermediate	NFPA diamond provided on tanks. MSDS of the chemicals is found missing at many locations.	It is suggested to provide display board showing information about NFPA diamond. It is recommended to prepare COSHH manual. Awareness sessions on chemical safety needs to be conducted as a part of class room as well as tool box sessions.
19.	Fluouro Intermediate	Tank dyke capacity and its reach seems to incapable of handling the spills with in the dyke.	The dyke design shall be reviewed for its capacity and arresting the spills within the dyke with reference to the available Indian standards and statutory requirements.
20.	$CaCl_2$ 1/2/3/4	Housekeeping is very poor; it is unsafe to enter operating area.	Housekeeping to be maintained.
21.	$CaCl_2$ 1/2/3/4	Chute 10 Nos for plant 1 & 3 AND Chute 10 Nos for plant 2& 4 are provided. Extremely unsafe operation being carried out to drain out unreacted lime stone – Bottom man hole is opened to drain out lime stone when chute is full.	This is one of the most dangerous and highly risky (non-tolerable) activity being carried out without proper risk assessment. Required modification is suggested to staff to make it safer.
22.	$CaCl_2$ 1/2/3/4	Structural stability seems to be poor to be checked on top priority.	It is recommended to check the structural stability of buildings, critical plant equipment and foundations.
23.	$CaCl_2$ 1/2/3/4	Acid proof tiling found damaged for all 20 Chutes.	Acid resistance tiles shall be ensured at all such locations where ever it is found damaged.

24.	$CaCl_2$ 1/2/3/4	D-160 tank dyke modification work was in progress. Dyke capacity to be cross checked with design capacity required.	The dyke design shall be reviewed for its capacity and arresting the spills within the dyke with reference to the available Indian standards and statutory requirements.
25.	$CaCl_2$ 1/2/3/4	Spill contingency plan is not made to handle tank over flow / leakage case.	Spill contingency plan shall be prepared and same shall be a part of ERDMP.
26.	$CaCl_2$ 1/2/3/4	Lime solution tank rubber lining is physically checked internally.	It is recommended to be cross verify the mechanical integrity of tank and rubber lining through external competent agency / CES as per the guidelines of agency who provided rubber lining.
27.	FKM Plant	It is found that staff is not well aware about policy.	Safety policy shall be displayed at strategic location for awareness.
28.	FKM Plant	Escape route to be marked in corridor and plant area.	Escape route to be marked in corridor and plant area. The routes shall be kept clear and approachable all the time.
29.	FKM Plant	Process mock drill are not considered so far towards action for emergency preparedness for process upsets.	Process drill shall be performed as a table talk exercise and evaluated for preparedness.
30.	FKM Plant	All staircase found without toe guard facility in the pants.	To be provided to avoid accidents – A step towards achieving zero accident target.
31.	FKM Plant	It is found that the awareness about chemical safety is not to the required standard.	It is suggested to provide extract of hazards associated with product-on product label. COSHH manual shall be prepared.
32.	SPTFE, PFA, PTPTFE plants	During interaction with HOD, it is found that targets/goals clearly marked and circulated to staff with responsibility and action plan. Progress is also measured and noted clubbed with performance of individual.	Good practice

33.	SPTFE, PFA, PTPTFE plants	All three plants housekeeping is very good with compare to others units visited.	Good practice
34.	SPTFE, PFA, PTPTFE plants	Staff is aware about PSM requirement. Still scope is available for improvement.	Area of improvement.
35.	SPTFE, PFA, PTPTFE plants	20 numbers of pressure vessels are used in the process. The records of inspection as per the PESO requirement is not evident.	To be inspected as per PESO requirement.
36.	SPTFE, PFA, PTPTFE plants	The product being handle in PV is explosive by nature, gas sensor is provided after RD provision to detect leakage.	1. It is suggested to provide pressure transmitter with low range as a second layer of pressure safety to sense leakage due to RD rupture due to over pressure / RD failure due to aging effect. 2. Flame arrestor on vent line to avoid back fire to system.
37.	SPTFE, PFA, PTPTFE plants	There is no level safety (weight) provided except flow control valve cut off facility.	It suggested to provided second layer of level safety. It is suggested to think about providing non-contact type (Radar) LT.
38.	SPTFE, PFA, PTPTFE plants	In PTPTFE plant risk assessment checked. Guidance given to how same can be used for tool box talk / table talk .	plant operators shall be provided systematic tool box talk on hazards associated and risk while handling the chemicals. Do's and Don'ts and handling procedure shall be displayed at strategic locations.
39.	FAM Plant	Staff is not aware about equipment (e.g., Extruder) safety.	More technical training is required to improve operation knowledge resulting in improvement in mechanical integrity.
40.	FAM Plant	Escape route to be marked in corridor and plant area.	Escape route to be marked in corridor and plant area. The routes shall be kept clear and approachable all the time.

41.	VDF Plant	Electrical furnace operation and hazards associated were discussed in field.	1. It is suggested to provide personal protective insulation on outer cell to avoid burn injury. 2. Arrangement of flame arrestor on vent line going to open vent.
42.	VDF Plant	Compressor operation discussed. Staff gave satisfactory answer to query raised.	Good practice
43.	VDF Plant	VDF storage – Water sprinkler system auto operation is clubbed with fusing of quartzite bulb.	It is suggested to interlocked auto operation with gas detectors (2 numbers) which are already provided in plant.
44.	FE Plant	Furness operation discussed.	1. Staff is aware of operation but more technical training is required to enhance knowledge.
			2. Flexible hose is used to connect FG line to burner assembly – Only hard piping with suitable MOC to be used.
			3. Gas detector to be provided for each furnace at ground level to detect FG leakage.
			4. Furnace is being operated but efficiency is not monitored.
			5. Auto operation of Furness (various parameters like draft, out let temperature etc.) to be think about to increase efficiency resulting in energy saving.
			6. Check point to be prepared for start-up of furnace for field staff – Not fully aware start-up of furnace
45.	HR	Training needs identification is SAP based but base and training topics are not standardized.	Training need procedure for individual employee / contract employee need to be established. Targets for the training duration for all the employees shall be prepared and monitored. The statutory requirements

			like requirement of Factory act, CEA regulations, outcome of various programs shall be considered for developing TNI. Training for the HODs, critical positions like safety head, plant HOD's shall be defined.
			Behaviour aspect training shall be part of top to bottom.
46.	Safety Observation system	Safety observation rounds are carried out.	It is recommended to conduct safety rounds with specific requirements like PTW noncompliance, noncompliance to licence area conditions, etc…
47.	Scaffolding management	Scaffolding are found erected through at various locations. Some are found to be prepared since long and the same has been to be used as platforms in plant area. The platform plates are found tied using wires.	A procedure for the checking, inspection, validation and time frame for with scaffolding are to be kept in the area, keeping escape routes free, etc. shall be part of the SOP prepared. Also inspection of scaffold material, clamps, platform clamps shall be part of SOP.
48.	On road	At many locations the drain water channel covers are found damaged or missing	The damaged / Missing covers shall be replaced.
49.	On road	Storm water channels were found blocked causing water logging at many places	As a pre monsoon process all the storm water channels shall be cleaned.
50.	CPP	EOT crane installed is having valid Form-10. No SOP available to what is to be checked and what test are to be carried out for critical cranes.	For critical lifting equipment like EOT crane, it is recommended to have SOP for checking all the limit switch operations, Brake (Slip) checking, Deflection test and hook integrity checking frequency.
51.	CPP	It is found that the confined space permit is approved by the plant in charge. It is not authorized by the competent	The permit procedure is required to be reviewed and revamped. Confined space atmosphere and isolation

		person. Also matrix for checking the gas and atmosphere inside the confined space is not evident.	shall be checked as per the matrix and in compliance to the requirement of section 36 of 'The Factory Act'.
52.	CPP	It was found that while hot work activity in plant the Fire extinguishers are being taken from the site locations. One such fire extinguisher was found taken and was not placed back to its location after completion of job.	Exclusive fire extinguishers shall be provided during hot work instead of removing the extinguisher from its location. SOP for the hot work and contract documents shall be reviewed and amended accordingly.
53.	CPP	One Temporary electric distribution supply board was found lying in the cooling tower area. The board was placed in open area exposed to rain water. The ELCB of the board was not operational. (permit no. 228394)	A robust SOP shall be prepared for inspection of temporary supply. Design of the temporary distribution board shall be reviewed by providing weather shed.
54.	CPP	The eye wash shower placed in the cooling tower area was found damaged but the same is not highlighted in SOA round or inspection rounds.	Specific inspection of emergency equipment shall be conducted and any damaged, missing or obstructed equipment shall be tagged and replaced/ repaired.
55.	CPP	Assembly point near nitrogen plant (utility) has not approach not having space to assemble.	Assembly points shall be reviewed for assess ability and space for assembling in case of emergency.
56.	CPP	The gate of Nitrogen plant (Licence premises was found open and not restriction to unauthorized entry. The same is applicable at almost all the License premises - PESO. The required Caution display are not provided in the license premises.	The entry in the license premises shall be restricted. The PESO approved license premises shall have required caution display boards. The area shall be kept under lock and key with defined responsibility.
57.	CPP	The chain driven conveyors are having its chain exposed at inner side.	Chain shall be provide 360 degree machine guarding.
58.	Substations and switch yard	There is no Electrical safety officer (ESO) designated as per the requirement of CEA regulation. The forms required to be filled by ESO are not evident. CEA regulation is not considered in the legal matrix of the organization.	ESO shall be designated as per CEA regulation. The Legal matrix shall be revised and reviewed for including the requirements of CEA regulations.

59.	Substations and switch yard	Single line diagram, rescue rod , Ambu bag are not provided in switch yard panel room.	SLD, Rescue rod and Ambu bag shall be ensured in the panel room.
60.	Substations and switch yard	The discharge and Earthing procedure is known to operator but the same is not documented.	Bus Discharge and Earthing procedure shall be documented and communicated to all.
61.	Substations and switch yard	While inspecting the insulated hand gloves used in electrical work out of three gloves checked all were found having manufacturing date beyond one year (2019/ 2021)	The hand gloves used in electrical work shall not be used beyond its expiry date. Procedure for discarding the expired hand gloves shall be in place.
62.	Substations and switch yard	The gate of switch yard (66KV) were found open and contractor employee were found inside the switch yard and its panel room (scaffolding & Housekeeping work). Also fence of switch yard is found damaged at many locations. No provision of danger notice at switch yard fence/ gate / panel room.	Entry in electric panel room shall be restricted and only authorized person shall be allowed to entry in the restricted area. Provision of danger notice as per relevant IS shall be provide at panel room and switch yard. Damaged fence shall be repaired.
63.	Substations and switch yard	out of two Fire extinguisher inside the panel room, one was placed on floor and approach of other extinguisher was blocked by the material placed.	Approach to fire extinguisher shall be kept clear. Fire extinguishers shall be mounted on wall as required in GFR.
64.	Substations and switch yard	Electrical Isolation permit is not as per the relevant Indian standard. It is part of the general work permit.	Isolation permit shall be separated and format shall be prepared as per the relevant IS.
65.	Substations and switch yard	Bus coupler panel is not provided with distinct colour.	Bus coupler panel shall be provided with distinct colour.
66.	Substations and switch yard	Fire suppression system is not provided in the panel.	fire suppression system shall be provided in the electric panel.
67.	Chlorine Tonner filling station	Tonners are lifted using the hook of two legged chain sling.	Appropriate lifting clamps shall be used for lifting chlorine tonners. Lifting using tip of the hook may result in damage to hook.

68.	Chlorine Tonner filling station	The Airline respirator and BA set are available in the premises and may get exposed to gas in case of gas leakage.	Risk assessment shall be conducted and based on outcome the location of the BA set and Airline respirator shall be reviewed.
69.	Chlorine Tonner filling station	Seating arrangement of operators is found just besides the chlorine tonners stacked in three layered.	The sitting arrangement shall be relocated. The stacking height of the tonner shall be reviewed as per the Gas cylinder rules.
70.	Chlorine Tonner filling station	In case of heavy leakage the use neutralizing pit is not clear to all working in the area.	SOP for emergency handling shall be displayed in the area.
71.	Permit 276410, Near V919	The hot work was in progress at height. Spatter were falling on the floor. Fire extinguisher was not available at site. The safety harness being used was having its clamps in damage condition. The seal of shock absorber was damaged. Tool box talk was not evident. Plastic material was not cleared from the area below. All thing were marked clear in the permit.	Review the permit format. Awareness on permit management needs to be improved for the permit issuer and acceptor. Procedure for inspecting the PPE used by contractor shall be prepared and implemented.
72.	Fork lift management	One fork lift GJ 16 BS1380 was found with registration number place of two distinct colours - Black and yellow in front and black and white on rear. SWL was not displayed on the fork lift. The spark arrestor provided on the silencer is not checked for its integrity. seat belt was found in damaged condition.	inspection procedure for the forklift shall be strengthened. A check list shall be used for fork lift inspection to fix accountability.
73.	Central Lab	Gas cylinders are found placed outside the Lab without proper securing and no warning sign or MSDS is displayed in the area. No means of unauthorized entry in the manifold area.	Gas cylinder manifold area shall be provided with appropriate warning signs, Display of Do's and Don'ts, handling procedure and restricted entry shall be provided. MSDS shall be displayed in the area.

74.	Central Lab	Fumes cup board inside the lab are found with damaged door. The air velocity checking for fume hood is not in place.	Fume cup board shall be providing with proper door. The fume extractors air velocity shall be checked and recorded.
75.	Central Lab	PPE matrix is not available for handling chemicals - use of respiratory PPE and hand gloves and face shield.	PPE matrix shall be displayed.
76.	Central Lab	Person working in Lab is unaware about the emergency procedure in case of fire.	Person shall be made aware about the emergency procedures to be followed in their area.
77.	Central Lab	Procedure for disposal of hazardous waste generated in the lab is not known to person working in Lab.	Person working in the lab shall be made aware about the waste disposal procedure.
78.	Central Lab	Provision of ELCB is not evident for the equipment used in Lab.	Provision of earth leakage protection device shall be made in the circuit.
79.	Sulphuric Acid storage area & HCL storage area (T3101 tank & T4222D)	Standard Danger notice is not evident in tank farm for sulphuric acid.	Standards danger notice shall be displayed in the acid storage area (refer GFR).
80.	Sulphuric Acid storage area & HCL storage area (T3101 tank & T4222D)	The vent pipe/ over flow pipe of the tanks are not diverted through scrubbers. The length of pipe is not appropriate. The acid proof tiling is not evident on the foundation of the tanks.	The vent pipe of the tank shall be diverted to scrubber. Pipe of appropriate length to avoid splashing shall be ensured at vents and over flow. Acid proof layer shall be ensured on the top portion of tank foundation.
81.	Sulphuric Acid storage area & HCL storage area (T3101 tank & T4222D)	The capacity to the dyke and dyke design to handle the spillage from tanks is not appropriate.	The dyke capacity and dyke wall distance shall be reviewed and revised to handle leakage in acid tank.
82.	Sulphuric Acid storage area & HCL storage area (T3101 tank & T4222D)	The pumps in the area has missing coupling guards.	A survey of coupling guard shall be conducted and missing guards shall be provided.

83.	Sulphuric Acid storage area & HCL storage area (T3101 tank & T4222D)	Flange guard are found missing on many flanges in acid line	Flange guard shall be ensure on all the flanges of the acid line.
84.	MDC filling area	It is found that the sitting arrangement for truck driver is not available. Key are placed in operator cabin and driver of one of the truck was not found in the vicinity.	The sitting arrangement / location for the truck drivers shall be fixed. The key location shall be so provide that it can be access immediately in case of emergency situation.
85.	MDC filling area	TREM card is not provide for the chemical filled and transported from the site.	TREM card shall be prepared for the chemicals transported from site. It shall be given to the driver of the vehicle through with the chemical is transported.
86.	MDC filling area	The area is not provided with Do's and Don'ts, loading and unloading procedure.	Proper display of Do's and Don'ts and loading & Unloading procedure shall be provided.
87.	MDC filling area	Drums are found placed on road without proper barrication, no MSDS, NO spill control arrangement.	Chemical drums (filled) shall be stored at its designated location with proper hazard warning and spill control management.
88.	CMS1	It is found that the hazardous waste is placed on road outside its storage area.	Hazardous waste and scrap material shall be stored at its designated location.
89.	On road	One hydra (GJ 16 BS2404) is having form 10 for vehicle but slings along with the hydra are not having form 10	No lifting tools and tackles of contractor, without form 10 shall be allowed inside the site.
90.	Filling station - R 125)	Three tankers were placed inside the premise. The connected hose has no identification. Display of Do's and Don'ts and loading & Unloading procedure not evident in the area. The drain point is not having blind.	The SOP for tanker loading unloading shall be prepared and displayed. Number of tankers to be placed inside the premises shall be marked. Hose management procedure shall be prepared for its life, tagging and compatibility.
91.	Canteen	Deep cleaning of canteen was in progress at the time of food preparation.	Deep cleaning of the canteen area is to be carried out after the food preparation is over.

92.	Canteen	Roti are going on floor from roti maker.	Roti collection vessel at roti maker machine needs to be reviewed.
93.	Canteen	Fly catcher machine were found not operational in the food preparation area.	Fly catcher machine shall be kept connected and ensured in ON condition in kitchen area.
94.	Canteen	Semi cooked food was insufficiently covered.	Proper covering shall be ensured on cooked and semi cooked food.
95.	Canteen	ELCB not available in the electrical equipments and gas valves with lot of dust.	ELCB shall be provide in the circuit. Gas valves shall be cleaned for easy operation.
96.	Canteen	Dish are manually washed and no SOP for dish cleaning.	Procedure shall be prepared for washing Dish.
97.	Canteen	Hygiene survey of canteen is not evident.	Hygiene survey shall be carried out for the canteen and hygiene audit of canteen and its staff shall be conducted at periodic interval.
98.	HR	TNI, Roles and responsivities and duties of the key position, Notification for SO, ESO, Welfare officer and Factory manager is not evident.	TNI shall be defined for each employee and its monitoring mechanic shall be developed. Roles, responsibilities and duties and notification letter for SO,ESO, Welfare officer and factory manager shall be kept easily accessible.
99.	Medical examination	Medical examination test for the employees shall be defined based on their job.	The medical test for drivers and food handlers, height worker shall have specific test to be defined
100.	Safety Observation system	Safety observation system needs to be strengthened	Safety observation rounds shall be schedule for specific inspection also.
101.	Training and awareness	Awareness on emergency preparedness, permit to work system, Chemical safety, Legal matrix needs to be improved.	Systematic plan of Training needs are to be identified and plan to cover all the concerned employees shall be prepared and implemented.
102.	General	PPEs matrix not found.	PPEs Matrix should be decided related to all plants/operations & boards should be displayed in each plant area.

103.	General	Emergency awareness found poor among employees.	Emergency scenarios & required actions should be discussed in plant with all employees & refresher trainings should be provided. Emergency siren coding boards should be displayed in each plant area & ensure audibility of siren in each plant. All assembly points should be given identification number & also same to be marked on emergency evacuation plan. Well-equipped emergency control centre should be established.
104.	Permit to work system	Work permits found in one format for all type of work & makes difficult/erratic selection of Applicability of Criteria's for different type of work. Risk assessment also found poor & less hazards considered.	Work permit system should be strengthened & criteria for each work should be separated/listed. All type of hazards/risks should be considered for risk assessment before starting any job. The work environment should be monitored by competent person for confined space entry as well as hot work jobs.
105.	House keeping	Overall poor housekeeping observed in plant area.	5's System should be implemented & Scrap management should be improved.
106.	Traffic management	Overall Road safety found poor. Vehicle movement & parking of cranes/trucks/tankers found on road causing road block.	Traffic management plan should be prepared & implemented.
107.	Fire System	Fire alarm monitoring system found in fire dept. Office.	Toxic gas monitoring system should also be integrated along with the fire alarm system.
108.	Structural Stability	As the factory is situated near seashore and humid environment, corrosion rate will be higher. Corrosion observed on structure in plant area.	Structural integrity survey should carried out frequently as plant also hands corrosive chemicals.

109.	On road	Spill contingency plan is not evident to control spills and leaks of the chemical drums stored on road.	A plan should be developed prior to every operation for handling spills of all components with regard to compatibility and disposal of associated waste utilizing Reactive Chemicals data.
110.	Emergency preparedness	ERT members list shall be displayed at main gate.	ERT members list should be displayed at main gate with their contact no's & availability in factory.
111.	CMS -1 & CMS-2 Plants, Control room	'Trouble' Fault observed on fire alarm panel.	It should be rectified.
112.	CMS -1 & CMS-2 Plants, Control room	No checklist found in first aid box & list of first aider present in shift.	First aider lists should be displayed & Checklist of first aid box items should be kept & filled on monthly basis.
113.	CMS -1 & CMS-2 Plants, Control room	Trip-Bypass register found prepared & maintained.	Reason for bypass should be mentioned. After attending it, what action taken should be recorded together with dates & by whom. List of interlocks should be maintained in control room with status (Active or Not).
114.	CMS -1 & CMS-2 Plants, Control room	SOPs found well prepared & documented.	SOPs should be updated to include emergency scenario in concern section & actions should be taken in specific manner in sequence in detail indicating equipment/valve with tag no's. Table-top exercise should be done for each emergency scenario for increasing awareness & immediate action.
115.	CMS -1 & CMS-2 Plants	NO PPEs matrix & emergency siren coding board found displayed.	Both should be displayed.
116.	CMS -1 & CMS-2 Plants	Poor Housekeeping observed.	Housekeeping should be improved.
117.	CMS -1 & CMS-2 Plants	V-2205 tube bundle found being boxed up. Cold work permit No.273976, dated 07/07/23 found issued. Only	This job also includes fall, trip, hook failure, strike to, uneven flooring hazards & should be considered

		'Cut' hazard found considered in risk assessment before doing job.	during risk assessment & appropriate control measures should be taken/mentioned. .
118.	CMS -1 & CMS-2 Plants	Contractor staff found sitting in chloroform tanker unloading area along with one argon cylinder kept on simple trolley. No work found in progress. New chloroform dryer line connection work was planned in CMS-2 Plant.	Contractor safety management system should be developed & implemented. Their working area & hazards must be informed them before giving any job.
119.	CMS -1 & CMS-2 Plants	Chloroform dyke area drain valve found closed but no drain pit found.	Drain pit should be made & connected with ETP.
120.	CA (Caustic Alkalies), Control room	"CPU failure' Fault observed on fire alarm panel.	It should be rectified.
121.	CA (Caustic Alkalies)	SOPs found well prepared & documented.	SOPs should be updated to include emergency scenario of hydrogen leakage on main hydrogen header in plant area. & actions should be taken in specific manner in sequence in detail indicating equipment/valve with tag no's. Table-top exercise should be done for each emergency scenario for increasing awareness & immediate action.
122.	CA (Caustic Alkalies) Plant area	No pipeline colour coding board found displayed in plant area.	Pipeline colour coding board should be displayed in plant area & strictly followed.
123.	ETP	No acid proof tiles found on flooring of dyke area of acid storage tanks.	Acid proof tiles should be provided.
124.	ETP	No fume absorber found on HCL storage tank.	Acid fume absorber should be provided.
125.	ETP	Electrical Earthing found on fan cover of motor for caustic feed pumps.	Electrical Earthing should be provided on motor body.
126.	CU (Common Utilities)	No smoke detectors found installed in MCC room.	Smoke detectors should be installed & linked with fire alarm panel.

127.	TFE-1 & R-125 Plant, NG station	NG station inlet header vent valve found closed but end flange not blinded.	Blind should be provided to prevent leakage of NG in case of minor passing of Valve.
128.	TFE-1 & R-125 Plant, NG station	NG station PCV-8301 downstream strainer flange jumper found in damaged condition.	Jumper should be attended & periodic testing should be carried out.
129.	TFE-1 & R-125 Plant, Control room	"CPU failure' Fault observed on fire alarm panel.	It should be rectified.
130.	TFE-1 & R-125 Plant, Control room	Emergency scenario ERP-S7 - Leakage of R-22/TFE from tower T-604 identified & one cause for leakage is Condenser top vent valve FCV-6013 failure.	The cause should be written clearly i.e. failure of valve itself & leaking or stuck close can lead to over pressurization of tower. Corrective actions to be taken during this emergency should be mentioned in details specifically in ERP for all causes leading leakage of TFE from tower. HFP leakage from tonner in storage shed should be considered & corrective actions should be mentioned in ERP/SOP.
131.	TFE-1 & R-125 Plant, Control room	Trip-Bypass register found prepared & maintained.	After attending it, what action taken should be recorded together with dates & by whom.
132.	TFE-1 & R-125 Plant	HFP full cylinders found kept upright without chain support & stand. HFP tonners found kept/lying on floor.	Gas cylinders should be stored with proper chain support & stand. Full & empty cylinders should be stored separately with display boards. HFP cylinders should be stored on roller support to hold securely in place & resist corrosion.
133.	TFE-1 & R-125 Plant	E-608 Dehydrator tube side leakage observed & was being attended.	Process incident should be studied in detail as per PSM needs. PSM should be implemented. MOC should be reviewed from mechanical integrity point of view.
134.	PVDF Plant	27G0101 Diaphragm type compressor motor Earthing found fan cover.	Earthing should be provided on motor body.

135.	APTFE / DTPFE plants	GI-5023 near monomer metering tank V-502J found faulty.	It should be rectified.
136.	APTFE & DTPFE plants	DI water storage tank V-5102H high level interlock found with XV to fill/make up the tank.	80% level indication should be considered for normal make up & closing XV. 85% level indication for high level alarm if XV fails to close.
137.	DTPFE Plant	No display emergency siren coding & audibility of emergency siren.	Both should be implemented & ensured.

4: OBJECTIVES, SCOPE AND METHODOLOGY

OBJECTIVES

The overall objectives of the Safety Audit are as under:

- To carry out a systematic critical appraisal of all potential hazards Involving personal, plant, services and operation method.
- To evaluate work practices and procedure followed in the plant and their effectiveness.
- To ensure that OS&H system fully satisfy the legal requirements and those of the Company's written safety policies, objectives and Progress.
- To examine and evaluate accident investigation & prevention.
- To examine safety management and accountability systems
- To carry out a systematic, critical appraisal of all potential hazards involving personnel, plant, services and operation method; and
- To ensure that OH & S system fully satisfies the legal requirements and those of the company's written safety policies, objectives and program.

AUDIT GOALS

Audits are normally designed to achieve one or more of the following goals:

- To provide the auditee with an opportunity to assess its own OH & S system against a OH & S system standard and identify areas for improvement;
- To determine the conformity of the implemented OH & S system with specified requirements and identify areas for improvement; and
- To meet regulatory requirements.
- To increase Health, Safety and Environmental awareness.
- Enhance Company image

SCOPE

The scope of the safety audit was limited to the safety and health of workers employed in the manufacturing processes and operations and also the safety of the plant and equipment used in the factory. A few aspects of environmental management systems were also audited.

"Management Systems" audit was done to assess the management's involvement and commitment towards promoting safety and health system at work. Management system audit provided scope of examining and evaluation of safety policies and procedures and their review, hazard communication system, dissemination of information and hazard awareness programme, training and motivation of employees, etc.

Besides management systems audit, technical aspects of plant activities namely, storage and handling of hazardous substances, process and operational safety review, transportation safety, testing and examination of plant and equipment, housekeeping, waste disposal system, fire protection and control, etc. were also audited.

The following elements of management systems and technical aspects were audited:

1. Health and Safety policy
2. Safety Organization and functions
3. Safety Committee
4. Safety Budget
5. Accident Reporting, Investigation and Analysis
6. Safety Inspection
7. Safety Education and Training
8. Safety Communication/Motivation/Promotion
9. First Aid
10. First Aid Centre (Occupational Health Centre)
11. House Keeping
12. Noise
13. Ventilation
14. Illumination
15. Hazard Identification and Control
16. Fire Protection and Control System
17. Personal Protective Equipment
18. Waste Disposal system
19. Emergency Preparedness
20. Material Safety Data Sheet (MSDS)
21. Safe Operating Procedure (SOP)
22. Work Permit System
23. Plant Layout and Area Classification
24. Static Electricity
25. Pressure Vessels (Fired & Unfired)
26. New Equipment Review
27. Lifting Machines and Tackles
28. Maintenance systems
29. Tank Storage Vessel Area
30. Transportation Hazard
31. Statutory Compliance

METHODOLOGY

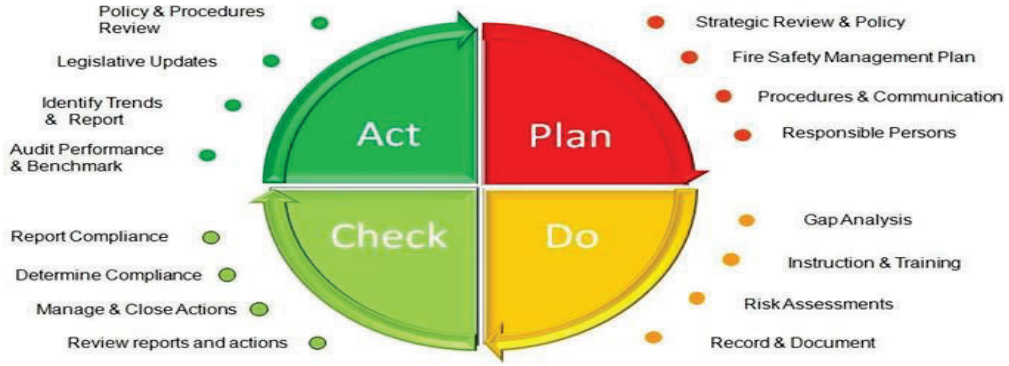
Methodologies applied for conducting safety audit were as follows:

i) Preliminary information was collected from the factory during pre-audit survey in respect of its employment, production process and target, storage system and capacity of hazardous material storage, safety engineering and management, features of the plants and processes, emergency and disaster management plant and processes, emergency and disaster management plan etc. A set of questionnaires specifically designed for the factory was used for collection of information during the audit.



ii) An opening meeting was held with the senior management personnel of the plant by VEPL Team to get familiarized with the plants and processes and the built-in safety redundancy systems available in different plants; and also to appraise safety philosophy of the management in terms of accident prevention programme and disaster control plan. The audit team also informed the management personnel regarding the scope and objectives of the audit and methodologies that will be followed.

iii) The audit team made site inspections to different plants with critical observations in respect of safety and occupational health to identify and assess hazard potential in the plants. Deviations from safe working conditions and practices and defects in the plants and equipment observed during such visit were analyzed and documented for their corrective actions.



iv) All documents pertaining to the safety and health system namely the accident intimation register, accident register, accident investigation report, safety equipment register, inventory of firefighting and their inspection and maintenance schedule, inspection and maintenance of plant record, training of personnel etc. were perused by the audit team.

v) Deficiencies observed in the plants and processes and health and safety systems were discussed with the management at the end of the audit.

vi) Finally, a report was made on the basis of the information collected and observations made during the audit.

STANDARDS

The audit was conducted with the following standards and codes of practices on safety and occupational health:

i) Indian Standard on Codes of practices for Occupational Safety & Health Auditing (IS 14489:1998)

ii) Statutory requirements (Factories Act, Explosive Act, other related Acts & Rules made there under.

iii) Codes of practices prepared by National and International Organizations (e.g. BIS, ICMA, NSC, LPA, etc.)

iv) Current Safe Practices, Prevalent in the factory.

AUDIT FREQUENCY

The need to perform an audit is determined by the client, taking into account specified or regulatory requirements and any other pertinent factors. Significant changes in management, organization, policy, techniques or technologies, and products that could affect the OH & S system, or changes to the system itself and the results of recent previous audits, are typical of the circumstances to be considered when deciding audit frequency. It is desirable that organizations have a combination of external and internal OH & S audit system. While the external audit in respect of organizations may be conducted once in two years, or as specified by any statute, the frequency of internal audit may be set once in every year. Records of accidents and dangerous occurrences should be examined and used to identify high-risk areas and activities and consequently the frequency of internal audit may be increased.

ACTION FOR IMPLEMENTATION OF OH & S AUDIT REPORT

The auditee is responsible for determining and initiating corrective action on audit recommendations. The auditee should prepare an action plan for implementation of audit report; specifying action by concerned departments and time limits for completion. This may be in consultation with the auditing organization or client. The time limit for completion may be decided considering the importance and safety implications of the recommendation.

One of the most important follow-up actions is the communication of the content of the audit report to appropriate personnel in the auditee organization. The agreed recommendations for action with target dates for implementation of the recommendations should also be conveyed to implementing agency. Where no action is proposed to be taken (although it may have been recommended in the course of the audit) the reasons for this decision should be documented. If it is not feasible to implement some of the recommendations of the audit team, then the auditee should inform about such recommendations to the client specifying reasons. This information may also be conveyed to the auditor.

The auditee should develop a monitoring system for implementation of the recommendations and periodically assess the implementation status of the audit report. If needed a follow-up audit can be conducted to review implementation of the audit recommendations.

5: APPLICABLE LAWS AND STATUTORY COMPLIANCE

All activities are to be subjected to the present safety audit. For this inspection was carried out and this was also aimed to promote contact with the individual workers. This helped to achieve the company's interest and concerns, to gain worker involvement, to encourage comments and suggestions relating to safety and to invite co-operation in discovering conditions which need correction so that the company's safety standards are in line with that of approved safety standards. Based on the above criteria and discussion, the scope of safety audit was limited as given below:

Looking to the above chemicals, their storage quantity & process parameters, applicability of some safety laws is discussed below: -

Applicable Laws & Statutory Compliance

Sr No.	Work Area/ Document/Title	Statutory Requirement as per	Observation	Recommendation
1.	Occupier	Section 2 (n) of the Factories Act (FA)	Mr. Sanath Kumar	-
2.	Factory Manager	Section 2 (n) of the Factories Act (FA)	Dr. Sunil Bhatt	-
3.	Factory License No.	Under Section-6 of FA.	Licence No: 15074 Valid up to 31st December 2025	-
4.	Approval of Plan.	Under the Sub-Section (1) of Section-6 and Rule-3, 3(A) and 3(B) of GFR.	Approved.	-
5.	Stability Certificate in Form no 1-A.	Under the Sub-Section (1) of Section 6 and Rule-3 (C) of GFR	Available.	-
6.	Work Place Monitoring.	Under the Section 7-A (a) (e) & Rule 12-B of GFR.	Form No. 37 Maintained. Carried out by Third Party.	-
7.	Pollution Control.	Under the Water Act-1974 & Air Act 1981 and Solid Waste. Management 1986	GPCB consent order No. CCA : AWH-118244 Valid up to: 15/02/2027	-
8.	Dust & Fumes	Section 14 of the Factories Act (FA)	Scrubber Systems is provided.	-

9.	Cleanliness	Section 11 of FA 1948	Housekeeping maintained.	-
10.	Ventilation & Temperature	Section 13 of FA 1948	Effective measures are taken	-
11.	Overcrowding	Section 16 of FA 1948	No room found overcrowded.	-
12.	Lighting	Section 17 of FA 1948	Proper lighting found in work area.	-
13.	Drinking water	Section 18 of FA 1948	Water quality checked regularly & Records are maintained.	
14.	Fencing of machinery	Section 21 of FA 1948	Maintained properly	-
15.	Centrifuge.	Section 23 of FA 1948 & Under the Rule-54, Schedule-V of GFR.	Not Available.	
16.	Hoist & Lifts.	Under the Section-28 & Rule-58 of the GFR.	Test date & Safe load marking done at all places.	
17.	Lifting Tackles and Lifting Machines.	Under the Section-29 of FA & Rule-60 of GFR.	Test date & Safe load marking done at all places.	
18.	Pressure Vessels and Gas Holder.	Under the Section 31 of FA & Rule 61, 61 A of GFR.	Tested & records are maintained.	-
19.	Floors, Stairs & Means of Access	Section 32 of FA 1948	Maintained properly	-
20.	Pits, Sumps, Openings in floors	Section 33 of FA 1948	Storm water channels are covered to prevent entry of spilled chemicals.	-
21.	Protection of eyes	Section 35 of FA 1948	Periodical Inspection & record are maintained	-
22.	Precautions against Dangerous fumes and gases etc.	Section 36 of FA 1948	Dust Masks are made available. Work Permit system is there.	-

23.	Precautions regarding use of portable light	Section 36 (A) of FA 1948	Electrical equipment's are provided with ELCB.	-
24.	Explosive & inflammable Dust, Gas etc.	Section 37 of FA 1948	Effective enclosure & safe venting system are installed.	-
25.	Lighting Arrestor.	Section 37 of the Factories Act 1948.	Available.	-
26.	Earthing for Static Electricity.	Section 37 of the Factories Act 1948.	Provided.	-
27.	Safety of Building & Machineries	Section 40 of FA 1948	Maintained.	-
28.	Maintenance of Buildings	Section 40 (A) of FA 1948	Stability Certificate Available.	-
29.	Appointment of Safety Officers	Section 40 (B) of FA 1948	Safety department is available at site with 10 Nos of Qualified safety professional.	-
30.	Personal Protective Equipment.	Section 41 of FA 1948 & Under the Rule 68B & Schedule XIX of Rule-102 of GFR 1963.	Provided.	-
31.	Thermic fluid heater.	Section 41 of FA 1948, Under the Rule- 68D of GFR.	Tested & records are maintained.	-
32.	Driers & Ovens.	Section 41 of FA 1948, Under the Rule -68G of GFR.	N/A	-
33.	Wind Indicator.	Section 41 of FA 1948, Under the Rule -68J of GFR.	Provided.	-
34.	Compulsory Disclosure of information by occupier	Section 41-B of FA 1948	It is in line with requirements.	-

35.	Accident/Incident & Occupational Disease Record.	Under the Section 88, 88-A & 89 of the FA 1948.	Well Maintained.	-
36.	Onsite/Offsite emergency plan.	Under the Section 41-B & Rule 68-J (12) of GFR. & Rule-13 of MSIHC Rule 1989.	Prepared.	-
37.	Onsite Emergency Plan Mock Drill.	Under the Section 41-B & Rule 68-J (12) of GFR & Rule-13 of MSIHC Rule 1989.	Mock drill Conducted & Record is maintained.	On-site plan to be review once in a year.
38.	Safety Report.	Under the Rule 68-J (9) of GFR & Rule 10 of MSIHC Rule 1989	Safety report is prepared as per schedule 8 of the law.	
39.	Standard Operating Procedure.	Under the Section-41 (B) (7)	Prepared & available.	It Shall be made available at plant area offices.
40.	Safety Manual.	Under the Rule 41 (B)	Available.	
41.	Health & Safety Policy.	Under the Section 41-B & Rule 12-C / Rule 68-O of the GFR.	Prepared & displayed.	-
42.	Safety Committee.	Under the Section-41 (G) and Rule 68 (F&Y) of GFR	Safety committee formed. Quarterly meeting conducted	-
43.	Specific responsibility of occupier in relation to hazardous process	Section 41-C of FA 1948	It is in line with requirements.	-
44.	Periodic medical examination to prevent occupational diseases.	Section 41-C of FA 1948 & Under the Rule 68 T & 102 of GFR 1963.	Form no 32 & 33 maintain regularly Conducted & Records are maintained.	-
45.	Emergency Standards	Section 41-E of FA 1948	OSEP Prepared. ECR (ECC) developed.	-
46.	Workers Participation in Safety Management	Section 41-G of FA 1948	Safety Committee consists of workers representative &	-

			management representatives.	
47.	Safety Audit/Risk Assessment / Hazop Study.	Under the Rule 12-C/Rule 68-O of GFR & Under MSIHC Rules 2000, Rule 10.	Conducted and records were checked during the visit.	
48.	Public Liability Insurance.	Under the Public Liability Insurance Act 1991	Available.	-
49.	Storage of petroleum products & Explosives	Under the Explosive Act & Rules.	License No. S/HO/GJ/03/1778 (S73093) Storage valid up to 30/09/2025	--
50.	Boilers	Under the Boilers Act & Rules.	05 (Hydrogen Boiler, HRSG-2, AFBC-2)	-
51.	Food & Drug License.	Under the Food & Drug Act & the Food Safety & Standard Act for Solid Sulphur Storage	Not applicable	-
52.	Poison License.	Under the Poison License Act, 1919	NA	-
53.	NOC of DG. Set.	Under Electricity Act.	02 DG (1010 + 500 KVA)	-
54.	Ambulance Van.	Under the Rule 68-V of GFR 1963.	Mutual Agreement with Nearby Hospital	-
55.	Transportation of hazardous material.	Under the Motor Vehicle Act.	Rented vehicles.	-
56.	Workman Compensation detail.	Under the Workman Compensation Act.	Insured with insurance company.	-

6: IS: 14489-1998 – SAFETY AUDIT QUESTIONNAIRE

C-1 OH & S MANAGEMENT

C-1.1 OH & S Policy

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Does the organization have OH & S policy?	YES	Prepared as per the factory act requirement and it is available.	YES	Complied.
b	Who has signed the OH & S policy?	YES	OH & S policy is signed by CEO	YES	Complied.
c	Whether the OH & S policy is per guidelines of the statutory provisions?	YES	Yes, It is prepared as per factory act 1948	YES	The OSH policy is prepared as per GFR guidelines.
d	When was the OH & S policy declared and adopted?	YES	OH & S policy declared and adopted on dated: 1st January 2022.	YES	Complied.
e	Whether the OH & S policy reviewed periodically?	YES	Yes, reviewed. Dated: 1st January 2022.	YES	Complied.

f	Whether the OH & S policy is available in local language and made known to all?	YES	Yes, it is only available in English language.	YES	Policy should be available in Hindi- Local Language.
g	What was the last date of updation?	YES	1st January 2022.	YES	Complied.
h	Does the policy find a place in the annual report?	Yes	Yes. Record is available.	Appreciable.	-

C-2 OH & S ORGANIZATIONAL SET UP

C- 2.1 Safety Department

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	AUDITEE REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Does the factory have a safety department and what is strength of safety department?	YES	Safety department is available at site with 10 Nos of Qualified safety professional.	YES	Complied.
b	Whether the strength and qualifications of Safety Officers are as per the statutes?	YES	Yes, As per the requirement of factory act	YES	Complied.
c	Does the head of safety department report to the Chief Executive?	YES	Yes, reporting to the CEO / Factory Manager	YES	Complied.

d	How often are the safety officers retrained in the latest techniques of total safety management? What is the frequency of retraining?	YES	As per requirements	YES	-
e	What additional duties the safety officer is required to do?	YES	No additional duties	Safety staff should concentrate mainly on safety duty.	There is no any additional duties done by safety officer
f	What is the power of safety officer vis-a-vis unsafe condition/unsafe act?	YES	To stop any dangerous operation. If there are any unsafe conditions or acts, these will be brought to the notice of the concerned HOD and in the case of imminent danger, the job stopped until unsafe conditions/ act were removed / corrected.	YES	Safety officer have power to stop any activity which is unsafe.

C-2.2 Safety Committee(s)

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Does the factory have a safety committee(s)? What are the types,	YES	Plant Safety Committee, Central Safety Committee	YES	Complied.

	structures and terms of reference of the committees				
b	Is the constitution of the safety committee(s) as per the statute?	YES		YES	Safety committees constituted As per Statutory compliance.
c	How are the members of safety committee(s) selected? (elected / nominated	YES	Nominated	YES	50-50% of management and worker side.
d	How often are the meetings of safety committee(s) held?	YES	PSC: Monthly, CSC: Quarterly	YES	MOM is circulated to committee members & records are maintained.
e	Are the recommendations of the committees(s) implemented?	YES	The recommendations were implemented by action plan by respective department In-charge.	YES	Complied.
f	Are the minutes of the safety committee(s) meetings circulated among the members?	YES	Minutes of safety committee's meetings circulated through e-mail	YES	Complied.
g	Are the minutes forwarded to the trade union(s) and chief executive and occupier?	YES		YES	Circulated & Records are maintained.
h	Whether the management and trade union play their active roles in supporting and accepting the committee(s) recommendations?	YES	Always	YES	

i	How are the safety committee(s) members apprised of the latest development in safety, health and environment?	YES	Yes Regular training and video presentation at every meeting	YES	Safety committee(s) members shall be apprised of the latest developments in safety, health & environment and also sent to other units to share the information & gain practical experience.

C-2.3 Safety Budget

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	What is the annual safety budget?	YES	As & when demands, provides approval for safety compliances	YES	Budget is provide based on the requirements for new and for AMC it is based on approval.
b	How much percentage is this budget of the total turnover of the company?	YES	As per Standard use to provided amount	YES	No such capacity decided.
c	How much budget has been utilized till date?	YES	As requirement.	YES	-
d	Is the safety budget adequate?	YES	Adequate.	YES	-
e	How is the safety budget arrived at?	YES	From past budgets.	YES	Based on activity planned.
f	What is the pattern of expenditure for the last five years?	YES	Data available at HSE department.		In increasing trend. Expenses including Training, PPEs,

					preventive maintenance of firefighting equipment, testing and examination expenses, inventory of emergency arrangements. Dedicated Cost controller reviews the trend/track on pattern of expenditure.
g	What are the approved sanctions for the expenditure in this budget?	YES	Expenses related to SHE	YES	-
h	Does this budget get reflected in the annual report of the company?	YES	As per Standard include the Annual report	YES	-

C-3 SAFETY MANUAL

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	What is the periodicity of updation / review of safety manual?	YES	As per requirement or Every three years	YES	Complied.
b	Does the safety manual adequately address all the hazards in the plant?	YES		YES	Complied.
c	Are the employee made aware of safety rules / instruction mentioned in the safety manual?	YES	Training given.	YES	Complied.

C-4 STANDARD OPERATING PROCEDURES (SOP)

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Are written Standard / safe operating procedures available for all operations and processes?	YES	Records Available at respective department	YES	Complied.
b	Whether the written Standard / safe operating procedures are displayed or made available and explained in the local language to the workers?	YES		YES	Display are provided at site.
c	Whether concerned section and safety department prepares standard / safe operating procedure jointly?	YES	Concerned section and safety department jointly prepared Procedure/SOP.	YES	Complied.
d	Are standard / safe operating procedures reviewed and updated?	YES		YES	Complied.
e	Have the workers been informed of the consequences of failure to observe the standard / safe operating procedures?	YES		YES	Complied.

C-5 PLANT MODIFICATION PROCEDURES

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	What is the system for effecting any change in the existing plant, equipment or process?	YES	MOC (Management of change) Procedure Available	YES	Complied.
b	Whether the P & I diagrams and other related documents are updated accordingly?	YES	P & ID updated, Records are available	YES	Complied.
c	Whether hazard assessment done before implementation of modification?	YES		YES	Complied.

C-6 WORK PERMIT SYSTEM

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	What types of work permits exist in the factory?	YES	Total 8 work permit available. Like- Hot work, Confined Space, working at Height work, Excavation & General Work		Isolation permit to be implemented properly.

b	Are the necessary forms detailing required safety precautions have been prepared and used for each type of work-permit?	YES	Work permit system in place for each type of work.		Each work permit considers their appropriate hazard.
c	Is the responsibility assigned to authorize person for issuing of safety work permit?	YES	Work Permit Authorization system available		Complied.
d	Is the copy of safe work permit sent to safety officer before execution of the job?	YES	Filing system followed	YES	Safety officer ensures that working condition is safe before execution.
e	Is validity period specified in the safety work permit?	YES	Mentioned in work permit also	YES	
f	Are the records of work permit available and maintained in proper order?	YES	Records available	YES	Work permit is maintained properly by yearly sequence number.

C- 6.1 Control Measures for Work at Height

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Is adequate safe access provided to all places where workers need to work?	YES		YES	Height work controlled by PTW.

b	Are all such access in good condition?	YES		YES	Complied.
c	Are all scaffolds are properly designed and erected?	YES			Complied.
d	Are scaffolds inspected every day before work begins?	YES	Visually inspected daily	YES	Complied.
e	Are ladders securely clamped or lashed in place?	YES		YES	Complied.
f	Are planks in good condition?	YES		YES	Complied.
g	Are scaffold walkaways, platforms, runs or stairs free of debris, grease, any unnecessary obstruction and projecting nails?	YES	Free from obstruction	YES	Complied.
h	Are the scaffolds higher than 20 m.? If yes, is a netting or intermediate railing provided between toe-boards and hand railings?	YES		YES	Verified.
i	Are folding stepladders properly used?	YES		YES	Complied.
j	Are ladders set up at the proper slope of about 1:4?	YES		YES	Complied.
k	Do workers use hand lines to lift tools or materials?	YES		YES	Complied.

l	Are proper ladders used around electrical hazards?	YES	Electrical ladder used	YES	Complied.
m	On sloping roofs, are crawling boards, lifelines, safety belts and edge protection provided where needed?	YES		YES	Complied.
n	Whether the weak spots, skylights, or deteriorated asbestos-cement boards through which a worker might fall while working in the roof has been identified and safety net provided appropriately?	NO	No any situation available in site	NO	Complied.
o	Are the workers being medically examined for their fitness to work at height?	YES	Medical examination done	YES	Complied.

C-6.2 Work in Confined Space

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Is work permit system followed for working in confined space?	YES	Confined space work permit in place and followed.	YES	Complied.

b	Whether monitoring of the atmosphere inside the confined space is carried out and ensured that there is no flammable or toxic gas in the area?	YES	Yes, O_2, LEL level & in confined space entry work permit	YES	Complied.
c	Whether the person entering the confined space is using suitable personal protective equipment (PPE)?	YES	All required PPEs are used during confined space work.	YES	Complied.
d	Is rescue team available in case of any emergency?	YES	In case of any emergency, team are available	YES	Complied.

C-7 CONTRACTORS' SAFETY SYSTEM

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Is there any system for selection of contractors?	YES	System available	YES	Procedure/SOP for contractor Safety Management prepared & implemented.
b	Are there any guidelines on contractor's safety and training?	YES	L1 training given by HSEF Team	YES	Procedure/SOP for contractor Safety Management prepared & implemented.

c	Whether contract document includes necessary safety and welfare clauses as per statutes?	YES	Yes Follow during pre qualification	YES	Procedure/SOP for contractor Safety Management prepared & implemented.
d	Is there any programme to ensure use of PPE by contractors personnel?	YES		YES	Procedure/SOP for contractor Safety Management prepared & implemented.
e	Do the contractors have their own safety organization?	YES	Contractor wise safety supervisor available	YES	Procedure/SOP for contractor Safety Management prepared & implemented.
f	Are the contractors reporting all accidents and injuries?	YES		YES	Procedure/SOP for contractor Safety Management prepared & implemented.
g	Are contractor workers trained to observe safety at work place?	YES	L2 Job specific Training given by	YES	Procedure/SOP for contractor Safety Management prepared & implemented.
h	Whether contractor workers are engaged in process / operations? If yes, are they aware of safe operating procedures?	YES	No, contractor workers were engaged in plant process & operation.	YES	Procedure/ SOP for contractor Safety Management prepared & implemented.

C-8 PLANT DESIGN AND LAYOUT

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Whether hazardous operations in the plant are segregated?	YES		YES	Complied.
b	Whether occupational health & safety aspects are considered during the design?	YES		YES	No such supportive document
c	Are all the equipment provided with adequate space for working, maintenance etc.?	YES		YES	At present material stored on road and ground floor causing obstruction. Keeping free access
d	Are the storage tanks provided with enough space/ clearance between them?	YES		YES	Complied.
e	Whether the plant layout has taken care of the movement of firefighting equipment and emergency exits?	YES		YES	Complied.

C-9 MEDICAL MANAGEMENT OF ACCIDENTS

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Are medical facilities available with trained first aid staff and equipment in round the clock shift for all including contractors?	YES	FMO in First and Second shift, Two male nurse and two ambulance drivers in each shift and one female nurse in general shift.	YES	Complied.
b	Is the ambulance van available for round the clock basis with the dedicated driver?	YES	02 ambulance available with drivers	YES	Complied.
c	Is there any mutual aid scheme available with the nearest hospitals to manage and treat injuries during emergency?	YES	Mutual aid scheme available	YES	Complied.
d	Are the workers / contractor workers aware of emergency medical facilities?	YES	Training available	YES	Complied.

C-10 MANAGEMENT OF EMERGENCIES (NATURAL / MAN-MADE)

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Does the system exist to detect and control these Emergencies?	YES	Emergency Response Plan is in place	YES	Periodical On-site emergency Action Plan awareness training to be done.
b	Are the employees aware of the measures to be taken during emergencies?	YES	The employee aware through Mock Drill & OSEP Training on regular basis.	YES	Verbal interview, Mock drill.

C-11 EMPLOYEES SELECTION AND PLACEMENT

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Whether norms are available for selection of different category of employees?	YES		YES	Job Description should be available with HR.
b	Whether pre-employment medical examination is being conducted for employees?	YES	Form No. 33 of all employee is available	YES	Complied.

c	Is there any procedure to evaluate safety awareness and record of the employees during their promotion?	YES		YES	Complied.

C-12 SAFETY CULTURE

C-12.1 Attitudes of Managers

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Do the managers follow the plant safety rules at all times?	YES		YES	Complied.
b	What are their attitudes towards safety reviews and audits?	YES	Positive attitudes towards safety review and audit	YES	Behavior Base Safety awareness training to be done for all the employees.
c	What is the response of management to safety violation?	YES	CSR Policy available	YES	Complied.
d	Whether safety related decisions are taken in consultation with the workers?	YES		YES	Complied.
e	What is the attitude of the managers towards non-use of personal protective equipment?	YES	They fully use Mandatory PEES	YES	

C-12.2 Attitudes of Workers

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Whether workers are aware of the consequences of their wrong actions?	YES	workers are aware of the consequences of their wrong actions and Violation.	YES	Complied.
b	Are laid down safe working procedures followed strictly?	YES	Training given to all workers.	YES	Complied.
c	What is the attitude of the workers towards their own mistake, which can prejudice safety?	YES	Safety observation tour data available.	YES	Appreciated.
d	Do the workers report near miss incidents and suggest safety improvements?	YES		YES	Complied.
e	Are the workers aware of the system of rewards and sanctions relating to safety matters?	YES		YES	Rewards and recognition during safety week.
f	What is the attitude of workers towards use of personal protective equipment?	YES	Positive attitudes towards use of personal protective equipment.	YES	Non-compliance to use of PPE was not observed during audit.

			All workers used personal protective equipment.		

C-13 STATUTORY LICENSES, APPROVALS AND RECORDS

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Whether all the safety related Acts / Rules (with latest amendments) applicable to your organization identified, informed to all employees and complied?	YES	Legal aspect register is prepared & responsibilities are identified.	YES	Training to be provided on safety rules and act.
b	Whether the licenses have been validated?	YES		YES	Verified all the licenses.

C-14 MOTIVATIONAL AND PROMOTIONAL MEASURES FOR OH & S

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Does the factory have occupational health and safety suggestion scheme?	YES	HSE department has prepared occupational health and safety suggestion scheme.	YES	Verified.
b	Are occupational health and safety contests organized in the factory?	YES	During safety month celebration	NSD 4th March celebrates & organized contests	NSD week to be celebrated with organized various contests & report to be submitted to DISH Office.
c	Does the factory participate in National Awards?	YES		YES	Complied.
d	Has the factory been awarded during last five years?	NO		NO	
e	Does the organization publish safety bulletin / newsletters?	YES	Published by mail	YES	Periodical Safety Bulletin /newsletters will increase the knowledge & awareness among employees
f	Whether the safety bulletins are widely distributed?	YES		YES	Periodical Safety Bulletin /newsletters to be widely distributed

g	How is the occupational health and safety information including accident statistics disseminated in the factory? (Bulletin boards, Newsletter etc.)	YES	Through Bulletin boards, Newsletter, Mail	YES	Occupational health and safety information including accident statistics disseminated in the factory at Main Gate & each plant
h	What are the activities conducted during National Safety day / week?	YES	External training, First aid training, Safety quiz, safety slogan quiz, safety poster quiz etc.	YES	Complied.
i	What is the percentage of Workers participating in the various safety promotional activities?	YES	Majority Workers participating in the various safety promotional activities.	YES	Complied.

C-15 HAZARD IDENTIFICATION AND JOB SAFETY ANALYSIS

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Was an initial process hazard analysis (PHA) completed?	YES		YES	Complied.
b	What are the stages of PHA? Whether a dedicated group is identified for PHA?	YES		YES	Complied.

c	Was the PHA appropriate for the complexity of the process and identify, evaluate, and control the hazards involved in the process?	YES	Records available	YES	Complied.
d	Does the hazard evaluation use one or more of the following PHA methodologies: What-If Analysis, Process Checklist, Hazard and Operability Study (HAZOP), Failure Mode and Effects Criticality Analysis (FMECA), Fault Tree Analysis (FTA) or any other appropriate equivalent methodology?	YES	Process Checklist, Hazard and Operability Study (HAZOP), for hazard evaluation	YES	Complied.
e	Does PHA assures addressing issues of inherent safety features with respect to material and their properties?	YES		YES	Complied.
f	Does the PHA address the hazard identify incidents history, consequences of failures (engineering and administrative controls), human factors, and consequent analysis with respect to	YES		YES	Complied.

	possible safety and health effects of failure of controls?				
g	What are the stages of PHA? Whether a dedicated group is identified for PHA?	YES	PT & PHA Subcommittee, PSM Subcommittee, PSM coordinators from each process plant.	YES	Complied.
h	Does the system exists to promptly address findings and recommendations of PHA?	YES	Tracking of data by PT&PHA Subcommittee	YES	Complied.
i	Are the PHA's updated and revalidated at least every five years by a qualified team to assure that the PHA is consistent with the current process?	YES	Last Completed by DSS and Small section HAZOP by Quality Engineering Services	YES	Complied.
j	Whether the activities requiring Job Safety Analysis have been identified?	YES	Initiated recently	YES	Verified.
k	Whether the identified jobs for Hazard Identification have been carried out by trained and experienced persons?	YES	Hazard Identification have been carried out by trained and experienced persons. Records are maintained.	YES	Complied.
l	Whether the checklists have been prepared on each Job Safety Analysis	YES	Records available	YES	Verified.

	and are being used while carrying out the job?				

C-16 PRODUCT SAFETY

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Whether hazards arising from use of the products are identified?	YES	Register is prepared for all activities and counter measures are provided.	YES	MSDS are available.
b	Whether material safety data sheet prepared for the products?	YES	MSDS is available with respective departments.	YES	-
c	Are all the products labeled and packed appropriately?	YES	products are labeled and packed appropriately.	YES	-
d	Whether safety instructions are given along with products?	YES	Safety instructions are given along with products.	YES	-
e	Whether policy exists for recall of products?	YES	-	YES	-

C-17 SAFETY TRAINING

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Whether training needs have been identified?	YES	Training calendar Excel based available for HSE training / at E&T department	YES	Training needs have been identified for each employees & implemented
b	Is there any programme of induction training, its duration and topics covered?	YES	Duration for induction training: 02 Hrs	YES	Induction training Should be provided to employees; Visitors & hazardous material transporting Drivers.
c	Whether the assessment of the trainees has been carried out?	YES	Records available	YES	Assessment of the trainees to be carried out by Question paper.
d	What are the infra-structural facilities available for training?	YES		YES	Dedicated Conference Room and training Hall available.
e	Whether training is conducted by qualified person?	YES		YES	
f	Whether trainers are being re-trained from time to time?	YES		YES	Train the trainers program to be conducted
g	Whether proper records of training program conducted are maintained?	YES			Verified.

h	How training programs are evaluated?	YES	By written and practical exam.	YES	Complied.
i	Whether schedule for training on occupational health and safety is available and maintained?	YES	Training calendar available.	YES	Verified.
j	Whether the training Programmes are reviewed?	YES	Training Programmes are reviewed on regular basis.	YES	Verified.
k	Are all the employees periodically trained / retrained and what is the frequency of such training?	YES	Yearly.	YES	Complied.
l	Are the retraining needs identified whenever a new process / products and change in existing process introduced?	YES	Training Programmes are reviewed on regular basis.		Procedure /SOP prepared for Safety Training need identification. & training frequency.
m	Whether training covers top management?	NO	-	NO	Top management to be provided with the training.
n	How many hours of safety training is given to different employees?	YES	About 3 man days internally conducted.	YES	Verified.

C-18 CHANGE MANAGEMENT

C-18.1 Management of Change

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Are there written procedures for managing change to process chemicals, technology, equipment and procedures and changes to facilities that affect the plant process / system operation?	YES		YES	Verified.
b	Do the procedures assure that the technical basis for the proposed change addressed prior to any change?	YES	They were ensured with technical team for the proposed change addressed prior to any change and maintained the record.	YES	Verified.
c	Do the procedures assure that the impact of the change on safety and health addressed prior to any change?	YES		YES	Complied.
d	Do the procedures assure that modifications to operating procedures are addressed prior to any change?	YES		YES	Complied.

e	Do the procedures assure that the necessary time period for the change is addressed prior to any change?	YES		YES	Complied.
f	Do the procedures assure that the authorization requirements for the proposed change are addressed prior to any change?	YES		YES	Complied.
g	Are employees involved in operating a process, and maintenance and contract employees whose job tasks will be affected by change informed of, and trained in, the change prior to the start-up of process or affected part of process / operations?	YES	Training given to operators for Process Change.	YES	Complied.
h	Is the safety information is reviewed and updated on changes?	YES		YES	Complied.
i	Are the operating procedures or practices updated?	YES	SOP updated	YES	Complied.

C-18.2 Mechanical Integrity

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Does the mechanical integrity program include for all mechanical equipment including pressure vessels and storage tanks, piping and components, relief devices and vent systems, emergency shutdown systems, pumps, control systems?	YES	MIQA committee	YES	Complied.
b	Are there written procedures to maintain the on- going integrity of process equipment?	YES	SOP available	YES	Complied.
c	Whether training been provided to each employee involved in maintaining the on-going integrity of process equipment?	YES	Training record available	YES	Verified.
d	Are inspections and tests performed on each item of process equipment included in the program?	YES	Records available	YES	Verified.

e	Does the inspection and test frequencies meet the manufacturer's recommendation and good engineering practice?	YES	Records available.	YES	Complied.
f	Are inspections and tests performed more frequently if determined necessary by operating experience?	YES	PM record available & frequency defined.	YES	Complied.
g	Are deficiencies in equipment that are outside limits corrected before further use so as to assure safe operation?	YES		YES	Complied.
h	In the construction of new plants and equipment, whether quality assurance programme is implemented to ensure that equipment fabricated is suitable for the process?	YES		YES	
i	Are appropriate checks and inspections made during equipment installation stage?	YES		YES	
j	Are the suitability of maintenance materials, spare parts and equipment ensured during maintenance?	YES		YES	Complied.

C-19 PHYSICAL HAZARD

C-19.1 Housekeeping

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Are all the passages, floors and the stairways in good condition?	YES		YES	Complied.
b	Is glass door taped or otherwise marked to make it visible to workers?	YES		YES	Complied.
c	Do you have the system to deal with the spillage?	YES	Dry sand, spill kit, absorbent	YES	Verified.
d	Do you have sufficient disposable bins clearly marked and whether these are suitably located? Are containers of refuse (waste) and trash emptied at the end of every day or soon after they are full? Are the containers or bins regularly cleaned?	YES	Disposable bins were placed in prominent places clearly marking for different categories of wastes like metallic, plastic, wooden etc.	YES	Verified.
e	Are drip trays positioned wherever necessary?	YES		YES	Complied.

f	Do you have adequate localized extraction and scrubbing facilities for dust, fumes and gases? Please specify	YES		YES	Complied.
g	Whether walkways are clearly marked and free from obstruction?	YES		YES	Complied.
h	Do you have any inter-departmental competition for good housekeeping?	NO		NO	Inter-departmental competition for good housekeeping to be introduced.
i	Has your organization elaborated good housekeeping practices and standards and made them known to the employees?	NO		NO	Good housekeeping practices and standards and made them known to the employees.
j	Are there any working conditions, which make the floors slippery? If so, what measures are taken to make them safe?	YES	Which will spill and soil the floor, were cleaned with suitable material spill kit available.	YES	Complied.
k	Does the company have adequate measures to suppress polluting dust arising out of materials stored on the roadside?	YES		YES	Complied.

C-19.2 Machine and General Area Guarding

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Whether machinery and equipment which can cause physical injuries to operator have been identified?	YES		YES	Complied.
b	Are all moving parts and point of operation of machinery adequately guarded?	YES	Moving parts and point of operation of machinery are adequately guarded.	YES	Goods lift rope drum guard not available
c	Are all fixed guards securely bolted in position and in good condition?	YES	fixed guards are securely bolted in position and in good condition.	YES	Complied.
d	Are all interlock guards for prevention of physical injury in good condition?	NO		NO	Interlock guards for prevention of physical injury to be maintained.
e	Are all emergency stop buttons effective and clearly labeled?	YES	Emergency stop buttons are effective and clearly labeled.	YES	Complied.
f	Are the operators for machines having moving parts aware of the danger of working with loose clothing?	YES	Training provided	YES	Complied.

g	Are the openings where there is free fall hazard covered or fenced securely?	YES	All the openings where there is free fall hazard are covered with railing and toe guard.	YES	Complied.

C-19.3 Material Handling

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Are adequate equipment available for handling materials?	YES		YES	Complied.
b	Are the workers aware of the hazards associated with material being handled?	YES	Training provided	YES	Complied.
c	Where manual handling is necessary, are the workers been trained? Do they practice this? Are workers warned for lifting of excessive weight? (Maximum weight of material for adult male and female are 55 Kg and 30 Kg respectively)	YES	Training and TBT given on regular basis.	YES	Complied.

d	Do workers follow safe procedures for storage of materials?	YES		YES	Complied.
e	Do workers follow safe procedures for storage of materials?	YES		YES	Complied.
f	Are all the statutory examinations and tests carried out and certified by competent person(s)?	YES	Form 9 Form 10 available	YES	Complied.
g	Are the operators of crane, lifts, hoists and other mechanized operations adequately qualified?	YES		YES	Complied.
h	Is the safe working load clearly marked?	YES		NO	Goods lift not having marking for SWL.
i	Has the person employed to operate crane, forklift, or to give signals to crane been medically examined for eyesight and color vision?	YES		YES	Medical clinical examination test matrix with OHC.
j	Is the frequency of eyesight and color vision examination as per the latest rules?	YES		YES	Complied.

C-19.4 Electrical Safeguarding

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Are licensed electricians available for electrical work?	YES	Available	YES	
b	Whether area classification for electrical equipment has been carried out?	YES		YES	Complied.
c	Do the electrical fittings conform to area classification for electrical equipment?	YES		YES	Complied.
d	Is a ground fault current interrupter system (ELCB) in use?	YES	ELCB, MCB & RCB being used wherever required.	YES	Complied.
e	Are all connections made by using appropriate plugs, receptacles or enclosures? Are fuses provided?	YES	Industrial plugs being used.	YES	Complied.
f	Are there any make shift connection bare wires or damaged cables?	NO		NO	Complied.
g	Is there a system of ensuring periodical inspection of hand tools, extension boards used for electrical work?	YES	Monthly schedule available	YES	Verified.

h	Do the workers use proper types of PPE during the working on live line?	NA	No employee is allowed to work on live wires, Full energy isolation is required to perform and job on machine and maintenance job is done only by authorized electrician	NA	Complied.
i	Is the separate work permit issued for working on high voltage line?	NA	No employee is allowed to work on live wires, Full energy isolation is required to perform and job on machine and maintenance job is done only by authorized electrician	NA	Complied.
j	Whether the process(s) and equipment that generate and accumulate static charge have been identified?	YES		YES	Complied.
k	Whether all such equipment including pipelines for flammable materials are properly bonded and earthed?	YES	All such equipment including pipelines for flammable materials are properly bonded and earthed.	YES	Complied.
l	Whether earth pit resistance is measured and the record maintained?	YES	Yearly inspection by electrical department , record maintained	YES	Complied.

m	Whether lightning arrestor has been installed and is adequate?	YES		YES	Marking of earth pit to be improved.

C-19.5 Safety in Storage and Warehousing

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Whether the Material Safety Data Sheet for all chemicals is available?	YES		YES	Same to be made available at storage area, control room and respective plant.
b	Are the chemicals stored as per their hazardous properties including the incompatibility?	YES	All material stored as per their compatibility.	YES	Compatibility matrix not available. Material stored on road and Ground floor of plant.
c	Are all containers clearly, indelibly labelled? Are all chemicals stored as per safety regulations?	YES	All containers clearly, indelibly labelled. All chemicals stored as per safety regulations.	YES	Complied.
d	Whether all racks and steel cages have sufficient load bearing capacity?	YES		YES	Complied.
e	Is adequate natural ventilation provided to store room? Is there any emergency exit?	YES		YES	Complied.

f	Whether adequate firefighting arrangement existing in flammable chemical storage?	YES	Fire Hydrant, Hose reels, sand Bucket, Fire Monitors all available at chemical storage area.	YES	No network in ETP area. Fire sprinklers are not evident. Need to conduct fire adequacy study and comply accordingly.
g	Whether methodology for handling spillages of hazardous chemical available along with the equipment required handling the spillage?	YES	SOP available for spillage handling.	YES	Verified.
h	Whether aisles are marked and emergency exits displayed?	YES		YES	Complied.

C-19.6 Hazard Assessment for New Equipment

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	What is the system for effecting any change in the existing plant, equipment?	YES	MOC System followed for change control	YES	MOC procedure with format available.
b	Is there system for evaluating hazards from new equipment?	YES		YES	

c	Whether the P and I diagrams and other related documents are updated accordingly?	YES		YES	P&ID needs to be updated immediately after the change is implemented
d	Is any Job Hazard Analysis (JHA) carried out after installation of new equipment?	YES		YES	Complied.

C-19.7 Hazards from Radiation Sources

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Whether licenses have been obtained for storage / handling of radioactive material?	NOT APPLICABLE	No Radioactive material being used.	There are no any radiation sources using in Industry	-
b	Whether approved Radiological Safety Officer appointed?	NOT APPLICABLE	No Radioactive material being used.	There are no any radiation sources using in Industry	-
c	Whether appropriate PPEs are used against radiation hazards?	NOT APPLICABLE	No Radioactive material being used.	There are no any radiation sources using in Industry	-

d	Is the flooring of the radioactive material handling area amenable for proper decontamination?	NOT APPLICABLE	No Radioactive material being used.	There are no any radiation sources using in Industry	-
e	Is the storage room of radiation source as per the license condition?	NOT APPLICABLE	No Radioactive material being used.	There are no any radiation sources using in Industry	-
f	Are all persons working in the facility have radiation safety training?	NOT APPLICABLE	No Radioactive material being used.	There are no any radiation sources using in Industry	-
g	Is the operators handling devices using radioactive materials qualified and possess the necessary certificate?	NOT APPLICABLE	No Radioactive material being used.	There are no any radiation sources using in Industry	-
h	Is the periodical radiation monitoring carried out?	NOT APPLICABLE	No Radioactive material being used.	There are no any radiation sources using in Industry	-
i	Are the records of inventory of radioactive material maintained in the standard format and submitted to the competent authority as per the period specified?	NOT APPLICABLE	No Radioactive material being used.	There are no any radiation sources using in Industry	-
j	Are emergency handling tools available?	NOT APPLICABLE	No Radioactive material being used.	There are no any radiation sources using in Industry	-

k	Are the personnel monitoring badges (TLD, Pocket dosimeter etc.) assigned and worn by each radiation worker?	NOT APPLICABLE	No Radioactive material being used.	There are no any radiation sources using in Industry	-
l	Are the radiation symbol and red light displayed as required?	NOT APPLICABLE	No Radioactive material being used.	There are no any radiation sources using in Industry	-

C-20 CHEMICAL HAZARD

C-20.1 Transportation of Hazardous Substances

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	What potentially hazardous materials are transported to or from the site (including wastes)	YES	List of Hazardous material transported available with Department	YES	Check list of truck/Tanker to be update (To check TREM CAD & EIP CODE on tanker
b	What mode of transport are used? 1) Road, 2) Rail, or 3) Pipelines	YES	Road	YES	Check list of truck/Tanker to be update (To check TREM CAD & EIP CODE on tanker

1	**Road**				
a	Does the company employ licensed vehicle of its own / outside sources?	YES	Outside sources vehicle are use.	YES	
b	Are the loading / unloading procedures in place and safety precautions displayed?	YES		YES	Loading / unloading procedures SOP to be displayed at area.
c	Is there a provision to check the healthiness of road tanker with respect to explosives rules?	YES	Physically checked at gate	YES	Healthiness of Road tanker should be as per explosives rules.
d	Are loaded tankers or trucks parked in a specific area on-site?	YES		YES	Procedure/SOP to be prepared & Implement
e	Do all truck and tanker drivers carry transport emergency (TREM) card or instruction booklet?	YES		NO	Check list of truck/Tanker to be update (To check TREM CAD & EIP CODE on tanker
f	Do all truck and tanker drivers get training in handling emergencies during transport?	YES	Training record available	YES	Complied.
g	Are all the tankers marked for proper Hazchem code?	YES		YES	Check list of truck/Tanker to be update (To check TREM CAD & EIP CODE on tanker

2	**Rail**				
a	What hazardous materials are transported by rail?	NO		NO	-
b	Does the company have a direct siding on site?	NO		NO	-
c	Are tankers or other wagons used in transportation?	NO		NO	-
3	**Pipelines**				
a	What materials are transported to and from the site by pipelines?	NA		NA	
b	Are the pipelines underground or over ground?	NA		NA	
c	Are corrosion protection measures employed in pipelines?	NA		NA	
d	Whether intermediate booster pumps are used?	NA		NA	

e	What is the maximum, minimum and average transfer rates?	NA		NA	
f	Are the pipelines extended in the public domain?	NA		NA	
g	Are the pipelines dedicated for each type of chemicals?	NA		NA	
h	Are the pipelines fitted with safety equipment such as leak detectors, automatic shut-off valves etc.?	NA		NA	
i	What is the frequency and method of testing of the pipeline?	NA		NA	
j	Is there written procedure for tackling leakages in pipeline?	NA		NA	

C-20.2 Handling of Hazardous Substances

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	What are the hazardous substance handled in the factory?	YES	Methanol, H_2, VDF etc..	YES	Verified.
b	Whether quantity of hazardous substances is above the threshold limit specified in the Manufacture, Storage and Handling of Hazardous Substances Rule, 1989? If yes, then required documentation is available as per the rule.	YES	Required documents are available.	YES	Well documented and all licenses updated.
c	Whether written procedure for handling the hazardous substance is available and operators are trained for handling such substances including actions required in case of leakages and spillages?	YES	Do's and Don'ts displayed & SOP is available, Training provided	YES	SOP for handling to be displayed at site

d	Are the employees aware of the hazards arising from hazardous substances and safety precautions to be taken during handling of these?	YES	Training provided	YES	Verified.

C-20.3 Material Safety Data Sheets (MSDS)

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Are the material safety data sheets available for all the chemicals handled, used and manufactured in the factory?	YES	MSDS for all chemical used in plant are available.	YES	Complied.
b	Whether the latest MSDS are displayed at strategic locations?	YES	Available & displayed at respective department	YES	Verified.
c	Is it available in local language?	YES		YES	Complied.

C-20.4 Spill Control Measures

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Whether spill control procedure is available?	YES	SOP, MSDS, Do's and don'ts available	YES	Verified.
b	Whether spill collection pit / sump is available at the workplace?	YES		YES	Complied.
c	Whether methodology for recovery / disposal of collected material has been established?	YES	SOP available for collected material	YES	Complied.

C-20.5 Storage of Hazardous Substances

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Whether storage vessels are identified with the capacity as required under MSIHC, Rules 1989.	YES		YES	Complied.

b	What are the storage pressure and temperature?	YES	Data available	YES	Complied.
c	Whether vessels are above ground / underground?	YES	above ground	YES	Complied.
d	If any of the tanks storing flammable material, whether electrical equipment and fittings are as per electrical area classification?	YES		YES	Complied.
e	Is the bunded area takes into account the total quantity of the largest tank?	YES		YES	Complied.
f	Whether the bund perimeter takes into consideration of trajectory of leak from tank?	YES		YES	Complied.
g	Are the vessels properly bonded and earthed and whether periodically checked and record maintained?	YES	Record available	YES	Complied.
h	Are the vessels fitted with remotely controlled isolation valves?	YES	As per requirement	YES	Complied.
i	Are vessels provided with emergency vent, relief valve, bursting disc, level indicator, pressure gauge, overflow line?	YES	Vessels are provided with emergency vent, relief valve, bursting disc, level indicator, pressure gauge, overflow line as required.	YES	Vents available with wire mesh.

j	Where do such vents discharge?	YES	In atmosphere	YES	Complied.
k	Are the vessels provided with alarms for high level, high temperature and high pressure?	YES	Vessels are provided with alarms for high level, high temperature and high pressure as required.	YES	Complied.
l	Are standby empty tanks or any other alternate systems provided for emptying / transfer in case of emergencies?	YES		YES	Complied.
m	What are the provisions made for firefighting / tackling emergency situations around the storage vessels?	YES	Fire-fighting system available	YES	Sprinkler system to be reviewed. Holes in pipe instead of standard sprinkler.
n	Has any consequence analysis for loss of containment been carried out?	YES		YES	Complied.
o	Whether the vessels are tested as per statute?	YES	Form 11 maintained	YES	Verified.
p	Whether log sheets are filled up on daily basis for recording the parameters of these vessels?	YES		YES	Verified.
q	Whether monitors for detection of leakage of flammable / toxic material installed?	YES		YES	Verified.

r	Whether the chemicals stored are as per their compatibility?	YES		YES	Complied.

C-20.6 Gas Cylinders

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	What are the various gas cylinders used in the plant?	YES	Hydrogen, Air, Argon, Oxygen etc.	YES	Complied.
b	Are valid licenses available for storing all these cylinders?	YES		YES	Verified.
c	Are the cylinders stored and segregated as per their compatibility?	YES	Cylinders are stored and segregated as per their compatibility.	YES	Complied.
d	What are the measures taken for combating any emergency in the cylinders storage area?		SCBA set, Fire hydrant system, fire extinguisher	YES	Complied.
e	Whether integrity test certificates are obtained from the suppliers of the cylinders?	YES	Records available	YES	Verified.
f	Are the cylinders chained and secured properly along with the valve caps and proper identification colour code?	YES	Cylinders are chained and secured properly along with the valve caps and proper identification colour code.		

g	Are the cylinders protected from heat or sun and rain?	YES	Cabinet provided	YES	Verified.
h	Whether monitors for detection of leakage of flammable / toxic gas installed?	YES	Fixed GDS	YES	Verified.

C-20.7 Labeling and Color Coding

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Are all the containers, vessels and storage tanks labeled for its content and capacity?	YES	All the containers, vessels and storage tanks are labeled for its content and capacity.	YES	Complied.
b	Whether the pipelines are colour coded as per IS 2379?	NO		NO	
c	Is any plant specific colour code followed?	YES		YES	Complied.
d	Whether the colour codes are displayed conspicuously in the working areas?	YES	Display boards available for colour coding	YES	Verified.

C-20.8 Hazardous Waste Management

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Is identification done for various types of hazardous wastes?	YES	Identification done As per GPCB Norms	YES	Complied.
b	Are these quantities less than those specified by the Hazardous Wastes (Management & Handling) Rules, 1989?	YES	Quantities are less than those specified by the Hazardous Wastes (Management & Handling) Rules, 1989, As per GPCB Norms	YES	Complied.
c	What are their disposal modes?	YES	Processing, Co-processing etc. As per GPCB Norms	YES	Pass book and agreement copy with TSDF.
d	What are the systems / measures adopted for controlling air / water / land pollution?	YES	Full fledge ETP , form 37 maintained, Storm water drain is available not connected to process line.	YES	Complied.
e	Whether the solid waste like combustibles, plastic, metals etc. segregated?	YES	Segregated as per GPCB Norms	YES	Complied.

C-21 FIRE AND EXPLOSION HAZARD

C-21.1 Organizational Set-up for Fire Fighting

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	What is the total strength of fire station and fire crew?	YES	24	YES	Complied.
b	How many fire crews are available in each shift?	YES	08	YES	Verified.
c	Is there fire squad identified in each shift?	YES	Trained ERT member list is displayed at main gate.	YES	Regular periodical ERT training to be done & record to be maintained.
d	Standing fire order is available with latest revision	YES		YES	Covered – in Training
e	How is the communication with fire station?	YES	Through Phone	YES	Complied.
f	Does fire safety inspections carried out?	YES	Records available	YES	Verified.
g	Does emergency procedure available for leakage or combustion of flammables?	YES	On-site emergency plan available & reviewed and update periodically.	YES	Complied.
h	What measures are available to control the fire load in the plant area?	YES	Hydrant, sprinklers fire extinguishers available, Fire Monitor & Hose reel.	YES	Complied.

i	Whether technical knowledge and skills of the manager and staff responsible for overall fire safety of the plant is adequate?	YES		YES	Complied.
j	How many major and minor incidents / fires were there in the factory during the last five years? Give department / plant wise.	YES	Data available with Safety department	YES	Verified.
k	Have all the fires / incidents been investigated and corrective actions taken? Give break-up.	YES	Data available with Safety department	YES	Verified.
l	**Resources:**				
a	Adequacy of protective clothing (coat, trouser, gloves, boots and helmets);	YES		YES	Adequate.
b	Availability of SCBA for firefighting operations and spare cylinders (at least 2 for each SCBA);	YES		YES	Complied.
c	Adequacy of hose, nozzles, ladders, lighting equipment and pumps; and	YES	Inspection done on regular basis, Record available	YES	Fire pumps installed in fire station only.
d	Communication facility at fire station, walkie talkie sets during firefighting.	YES	Mobile and Walkie talkie	YES	Security control room is common control room. No fire stations.

					Mobile and land line phones are means of communication.

C-21.2 Built in Safety in Civil Design and Construction

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Whether the two safe means of escape available? Are they in separate directions?	YES	Safe means of escape available & they are in separate directions.	YES	Complied.
b	Is emergency exits provided to the building handling flammables?	YES	Where flammable material being handled.	YES	Complied.
c	Whether emergency lights are provided?	YES	Emergency lighting provided in Plant & marked. Records available.	YES	Complied.
d	Whether fire / smoke detectors are installed in fire prone areas?	YES		YES	Complied.
e	Whether fire call points are provided in different areas?	YES		YES	Complied.
f	Whether Fire hydrants are provided near the buildings?	YES	Fire hydrants are available and regular inspection done.	YES	Complied.

g	Is ventilation system in plant handling flammables is adequate to prevent formation of flammable mixtures?	YES		YES	Complied.
h	Is adequate separation is provided between combustible / flammable materials and other material to restrict the fire growth?	YES		YES	Complied.
i	Access routes for firefighting operations is available for areas having high fire load	YES	Access routes for firefighting operations is available.		Verified.
j	Whether building changes interferes with fire detection and / or fire suppression systems?	YES		YES	Complied.
k	Whether building changes cause unreasonable fire loading / openings in the fire rated walls?	NO		NO	--

C-21.3 Built in Safety in Electric Circuits and Equipment

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Are the electrical equipment in areas where flammables mixture is likely to be present of flame-proof type?	YES		YES	Regular periodical Inspection of earthing jumpers & flame roof electrical fittings & equipments are carried out & records are maintained
b	Are lightning arrestors are provided to the buildings / structures storing flammable materials?	YES		YES	Complied.
c	Whether adequate bonding and grounding of electrical equipment / pipelines provided?	YES		YES	Complied.

C-21.4 Explosive Substances

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Whether necessary license / approval taken from concerned statutory bodies?	YES	Necessary license / approval taken from concerned statutory bodies.	YES	Storage capacity tank wise not provided.
b	Whether systems for explosion suppression, high speed fire detection with deluge, sprinklers, explosion venting etc. are provided?	YES	Fire hydrant sprinklers MCP, Fire monitor.	YES	Only hydrant system is available. Sprinkler system in storage tank area is in manual mode.
c	Whether explosion resistant walls or barricades are provided around explosive storage?	YES		YES	Complied.
d	Whether explosive substance storage areas are restricted for entry?	YES	Explosive substance storage areas are restricted for entry	YES	Complied.
e	Whether only trained persons are handling explosive substances?	YES	Training data available.	YES	Records Verified.
f	Whether explosive substances are stored and transported in approved containers only?	YES	Documents verified as per explosive rules	YES	Complied.

g	Whether electrical fixtures in areas handling explosives are explosion proof type?	YES	Regular periodically inspection of flame proof electrical fixtures is carried out & records are maintained	YES	Verified.
h	Whether adequate measures are taken to prevent any sources of ignition where explosive substances are handled?	YES		YES	Complied.

C-21.5 Fire Safety in Handling Flammable and Explosive materials

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Whether emergency procedure is available for control of leakage?	YES	OSEP available	YES	Verified.
b	Whether emergency measures are displayed locally in case of accidental spillage / leakage?	YES	Safety Board are displayed.	YES	Complied.
c	Whether facility is provided for safe drainage of combustible or flammable liquids in case of leakages?	YES	Collection pit available	YES	Complied.
d	Whether highly flammable liquids are stored under inert atmosphere?	YES		YES	Complied.

e	Whether flammable storage tanks are provided with flame arrestors?	YES		YES	Complied.
f	Whether suitable PPEs are provided?	YES	Suitable PPEs are provided.	YES	Complied.

C-21.6 Fire Detection and Alarm System

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	What type of fire detection and alarm system provided?	YES		YES	Complied.
b	Whether all fire prone areas of the plant are covered with fire detection system?	NO		NO	Complied.
c	Whether fire detection equipment and smoke alarms in good operating condition?	YES		YES	Complied.
d	Whether the number of fire call points are adequate and free from obstruction?	YES		YES	Complied.
e	Whether regular inspection / maintenance / testing of fire detection and alarm system carried out and records maintained	YES		YES	Complied.

f	Whether any atmospheric monitoring is carried out for explosive mixture of gases or vapors?	YES			Complied.
g	Whether emergency power supplies are provided to fire detection and fire alarm system?	YES		YES	Complied.
h	Whether smoke detectors are located considering ventilation pattern?	YES		YES	Complied.
i	Whether annunciation of fire is local or in the control room or in both places?	YES		YES	Complied.
j	Whether fire panel is constantly attended?	YES		YES	Fire control room is at security control room.

C-21.7 Passive and Active Fire Protection System

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	What are the passive fire protection measures available? (Barriers, doors, dampers etc.)	YES		YES	Complied.
b	Are the areas requiring fire barriers identified?	YES		YES	Complied.
c	Whether the fire barrier provided is of adequate ratings?	YES	Adequate rating fire barriers is provided.	YES	Complied.
d	Whether ventilation ducts in flammable areas have been provided with isolation dampers of suitable fire rating?	NA	We don't have process that required isolation dampers in flammable areas	NA	-
e	Whether sprinklers / deluge are installed wherever necessary?	YES	Storage Area	YES	Verified.
f	Whether regular inspection / maintenance / testing of fire protection system carried out and records maintained?	YES	Record maintained	YES	Verified.

C-21.8 Fixed Fire Extinguishing System

SR. NO.	ATTRIBUTE	AUDITEE INPUTES	AUDITEE REMARK	AUDITOR INPUTES	AUDITOR REMARK
a	What are the sources of firewater and whether they are dedicated to the fire extinguishing system?	YES	GIDC water	YES	Complied.
b	Whether the capacity of dedicated water reservoir is adequate to supply to hydrants for minimum 2 h?	YES		YES	Complied.
c	Whether un-interrupted power supply is provided to the firewater pumps?	YES	D.G Set provided	YES	Complied.
d	Whether the extinguishing medium selected is appropriate to the class of fire (water, gaseous, foam, dry powder)?	YES	Extinguishing medium selected is appropriate to the class of fire.	YES	Complied.
e	Whether fire hydrants layout is available?	YES	Fire hydrants layout is available.	YES	Complied.
f	Whether additional (over minimum requirement) fire hoses, nozzles are available?	YES		YES	Complied.

g	Whether the hydrants lines are kept pressurized?	YES	7 kg/cm2 pressure maintained in fire hydrant line.	YES	Complied.
h	Whether regular inspection / maintenance / testing of fixed fire extinguishing systems carried out and records maintained?	YES	Maintenance, Inspection and testing carried out by Third party. Record available	YES	Verified.

C-21.9 Portable Fire Extinguishing System

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Whether suitable type and numbers of fire extinguishers provided?	YES		YES	Complied.
b	Whether the fire extinguishers are located at conspicuous position and easily accessible? Are they fully charged and tagged?	YES	Inspection done on regularly basis ,records available	YES	Complied.
c	Whether fire extinguishers periodically inspected, tested, refilled and records maintained?	YES	Inspection done on regularly basis ,records available	YES	Complied.
d	Whether defective / unchecked fire extinguishers present at site?	NO		NO	Follow IS 2190

e	Whether additional fire extinguishers are available?	YES		YES	Complied.

C-21.10 Fire Fighting Equipment and Facilities

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Whether fire tenders (water / foam) are available?	YES		YES	Fire Tender and Fire hydrant system is available.
b	Whether the fire-fighting system and equipment approved, tested and maintained as per relevant standard?	YES	Firefighting system tested and maintained by third party.	YES	Complied.
c	Whether the SCBA / fire suit provided to firefighting team for immediate action?	YES		YES	Complied.
d	What is system for maintenance / recharge of SCBA?	YES	Inspection done on regularly basis ,records available	YES	Out sourced.
e	Is proper access available for firefighting equipment?	YES	Proper access available for firefighting equipment.	YES	Complied.

f	Whether fire hose cabinets are in good condition, easily visible, and accessible?	YES	Inspection done on regularly basis ,records available	YES	Hose reel found damaged in alpha plant.
g	Whether drill tower is available? Are fire personnel carrying out regular fire drill?	YES		YES	Wet drill performed at regular interval.
h	What is the communication facility at fire station? Is it adequate?	YES	Telephone Mobile phone, Walky Talky	YES	Complied.

C-21.11 Fire Drill

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Whether mock fire drills are conducted? What is the frequency of drills?	YES	Every Month	YES	Records verified.
b	Whether fire drills are also performed in night shift	YES		YES	Drills in odd hours to be documented.
c	Whether feedback of fire drill is documented?	YES	Always maintain all the document	YES	Documents Verified.
d	What is the system of mutual-aid scheme?	YES	Records Available.	YES	Documents Verified.

C-21.12 Fire Fighting Training

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Whether there is a system of providing fire- fighting training to plant personnel?	YES	fire- fighting training to plant personnel is provided monthly. Records are available.	Monthly	Complied.
b	What is the frequency and duration of such training? Whether training records are maintained?	YES	2 Hrs./month	YES	Complied.
c	Whether fire squads are identified for different areas for first-aid firefighting and rescue, and suitably trained?	YES	Details available at SHE	YES	Complied.
d	Are all personnel conversant with the fire prevention and protection measures?	YES	Training provided	YES	Complied.
e	Whether the fire staff are sent for refresher / advanced training courses?	YES		YES	Internally trained.

C-21.13 Static Electricity and Lightning

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Whether all vessels and pipes are provided with suitable bonding and grounding?	YES	Regular inspection done.	YES	Complied.
b	Whether arrangement has been made for grounding the tanker containing flammable liquid during loading / unloading?	YES		YES	Complied.
c	Whether spark resistant tools are provided?	YES		YES	Complied.
d	Whether lightning protection is provided and is adequate?	YES		YES	Complied.
e	Whether antistatic clothing, hand gloves and footwear are provided?	YES		YES	Complied.

C-21.14 Pressure Relief System

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Whether the listing of all 'pressure plants' [as defined under Factories Act] has been done?	YES	Form 11 Maintained.	YES	Records verified.

C-22 INDUSTRIAL HYGIENE / OCCUPA- TIONAL HEALTH

C-22.1 Ventilation, Illumination, Noise, Vibration, Heat stress and Non-Ionizing Radiations

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
C-22.1.1 Ventilation					
a	Whether any ventilation study has been carried out?	YES	Ventilation study is carried out by 3rd party agency.	YES	
b	Whether natural ventilation is adequate or not?	YES	ADEQUATE	YES	Complied.
c	Whether dust / fumes / hot air is generated in the process?	YES		YES	Dust Extraction system is available.

d	Is there any exhaust ventilation system in any section of the plant?	YES	Ventilation duct provided	YES	Verified.
e	Is periodic / preventive maintenance of ventilation system carried out and record is maintained?	YES	Record maintained	YES	Verified.
f	Does any ventilation system re-circulate the exhausted air in work areas?	NO	No ventilation system re-circulate the exhausted air in work areas.	NO	Complied.
g	Is the work environment assessed and monitored for chemical and physical hazards?	YES	Form-37 maintained	Environment monitoring is done.	Records verified.
h	Whether PPE are provided to workers exposed to dust / fumes and gases?	YES	Dust mask	YES	Complied.
C-22.1.2 Illumination					
a	Whether illumination study has been carried out for the assessment of illumination level?	YES		YES	Complied.
b	Is there any system of periodical cleaning and replacing the light fittings / lamps in order to ensure that they give the intended illumination levels?	YES	Regular inspection done.	YES	Complied.

c	Are the workers subject to periodic optometry tests and records maintained?	YES		YES	Verified.
d	Are emergency lighting available at first aid center.	YES		YES	Complied.
C-22.1.3 Noise					
a	Whether any noise study conducted?	No		No	Noise study to be carried out.
b	Are there any machines / processes generating high-noise?	YES	DG set, Compressor, Blower	YES	Complied.
c	Whether engineering and administrative controls been implemented to reduce noise exposure below the permissible limits?	YES		YES	Complied.
d	Is there a system of subjecting all those employees to periodic audiometric test who work in high- level noise areas?	YES	Record maintained at OHC	YES	Complied.
e	Whether the workers are made aware of the ill effects of high noise?	YES	Training provided	YES	Records verified.
f	Whether ear muffs / plugs are provided and used?	YES	Ear muffs / plugs are provided and used in high level Nosie area.	YES	Complied.

C-22.1.4 Vibration					
A	Are there equipment which contribute excess level of vibrations and whether they are identified?	NO		NO	No such equipment identified.
b	Whether any vibration study has been carried out?	NO		NO	Vibration study to be carried out.
c	Are the measures taken to combat vibration to acceptable levels?	NO		NO	Vibration study to be carried out.
d	What is the frequency for measurements of vibration?	NO		NA	
e	Are the records of measurements and maintenance of equipment / system maintained?	NO		NA	
C-22.1.5 Heat Stress / Cold stress (Extremes of Temperature)					
a	Are there sources from equipment increasing the heat load in work places?	YES	steam line	YES	Complied.
b	Whether evaluation of heat stress is carried out?	NA	-	NA	-
c	Whether natural ventilation is adequate to minimize the heat stress in work environment?	YES	Adequate.	YES	Complied.
d	Are resources available to deal	YES	Drinking water, lined	YES	Complied.

	with very hot or very cold conditions (drinking water, lined gloves, insulated boots)?		gloves available to deal with hot conditions.		
e	Do workers know the symptoms of heat cramps / heatstroke or frost bite / hypothermia?	YES		YES	Complied.
f	Are the personal protective equipment suitable for reducing the effects of heat stress available?	YES		YES	Complied.
C-22.1.6 Non-Ionizing Radiations					
a	Does the work involve likely exposure to non-ionizing radiations (ultraviolet, infrared, radiofrequency, microwaves, lasers, etc.?)	YES	Welding & Gas cutting operations.	YES	Complied.
b	Whether risk assessment have been done for all work areas involving presence of non-ionizing radiations?	YES		YES	Complied.
c	Are the work areas displayed with relevant safety signs?	YES		YES	Complied.
d	Are the employees aware about the hazards of non-ionizing radiations?	YES	Training provided	YES	Complied.

e	Does written procedures exists for working in non-ionizing radiations?	YES		YES	Complied.
f	Is the work environment monitored periodically for physical hazards and control measures initiated whenever deviation from permissible values is observed?	YES		YES	Complied.
g	Whether suitable personal protective equipment are provided to workers exposed to non-ionizing radiations?	YES		YES	Complied.

C-22.2 Work Place Monitoring for Hazardous Chemicals

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Whether the dust, fumes, smoke aerosols and mist are monitored as per statute and records maintained?	YES	Form 37 maintained.	YES	Verified.

b	What are the types of detectors used for monitoring concentration of hazardous chemicals?	YES	Smoke, Chlorine, Hydrogen, beam types	YES	Complied.
c	Is any alarm system installed for any leakage of hazardous chemicals?	YES	Chlorine, Hydrogen	YES	Complied.
d	Are antidotes available for toxic chemicals?	YES	Listed in OSEP	YES	Verified.
e	Are control measures initiated whenever deviation from permissible values is observed?	YES		YES	Complied.

C-22.3 First Aid Facilities and Occupational Health Centre (OHC)

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Are adequate numbers of first aid boxes provided? Give location details?	YES		YES	Complied.
b	Are qualified / trained first aiders available in each shift?	YES		YES	Trained first aiders available in each shift.
c	How many qualified / trained first	YES		YES	Complied.

	aiders are available at each plant / department?				
d	How many persons are trained / given refreshers training in first aid in a year?	YES	As per requirement	YES	Certified Refreshers training in first aid in a year to be conducted.
e	Whether occupational health center is provided?	YES	Full fledge OHC is available.	YES	Complied.
f	Does OHC conform to the provisions of the existing statutes?	YES	OHC is built as per requirement of GFR.	YES	OHC facility should be verified GFR 1963 Rule 68U.
g	Are the Medical Attendants / Doctors available in each shift?	YES		YES	Complied.
h	What facilities are available for transportation of the injured to hospital?	YES	One ambulance with driver and tie up with Hospital at Ankleshwar.	YES	Complied.
i	Are the names of the trained first aiders displayed?	YES	Digital boards displayed with ERT members.	YES	Complied.
j	Are the name of nearest hospitals and its telephone number available in OHC?	YES		YES	Name of nearest hospitals and its telephone number should be available in OHC.
k	Does the plant have any special preventive medicine program?	YES		YES	Complied.
l	Is ambulance posted in proper place and is it available whenever required?	YES		YES	Complied.

m	Are sufficient numbers of anti-dotes available in case of any emergency?	YES	Sufficient numbers of anti-dotes available in case of any emergency in OHC.	YES	Complied.
n	Are fire safety measures provided in fire aid Centre?	YES		YES	Complied.
o	Are emergency lighting arrangements available at first aid Centre?	YES		YES	Ensure emergency lighting is provided in first aid centers to be periodically inspected & tested & record to be maintained.

C-22.4 Periodic Medical Examination

SR. NO.	ATTRIBUTE	AUDITEE INPUTES	AUDITEE REMARK	AUDITOR INPUTES	AUDITOR REMARK
a	Whether the periodical medical examination of employees, required under relevant statute is carried out?	YES	Form No. 32 For company employee and contractor worker maintained	YES	Verified.
b	Whether it is ensured that contractors employee are medically examined during pre-employment as well as during the course of employment?	YES	Form: 33 for pre-employment and medical checking are carried out.	YES	Verified.

c	During the periodical medical examination of the workers, are they examined as per the hazardous process in which they work? (First schedule of The Factories Act, 1948)	YES	Periodical medical examination as per statutory.	YES	Verified.
d	Are the records of all such examination maintained?	YES	Records are well maintained.	YES	Verified.

C-22.5 Personal Protective Equipment and Emergency Equipment

SR. NO.	ATTRIBUTE	AUDITEE INPUTES	AUDITEE REMARK	AUDITOR INPUTES	AUDITOR REMARK
a	Whether list of required PPE for each hazardous activity is available?	YES	List of required PPE for each hazardous activity is available and provided.	YES	Complied.
b	Whether feedback from workers obtained during selection of PPE?	YES		YES	Complied.
c	Have the workers been trained in proper use of PPE including BA sets?	YES	Training given and records available	YES	Complied.
d	What is the system of procurement, inspection, issue,	YES		YES	The system procedure/SOP of procurement, inspection, issue,

	maintenance and replacement of PPE?				maintenance and replacement of PPE prepared & implemented
e	Whether qualitative and quantitative fit-check for respirators is ensured prior to use?	YES		YES	Complied.
f	What are the arrangements for safe custody and storage of PPE?	YES	Locker provided, PPE's box provided at each plant area	YES	Complied.
g	Are the contractor's workers provided with the required PPE?	YES		YES	Complied.
h	Do the PPE conform to any standard?	YES	PPE conforms to IS standard	YES	Complied.
i	Are sufficient eye wash fountains and safety showers available?	YES	Sufficient eye wash fountains and safety showers are available. Total 58 numbers.	YES	Verified.
j	Whether appropriate respiratory protective devices are available in accordance to the hazard potential?	YES		YES	Complied.
k	Are the staff members trained in the right uses of respiratory protective devices?	YES		YES	Complied.

C-22.6 Occupational Diseases

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Whether pre-employment medical checkup data available?	YES	Form:- 33 data are maintained.	YES	Verified.
b	During the medical checkup, is any person found having occupational diseases mentioned in 3rd schedule of The Factories Act, 1948?	NO	There is no having occupational diseases found mentioned in 3rd schedule of The Factories Act, 1948	NO	Complied.
c	Whether the medical practitioner informed the Chief Inspector of Factories about the occurrence of the occupational disease?	YES	No such diseases detect till date.	YES	Complied.

C-23 ACCIDENT / INCIDENT REPORTING, INVESTIGATION AND ANALYSIS

C-23.1 Accident Reporting and Database Management

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	What is the procedure for accident / incident / dangerous occurrence reporting?	YES	Online "Suraksha Setu" portal has been used to reporting any kind of incident/accident, near miss, safety observation	YES	Verified.
b	Whether the accident data for the last five years for reportable and non-reportable accidents are available?	YES	Accident data available at Safety and HR Department.	YES	Verified.

C-23.2 Accident Investigation

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Are all the accidents investigated?	YES	Available at Safety and HR Department.	YES	Verified.

b	Whether accident investigation procedure is documented?	YES	Accident data available at Safety and HR Department.	YES	Verified.
c	Whether accident investigation reports are submitted to top management?	YES	Accident data available at Safety and HR Department.	YES	Verified.
d	How are the findings from accident investigation reports communicated to workers?	YES	Through mail & training and discussed in safety committee.	YES	Verified.

C-23.3 Analysis of Accidents

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Whether accident analysis is done as per IS 3786?	YES		YES	Accident analysis to be done as per IS 3786
b	Whether root causes of accidents are analyzed?	YES		YES	Procedure for accident / incident / dangerous occurrence reporting & investigation prepared & implemented.
c	Is the accident statistics effectively utilized? If yes, how?	YES	The data is apprised to avoid reoccurrence, for preventive action and to identified the training needs	YES	The accident statistics to be utilized effectively.

d	What nature of injuries occurred during the last five years?	YES	Soft tissue injuries, Sprain Injuries and Slip-Trip types of injuries.	YES	Complied.

C-23.4 Implementation of Recommendations

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	How does the management ensure implementation of the recommendations to avoid recurrence of accidents and incidents?	YES	By discussion, inspection, different types of safety reports, safety Audit and CAPA	YES	Complied.

C-23.5 Reporting and Investigation of Near-miss Incidents

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Are all near-miss incidents reported and investigated?	YES	Data Maintained.	YES	Verified.

b	Is there any system of classifying and analyzing the near-miss incidents?	YES		YES	Complied.

C-24.1 Site Specific Details

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Are the site area maps (including layout, access roads and assembly points) available in control room / emergency control center?	YES		YES	Complied.

C-24.2 Duties and Responsibilities of Key Personnel

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Is the hierarchy of emergency response personnel right from site emergency controller downward, and alternative officials identified?	YES	Organogram Available	YES	Complied.

B	Are the duties and responsibilities assigned to the designated officials during emergency, both during and outside normal working hours clearly identified and understood by them?	YES	Covered in OSEP	YES	Verified.

C-24.3 Identification of Emergencies and Accident Scenario

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Are the possible accident scenarios leading to emergency identified and known to the operating personnel?	YES	Covered in OSEP	YES	Verified.
b	Are approved emergency preparedness plans (on- site and off-site) in place?	YES	Covered in OSEP	YES	On-site plan is available.

C-24.4 Declaration and Termination of Emergency

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Is the list of designated officials who are to be communicated about declaration and	YES	Covered in OSEP	YES	Verified.

	termination of emergency available in the control room / emergency control center?				
b	Are the methods of communication (siren, public address system etc.) for declaration and termination of an emergency known to all the workers?	YES	Covered in OSEP	YES	Verified.

C-24.5 Resources-evacuation / Transport

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Are the following resources (equipment, personnel and procedures) required to handle emergency available?	YES		YES	Complied.
1	Communications,	YES	PA system, telephone, Mobile	YES	Complied.
2	Public announcement systems	YES		YES	Complied.
3	Monitoring of hazardous releases into the environment,	YES	Portable multiple gas detector is available,	YES	Complied.
4	Emergency shelters at the facility,	YES		YES	Complied.

5	Emergency exits with proper illumination, with uninterrupted power supply ,	YES	Emergency exits with proper illumination, with uninterrupted power supply is provided.	YES	Complied.
6	Direction for emergency exit / escape route marked in haulage / Alleyways,	YES	Evacuation plan is available and displayed.	YES	Complied.
7	Transport for evacuation of plant personnel,	YES		YES	Complied.
8	Medical care including administration of antidotes, and	YES	Antidotes details available at OHC.	YES	All antidotes are available.
9	Security / maintenance of law and order.	YES	Training given.	YES	Complied.

C-24.6 Communication Facilities

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Does the emergency control center have direct communication links with the fire station and the plant control room?	YES		YES	Complied.
b	Are there adequate alarm points from which an emergency alarm can be raised?	YES		YES	Complied.
c	Is there infrastructure available for ensuring backup electric power supply for communication links where required	YES	UPS system available, DG set available	YES	Complied.

C-24.7 Medical Care

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Is the procedure for emergency medical care available?	YES		YES	Complied.

b	Whether the system has been tested at regular frequency through mock drill / exercises for its adequacy?	YES	Quarterly mock drill conducted. Record available	YES	Verified.
c	Does the system of periodic replacement of antidotes and medicines required in emergency exist?	YES	Replacement done as per expiry dates	YES	Complied.

C-24.8 Updation of Emergency Plan

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Is the emergency plan updated based on the feedback from the periodic drills / exercises?	YES	On-site Emergency Action Plan is updated.	YES	Complied.
b	Are the contact details of all concerned officials kept updated in the emergency plan?	YES	On-site Emergency Action Plan is updated.	YES	Complied.

C-24.9 Periodic Drills / Exercises

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Are mock-exercises conducted at stipulated intervals?	YES	Quarterly on difference scenarios	YES	Complied.
b	Are the scenarios varied in the mock-exercises to ensure that all possible factors including meteorological conditions, affected plant personnel covered?	YES		YES	Complied.
c	Whether emergency preparedness Plans have been tested and reviewed at regular frequency through mock drill for its adequacy	YES		YES	Complied.

C-24.10 Training of Plant Personnel

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	AUDITEE REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Are the plant personnel trained in handling emergency equipment?	YES	Training given on regular basis.	YES	Complied.

C-24.11 Public Awareness Programmes

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	AUDITEE REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Are public awareness programs conducted for the people around the site regarding the actions to be taken in case of off-site emergency?	YES		YES	Complied.

C-24.12 Mutual-aid Programme

SR. NO.	ATTRIBUTE	AUDITEE INPUTES	AUDITEE REMARK	AUDITOR INPUTES	AUDITOR REMARK
a	Are the types of accidents where external organizations would be involved in remedial actions identified? Are their responsibilities defined?	YES	Covered in OSEP	YES	Verified.
b	Is the plant responsible for rendering mutual aid assistance to any other external organizations? Does this assistance effect the plant's emergency preparedness?	YES	No it doesn't affect the plant's emergency preparedness	YES	Complied.

c	Whether the communication channels for mutual assistance identified and known with and between two organizations?	YES	Communication channels for mutual assistance identified and known with and between two organizations.	YES	Complied.

C-24.13 Emergency Control Centre

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Is the emergency control center located beyond the effective distances of identified emergency scenarios?	YES	Emergency control center located beyond the effective distances of identified emergency scenarios. ECC located at Gate beyond the effective distances of any identified emergency scenarios.	YES	Complied.
b	Is the emergency control center located beyond the effective distances of identified emergency scenarios?	YES	ECC located at Gate beyond the effective distances of any identified emergency scenarios.	YES	Complied.

C-25 SAFETY INSPECTION

C-25.1 Inspection Programme

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Are checklists available for inspections? For example availability of checklists like: a) Handling, Storage and Transportation of hazardous chemicals; b) Electrical hazards; c) Fire safety; d) Hand and portable power tools; e) Machine hazards; f) Lifting equipment; g) Ladders and scaffolding; h) Environmental Monitoring; j) Civil structure; k) Housekeeping; m) Emergency equipment; and n) Gas cylinder and other pressure vessels used / available in the organization	YES		YES	Complied.

C-25.2 Safety Related Deficiency (SRD) Report

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Are SRDs generated based on the area wise checklists?	YES	Process related and plant related deviation reported	YES	Complied.
b	What is the procedure for resolving the SRDs?	YES	Sheet maintained/ checklist available. (standard format is available)	YES	Verified.
c	Whether the procedure exists for notification and root cause analysis of non-conformities and action taken on them?	YES		YES	Complied.

C-25.3 Safety Inspection Records

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Are the safety inspection records maintained?	YES	Records available.	YES	Complied.

C-25.4 Methodology and Inspection Team

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	Is there written procedure for safety inspection?	YES	Data available.	YES	Complied.
b	Whether safety inspection is carried out by a designated team?	YES	EHS department team done these jobs with help of concerned department HOD	YES	Complied.
c	What is the frequency of safety inspections?	YES	Every Month	YES	Complied.
d	Whether an inspection report is generated?	YES	Records available.	YES	Complied.

C-25.5 Compliance of Recommendations

SR. NO.	ATTRIBUTE	AUDITEE INPUTES (Y/N)	CLIENT REMARK	AUDITOR INPUTES (Y/N)	AUDITOR REMARK
a	To whom the recommendations are submitted	YES	To concern area In-charge	YES	Complied.
b	Are recommendations of safety inspections complied in time?	YES	Complied on time and Record available.	YES	Verified.

c	Is compliance of recommendations sent to top management?	YES	Record available	YES	Verified.
d	Is compliance of recommendations reviewed by safety committee?	YES	Record available	YES	Verified.
e	Does top management follows-up the compliance?	YES	Record available	YES	Verified.

END OF REPORT

M/s. GUJARAT FLUOROCHEMICALS LTD.

Plot No. 12/A, G.I.D.C. Dahej, Tal. – Vagra, Dist. – Bharuch - 392 130 (Gujarat).

SAFETY AUDIT REPORT

OF

M/s. GUJARAT FLUOROCHEMICALS LIMITED

DAHEJ

DCEMBER 2024



719, 720 & 722, Western Business Park,
Opp. S. D. Jain School, Vesu - Surat.
PIN - 395 007.
Ph. No. +91 - 89811 00563.

ACKNOWLEDGEMENT

We express our sincere thanks to Management and Employees of **M/s. Gujarat Fluorochemicals Ltd. – Dahej** for their co-operation and unstinted help without which the Safety Audit could not have been possible. The Courtesy and Cordiality extended to the audit team is highly appreciated.

We do appreciate the best planning and constant co-operation from **Mr. Satheesh Kumar** and their team for their very enthusiastic support for successful completion of this assignment.

01.02.2025 **PROSAFE PROCESS ENGINEERING PVT. LTD.**

SURAT **AUTHORIZED SIGNATORY**

DISCLAIMER

This report was prepared by **M/s. Prosafe Process Engineering Pvt. Ltd. - Surat** as teamwork for **M/s. Gujarat Fluorochemicals Ltd. - Dahej.** The material in it reflects PROSAFE's best judgment and experience of the Audit team members as in the light of the information available to them at the time of preparation.

However, as PROSAFE cannot control the conditions under which this report may be used, **PROSAFE will not be responsible** for damages of any nature resulting from use of or reliance upon this report. Therefore, process & engineering concepts shall be applied for implementing the recommendation. Prosafe hereby expressly disclaims any liability or responsibility for loss or damage resulting from the use of PROSAFE's Safety Audit Report.

AUDIT CERTIFICATE

We are pleased to certify that this Occupational Safety and Health Audit of M/s. Gujarat Fluorochemicals Ltd. - Dahej has been conducted by us on **16th, 17th & 18th December 2024.**

Safety Audit is a legal requirement u/r 12 – C, 68 – O and 68 – J of the Gujarat Factories Rules - 1963 and Rule 10 of the Manufacture, Storage and Import of Hazardous Chemicals Rules - 1989. This audit is carried out as per requirements of the above statutes and as per guidelines given in IS 14489: 2018.

We have sincerely tried to adhere to the terminology and methodology of IS 14489: 2018 and gone through the maximum details as suggested in Annexure B & C thereof. The Observations and Recommendations are based on information supplied to us by the company and our plant visits. The detailed observation report is attached.

The Executive Summary is given in the beginning to highlight the significant observations our audit report. We hope the compliance of Audit points suggested in this report will make the company more safe and healthy.

The Third Party Safety Audit is valid for **2 Years** as per the Gujarat Factories Rules 1963 & it is valid for **1 Year** as per the MSIHC Rules 1989; hence next Audit will be due in **December 2025.**

01.02.2025 **PROSAFE PROCESS ENGINEERING PVT. LTD.**

SURAT **AUTHORIZED SIGNATORY**

Areas of Audit

Sr. No.	Plant Name
1.	TFE-1 Plant
2.	R-125 Plant
3.	Electrical Distribution system
4.	PTPTFE Plant
5.	Canteen
6.	Warehouses
7.	Stores
8.	Fire water pump house
9.	Common utility
10.	GFRC
11.	Laboratories

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EXECUTIVE SUMMARY

The Executive Summary is intended for the overview of the Safety Management System & status of the overall performance. The following significant are the finding where immediate attention will help improving performance. This will help the top management to take cognizance for the forward path & necessary guidance to the line management.

1. Safety Audit is carried out to ensure the sustenance of industrial safety, occupational health and environmental protection within the factory premises. It is based on the statutory requirements and **IS 14489:2018**. It was carried out during our visit from **16.12.2024 to 18.12.2024**. It includes examination of relevant records, observation of 512 questions as per IS annexure, Opening and Closing meetings with HODs, discussion with many plant people and workers and actual shop floor inspection of the plant and machinery.

2. Our Audit approach is not only technical but techno-legal. Engineering aspect is also seen through the law of the land i.e. our statutory engineering and other requirements.

STRENGTH- HSE MANAGEMENT: -

1. Strong Management's commitment towards safety system was visible.
2. Highly cooperative, transparent and committed staff.
3. Very good Housekeeping.
4. Safety performance board was displayed at the gate entry.
5. An excellent program of monitoring of critical pipe and static equipment health was in place.
6. Compatibility chart was available at Chemical stores.
7. No accident / no dangerous occurrence in the TFE-1 plant.
8. OHC: Well-equipped OHC with couple of fulltime doctors with staff, ambulance facility, AED m/c, chemical burn kits, antidotes, snake anti venom injections available.
9. PT/PTFE Plant: 360° Machine guarding placed to the moving parts of the equipments/ pumps.
10. PT/PTFE Plant: 30 mA ELCB provided in the required areas of electrical fittings.
11. PT/PTFE Plant: Ovens are interlocked with separate PLC system.
12. PT/PTFE Plant: Fire Hose boxes equipped with triple purpose branches.
13. PT/PTFE Plant: In process CO generated being incinerated in totality.
14. R-125 Plant: Dump/ Blow down tank provided to the R-125 pressure reaction system.
15. R-125 Plant: Flange guards provided to the flange joints of the hazardous chemical lines.
16. R-125 Plant: Emergency lights provided in the plant areas.

1.0 AUDIT OBJECTIVES AND SCOPE

1.1 AUDIT OBJECTIVES

Following objectives were considered in focus while conducting the audit:

- To provide the Auditee with an opportunity to assess its own OH&S system against OH&S system standard and identify areas for improvement.
- To carry out a systematic, critical appraisal of all potential hazards involving personnel, plant, services, operations and procedures.
- To ensure that OH&S system fully satisfy the legal requirements and those of the company's written policies, objectives and progress.
- To assess the effectiveness of the OH&S programs.

1.2 AUDIT SCOPE

Following are the key focus area while carrying out OH&S Audit;

- Organizational activity performed by company employees, contractors, transporters and other agencies within the factory premises.
- Applicable (Relevant) legal requirements pertaining to OH&S
- Management commitment and leadership
- System for keeping department safe
- Plans for compliance with routine observation and suggestion
- Commitment of line function responsibility for safety
- Accident and incident Investigation and analysis
- Emergency preparedness plan and its Mock drills
- Prioritization of risk for the department and action plan
- Safety Management of Contract workers
- Training and Performance
- Hazardous Chemical Safety Management
- 34 Elements of IS 14489 “Code of Practice On OHS Audit”

The Audit Scope was completed by assessing the relevant procedures, interaction with people and verification records and documentation.

2.0 AUDIT PROCESS AND APPROACH

2.1 AUDIT PLAN

Following Audit Plan has been finalized after consultation with the client and communicated to all concerned.

1. Identification of the factory is given in Para 3.1. Almost all key areas of manufacturing including storages and their safety management system were included in the audit plan.
2. Audit team including '**Management Representation'** is decided and stated in Para 2.
3. Audit objectives and scope are stated in Para 1.1 and 1.2.
4. Schedule for audit activities, meetings, plant visits and interaction with employees, checking of statutory records and documents were mutually decided with the management.
5. It was also decided to use Annexure – B & C of IS: 14489; other relevant Indian Standards and provisions of the Factories Act & Rules as a guideline. Requirements of other Safety Acts & Rules were also considered. The company policy, manual and systems were also considered as other reference documents.

2.2 AUDIT TEAM

This Audit is carried out as per IS 14489: 2018 and requirements under the Factories Act - 1948, The Gujarat Factories Rules - 1963 and other safety statutes.

We have deputed suitably Qualified and Experienced Auditors to perform this audit as under:

No.	Name	Qualifications	Experience
1.	2.	3.	4.
1.	Mr. R. J. Lakhtaria	B. E. Mechanical	> 35 Years
2.	Mr. H. L. Patel	B. E. Electrical	> 35 Years
3.	Mr. R. V. Thakur	B. Sc. + ADIS	> 30 Years
4.	Mr. Smit Parekh	B. E. Chemical	> 2.5 Years

2.3 OPENING MEETING

An opening meeting was organized in **M/s. Gujarat Fluorochemicals Ltd. - Dahej** on **16.12.2024** for the purpose of introduction of Audit Team Members and also to appraise the scope and methodology of the audit, informing the Auditee about requirements of the necessary documents, records and other relevant information.

In this opening meeting:

- Members of the Auditor and Auditee teams were introduced.
- Audit objectives and scope, plan and purpose of necessary documents and records were explained and discussed.
- A short summary of the methods and procedures was explained.
- Official communication links between the Auditee and auditors were established.
- Availability of the resources and facilities needed by us were confirmed.
- A schedule of plant visits was decided.
- The areas of audit were suggested and discussed.
- Date and time of the closing meeting and interim meetings were discussed.
- Queries of the management were replied.

2.4 DOCUMENTS AND RECORDS

Following documents and records were required from the Auditee for the purpose of investigation, necessary information and evidence to examine their OS&H systems.

1. Annexure B & C of IS: 14489.
2. Statutory Forms under the Factories Act & Rules and documents under the Environment Protection Act & Rules.
3. Formats and check list used by the organization as per their OH & S requirement e.g. Work Permit Systems, Safe Operating Procedures, specific formats etc.
4. Notices displayed in the factory premises.
5. Evidences collected from field visits, interrogation with the workers and supervisors, and information of physical observations, measurements and records etc.

3.0 BRIEF PROCESS AND HAZARD CONTROL

3.1 INTRODUCTION OF THE FACTORY

NO.	PARTICULARS			
1.	Full Name & Address of the Factory	M/s. GUJARAT FLUOROCHEMICALS LTD. Plot No. 12/A, G.I.D.C. Dahej, Tal. – Vagra, Dist. – Bharuch - 392 130 (Gujarat).		
	Phone No.	02641 - 618031		
2.	Full Name & Address of the Occupier	**Mr. Sanath Kumar** Plot No. 12/A, G.I.D.C. Dahej, Tal. – Vagra, Dist. – Bharuch - 392 130 (Gujarat).		
	Phone No.	02641 - 618003		
3.	Full Name & Address of the Manager	**Dr. Sunil Bhatt** Plot No. 12/A, G.I.D.C. Dahej, Tal. – Vagra, Dist. – Bharuch - 392 130 (Gujarat).		
	Phone No.	02641 - 618005		
4.	Process	As per chapter 3.4		
5.	Product	As per chapter 3.3.1		
6.	**Man Power (including Worker, Trainees, Apprentice)**			
	Name of Shift	**Male**	**Female**	**Total**
a.	General **(G)**	453	22	475
b.	First **(A)**	357	00	357
c.	Second **(B)**	337	01	338
d.	Third **(C)**	219	00	219
TOTAL		**1366**	**23**	**1389**

NO.	PARTICULARS	
7.	Land Area	422343 Sq. meters
8.	**The Surrounding of the unit can be described as below: -**	
	East Side	GIDC Road & Opal Company
	West Side	ISGEC Company
	North Side	NOCIL, DNL & DPL Company
	South Side	Ambheta Village
9.	**Brief Detail of Fire Prevention & Protection System:**	
	Fire Hydrant Points	322 Nos.
	Hoses (15 Mtr.)	686 Nos.
	Hose Boxes	317 Nos.
	Hose Reels	03 Nos.
	Foam/ Water Monitor	34 Nos.
	Sprinkler System Locations	MVWS: 1) Methanol Tank Farm 2) VDF Tank Farm 3) R-142b (Old & New) Tank Farm 4) Cl2 Bullet Area 5) AHF Tank Farm
	Sand Buckets	161 Nos.
	Fire Water Tank Capacity	2500 KL: 2 Nos. of water lagoon at Pump House - A 508 KL: 3 Nos. of FRP Tank Pump House - B
	Fire Pump Details	**Pump House - A** **1. Electric Main Pump - 3 Nos.**

NO.	PARTICULARS	
		• Capacity: 273 m^3/Hr. **2. Jockey Pump - 2 Nos.** • Capacity: 78 m^3/Hr. **3. Diesel Pump - 1 No.** • Capacity: 273 m^3/Hr. **Pump House - B** **1. Electric Main Pump - 2 Nos.** • Capacity: 273 m^3/Hr. **2. Jockey Pump - 1 No.** • Capacity: 78 m^3/Hr. **3. Diesel Pump - 1 No.** • Capacity: 273 m^3/Hr.
	List of Fire Extinguisher's	TOTAL – 1336 Nos.
	Fire Tender Details	Water Tank: 3000 liters Foam Tank: 1000 liters DCP System: 500Kg capacity Pump capacity: 2250 LPM at 7-8.5 kg/cm2 at suction lift of 7 meters.
10.	Month & Year of Previous Audit	December 2023
11.	Details of Last Mock Drill	**1.** Date: 10:12:2024 **2.** Time: 11:22 hrs. **3.** Scenario: Fluorine Leakage from fluorine shed
12.	HSE Training plan & Training records for past 2 Year	No. of Training Sessions - 53 No. of Participants - 2922 Total Man-hours - 2923

LIST OF FIRE EXTINGUISHER'S			
NO.	**TYPE OF EXTINGUISHER**	**CAPACITY**	**QUANTITY**
1.	**2.**	**3.**	**4.**
1.	CO_2	4.5 KG	450
		6.8 KG	5
2.	ABC/ DCP	2 KG	159
		6 KG	692
		10 KG	12
		25 KG	1
3.	Mechanical Foam	9 Liters	1
		50 Liters	10
4.	Mechanical Foam Trolley	100 Liters	6
TOTAL			**1336**

3.2 COMPANY PROFILE

An ISO 9001:2015, ISO 14001:2015, ISO 45001:2018 and SA 8000:2014 certified organization, GFL is a leading producer of Fluoropolymers, Fluorospecialities, Refrigerants and Chemicals for applications in varied industries. GFL derives its strength from expertise in Fluorine Chemistry, vertical integration from natural minerals to Fluoropolymers and strong R&D enabling it to provide one of the best quality products meeting all regulatory compliances, to our clientele globally.

The year 1989 marked commencement of Company's commercial operations with India's largest Refrigerant manufacturing unit at Ranjitnagar, Gujarat, India. The site was further expanded to produce Fluorospeciality products catering to the growing demands in global agriculture and pharmaceutical industry. Foraying into new avenues in 2007, with one of the world's most integrated facilities at Dahej, Gujarat, India, GFL now has a diverse portfolio of Fluroropolymers comprising PTFE, PFA, FEP, FKM, PVDF and Fluoropolymer Additives.

With three manufacturing facilities in India, a captive Fluorspar mine in Morocco, offices and warehouses in Europe and USA, and a marketing network spread across the world, GFL is one of the established players in Fluoropolymers and Fluoro specialities markets.

Our Sustainability goals are interwoven with the way we do business all along our value chain. The company is signatory to the United Nations Global Compact (UNGC), and is a member of the Indian Chemical Council (ICC). Our focus on Health, Safety and Environment is reflected in the wellbeing and safety of our people. All-inclusive efforts towards sustainability at various facets make us long-term partners for our customers across geographies..

3.3 PRODUCTS, RAW MATERIALS, HAZARDS & CONTROLS

3.3.1 LIST OF PRODUCTS: -

Sr. No.	Name of Products	Quantity (MT/ Month)		
		Existing	Proposed	Total (After change in Product Mix)
1.	2.	3.	4.	5.
1.	PolytetraFluoro Ethylene (PTFE)#	1800	0	1800
2.	Ethyl Tetra Fluoro Ethyl Ether (ETFEE)	400	-200	200
3.	Carbon Dioxide-Food grade gas	2267	-2267	0
4.	Carbon Dioxide-Dry Ice	533	-533	0
5.	Pentafluoroethane (HFC - 125)	417	233	650
6.	Chloroform	10090	0	10090
7.	Methylene Dichloride (MDC)	10090	0	10090
8.	Carbon Tetrachloride (CTC)**	1440	0	1440
9.	Sulphuric Acid (70%- 88%)	713	0	713
10.	Hydrochloric Acid (31 % +/- 1%)	37992	0	37992
11.	Caustic Soda (Dry Basis)	15500	0	15500
12.	Chlorine Dry Basis	13167	0	13167
13.	Hydrogen	464	0	464
14.	Hydrochloric Acid (31% + 1 %)	357	0	357
15.	Sodium hypochlorite (10% chlorine) caustic	132	0	132
16.	Calcium Chloride	4750	0	4750

Sr. No.	Name of Products	Quantity (MT/ Month)		
		Existing	Proposed	Total (After change in Product Mix)
1.	2.	3.	4.	5.
17.	Dilute HF (20 %)	1000	0	1000
18.	High Boiler of Chloromethane	200	0	200
19.	HexaFluoro Propylene (HFP)	300	0	300
20.	Tetrafluoro Dimethyl Amine (TFE DMA)	90	-45	45
21.	DichloroFluoromethane (HCFC-21/R-21)	230	0	230
22.	Dichloropentafluoro Propane (HCFC-225)	415	-5	410
23.	Methyl Tetra Fluoro Ethyl Ether (MTFEE) Trifluoromethane	83	-73	10
24.	Tri fluoromethane	21	0	21
25.	1,1,3Trichlorotetrafluoropropane (HCFC 224ca)	25	0	25
26.	Gypsum	12768	0	12768
27.	Fluoro Elastomers (FKM)*	300	100	400
28.	Perfluoro Alkoxy (PM)*	200	125	325
29.	Polyvenylidene Fluoride (PVDF)*	250	-100	150
30.	Fluorinated Ethylene Propylene (PEP)*	250	-75	175
31.	Intermediate Vinylidene Fluoride (VDF)	84	0	84
32.	Hydrofluosilicic Acid (20%)	200	0	200
33.	2,6-Dichloro-4-Trifluoro Methyl Aniline (DCTFMA)	65	0	65
34.	Trifluoro Methyl Aniline (TFMA)	20	-19	1

Sr. No.	Name of Products	Quantity (MT/ Month)		
		Existing	Proposed	Total (After change in Product Mix)
1.	2.	3.	4.	5.
35.	Lodurate	1	0	1
36.	Tetra Fluoro Beta Sulfone	25	-25	0
37.	Tetra Fluoro Ethyl Ether (Propyl, butyl, TF Propyl)	80	-55	25
38.	Di Chloro Tetra Fluoroethoxy aniline	10	-10	0
39.	I-SAN	20	0	20
40.	Poly Chloro Tri fluoro ethylene (PCTFE)	4	0	4
41.	C4 to C34 Surfactant (Non-fluorinated)	10	0	10
42.	R&D Products	10	0	10
43.	Mono Chloro Difluoro Methane (R-22)	1100	0	1100
44.	Proton Exchange Membrane incl Monomer	0	10	10
Total		117873	-2939	114934
45.	Gas Based COGEN Power	54.5 MW	0	54.5 MW
46.	Coal Base COGEN Power			
47.	Gas Base CCGT Power	37 MW	0	37 MW
Total		91.5 MW	0	91.5 MW

3.3.2 LIST OF MAJOR RAW MATERIALS & PRODUCTS

No.	Name of the Chemical	State	Stored In	Total Storage Capacity	Actual Qty. Stored	Hazards	Control Measures Provided
1.	2.	3.	4.	5.	6.	7.	8.
RAW MATERIALS							
1.	Liquid Chlorine	Liquid	Bullet	315 M^3 (105 M^3 x 3)	179 M^3	Toxic release	• Steel bullet • Standby bullet • Fencing • Electric connection – flame proof as per IS – 2148 • Waste gas scrubber system • Online breathing air pipeline with air mask assembly • CASCADE Trolley • Standby breathing air cylinders • 4 Nos. DCP type fire extinguisher • Water sprinkler system • Fire hydrant system • Chlorine Gas Detectors • Cautionary boards displayed

No.	Name of the Chemical	State	Stored In	Total Storage Capacity	Actual Qty. Stored	Hazards	Control Measures Provided
1.	2.	3.	4.	5.	6.	7.	8.
2.	Methanol	Liquid	Tank	250 MT (50 MT x 2) (150 MT x 1)	213 MT	Highly Flammable, Toxic release	• Fencing • Electric connection – flame proof as per IS – 2148 • Online breathing air pipeline with air mask assembly • Standby breathing air cylinders • 4 Nos. DCP type fire extinguisher • Water sprinkler system • Fire hydrant system • Foam type fire extinguishers and Sand buckets • Flammable Gas Detectors • Cautionary boards displayed
3.	Sulphuric acid (98%)	Liquid	Tank	608 M^3 (100 M^3x 3) (30.5 M^3 x 1)	517 M^3	Corrosive	• Dyke wall • Scrubber system • Safety shower • SCBA Set

No.	Name of the Chemical	State	Stored In	Total Storage Capacity	Actual Qty. Stored	Hazards	Control Measures Provided
1.	2.	3.	4.	5.	6.	7.	8.
							• Airline mask • Fire Hydrant System • Fire Extinguishers
4.	Sulphuric acid (88%)	Liquid	Tank	360 M^3 (100 m3 x 2)	306 M^3	Corrosive	• Dyke wall • Scrubber system • Safety shower • SCBA Set • Airline mask • Fire Hydrant System • Fire Extinguishers
5.	Hydrochloric acid (31%)	Liquid	Tank	260 M^3 (50 M^3 x 4) (26 M^3 x 1)	221 M^3	Corrosive	• Dyke wall • Scrubber system • Safety shower • SCBA Set • Fire Hydrant System • Fire Extinguishers

No.	Name of the Chemical	State	Stored In	Total Storage Capacity	Actual Qty. Stored	Hazards	Control Measures Provided
1.	2.	3.	4.	5.	6.	7.	8.
6.	Methylene Dichloride	Liquid	Closed cylindrical vertical container	375 M^3 (150 M^3 x 2) (75 M^3 x 1)	319 M^3	Irritant	• Dyke wall • Safety shower • SCBA Set • Water sprinkler system • Online Airline mask • Fire Hydrant System • Fire Extinguishers
7.	Chloroform	Liquid	Tank	237 M^3 (100 M^3 x 1) (60 M^3 x 1)	201 M^3	Toxic release, Irritant	• Dyke wall • Safety shower • SCBA Set • Water sprinkler system • Online Airline mask • Fire Hydrant System • Fire Extinguishers
8.	Carbon Tetrachloride (CTC)	Liquid	Tank	268 M^3 (100 M^3 x 1) (75 M^3 x 1)	228 M^3	Toxic release	• Dyke wall • Safety shower • SCBA Set

No.	Name of the Chemical	State	Stored In	Total Storage Capacity	Actual Qty. Stored	Hazards	Control Measures Provided
1.	2.	3.	4.	5.	6.	7.	8.
							• Water sprinkler system • Online Airline mask • Fire Hydrant System • Fire Extinguishers
9.	Natural Gas (NG)	Gas	190000 SCM/D, 2.45 Bar, 30-40°C No Storage in the company premises.			Extremely Flammable	• Earthing & bonding provided in NG pipelines • Fire Hydrant System • Fire Extinguishers • SCBA Set
10.	Coal	Solid	Coal Storage Yard	15000 MT	13500 MT	Combustible	• Fire Hydrant System • Fire Extinguishers • SCBA Set • Safety shower
11.	Hydrogen Gas	Gas	No Storage in the company premises. transferred to Hydrogen Bank 100000 Nm^3/Day			Extremely Flammable	• Earthing & bonding provided in Hydrogen gas pipelines • Fire Hydrant System • Fire Extinguishers

No.	Name of the Chemical	State	Stored In	Total Storage Capacity	Actual Qty. Stored	Hazards	Control Measures Provided
1.	2.	3.	4.	5.	6.	7.	8.
							• SCBA Set
12.	Caustic Lye (32%)	Liquid	Tank	310 m^3 (117.5 m^3 x 2)	264 m^3	Corrosive	• Dyke wall • Safety shower • SCBA Set • Fire Hydrant System • Fire Extinguishers
13.	Caustic Lye (48%)	Liquid	Tank	3576 m^3 (400 m^3 x 3) (1200 m^3 x 1)	3040 m^3	Corrosive	• Dyke wall • Safety shower • SCBA Set • Fire Hydrant System • Fire Extinguishers
14.	Anhydrous Hydrofluoric Acid (AHF)	Liquid	Bullet	18.07 MT	18 MT	Corrosive, Irritan	• Dyke wall • Centralized Scrubber system • Safety shower • SCBA Set • Breathing air compressor • Positive pressure control room

No.	Name of the Chemical	State	Stored In	Total Storage Capacity	Actual Qty. Stored	Hazards	Control Measures Provided
1.	2.	3.	4.	5.	6.	7.	8.
							• Emergency dump tank • First Aid Kit • Fire Hydrant System • Fire Extinguishers
15.	Dilute Hydrofluoric Acid (20 % DHF)	Liquid	Tank	80 MT	68 MT	Corrosive, Irritan	• Back end Scrubber system • Safety shower • SCBA Set • Breathing air compressor • Positive pressure control room • First Aid Kit • Fire Hydrant System • Fire Extinguishers
16.	Fluorosilicic Acid (H_2SiF_6 30 %)	Liquid	Tank	100 MT	85 MT	Corrosive, Toxic	• Dyke wall • Centralized Scrubber system • Back end Scrubber system • Safety shower • SCBA Set

No.	Name of the Chemical	State	Stored In	Total Storage Capacity	Actual Qty. Stored	Hazards	Control Measures Provided
1.	2.	3.	4.	5.	6.	7.	8.
							• Breathing air compressor • Positive pressure control room • Emergency dump tank • First Aid Kit • Fire Hydrant System • Fire Extinguishers
17.	Vinylidine Fluoride (VDF)	Gas	Bullet	39 m^3	39 m^3	Extremely Flammable	• Safety shower • SCBA Set • Cartridge Mask • Full body PVC suit • PVC hand gloves • Safety gum boot • Breathing air compressor • Positive pressure control room • Emergency dump tank • First Aid Kit • Fire Hydrant System

No.	Name of the Chemical	State	Stored In	Total Storage Capacity	Actual Qty. Stored	Hazards	Control Measures Provided
1.	2.	3.	4.	5.	6.	7.	8.
							• Fire Extinguishers
18.	Oleum	Liquid	Vertical cylindrical storage tank	200 KL (100 KL x 2)	170 KL	Corrosive	• Level transmitter & Level switch with interlock of high level with pump • Empty spare tank • Safety shower • SCBA Set • Positive pressure control room • Chemical suit • Fire Hydrant System • Fire Extinguishers
19.	R-142-B	Gas	Bullet	79 KL	79 KL	Extremely Flammable	• Safety shower • SCBA Set • Water curtain system • Airline Mask • Fire Hydrant System • Fire Extinguishers

3.4 PROCESS HAZARD & CONTROLS

(A) PROCESS DESCRIPTION

A. Chlor-Alkali Plant

This plant is designed to produce Liquid Chlorine of 337 MT / Day and Caustic Soda of 11400 MT / Month based on state of the artIon-exchange membrane cell process developed by Asahi, Japan. The Chlor-Alkali plant is designed to produce 380 TPD caustic soda based on the Ion Exchange Membrane Technology. In the electrolysis process, hydrogen gas and caustic soda are produced in the catholyte compartments. Chlorine gas is produced in the anolyte compartments. Hydrochloric Acid is manufactured from Cl2 and H2 gas generated in the electrolysis process, in hydrochloric acid synthesis unit. The process consists of following sections:

1. Primary brine purification,
2. Secondary brine purification,
3. Electrolysis,
4. De-Chlorination,
5. Caustic Soda Evaporation,
6. Cl2 gas washing &cooling, drying,
7. Cl2 gas compression and liquefaction,
8. Cl2 absorption,
9. H2 gas washing
10 Chlorine Synthesis

The Chlor-Alkali Plant is controlled by DCS to provide an Integrated Plant Control with following associations:

i. Distributed Control System (DCS)
ii. Safety Interlock System
iii Remote Control Panel for rectifiers
v. Instrument Panel with monitoring and alarm modules, recorder for Cl2 and H2 gas Pressure /differential pressure

Brine solution is used as feedstock, and it is purified in order to remove impurities before sending to Electrolysis Unit. Raw salt is dissolved with return brine solution from electrolyzer, and it is sent to Reactor with sodium carbonate, barium carbonate and caustic soda to exchange the calcium, magnesium and other multivalent ions

present in the raw brine. After this reaction, brine solution flows into clarifier to settle suspended solids and the clear liquid is sent to Pre-coat type ceramic filters and Ion-exchange column for further purification. Electrolysis Unit is composed of Electrolyzer, Anolyte and Catholyte circulation facilities. Each electrolyzer of 142 cells is designed to produce 385 ton/day of Caustic Soda as 100% at the current density of 6.0 kA/m2. The purified brine is supplied to anolyte compartment, where the chlorine gas (Cl2) is generated and then sent it to Catholyte compartment, where hydrogen gas (H2) and Caustic Soda are produced. Wet Cl2 undergoes washing, Cooling, Drying and Compression processes and finally stored in a Liquid Cl2 Storage tank by Liquefaction process. Wet H2 gas from the Electrolysis is sent to H2 gas Scrubber. The depleted brine from the electrolysis section is pumped to De-chlorination Tank, which is kept under vacuum by Steam Ejector. The dissolved Cl2 is stripped together with water vapor and is cooled in De- chlorination Cooler. There still remains a small amount of free Cl2, which is removed by adding Sodium Sulfite solution. Then, the brine is sent to Primary Brine Purification section. Caustic soda solution from Electrolyzer is fed to Caustic Evaporation Unit for purification. Various raw materials required such as NaCl, Flocculent, Sodium Carbonate, Barium Carbonate, Hydrochloric Acid and Sulfuric Acid are stored in separate storage areas. Utilities such as Steam, Nitrogen, raw water and DM water are supplied from the main utility area. Chilled water and cooling water requirement is met by dedicated chilled water and cooling water plants located in the caustic soda plant area. Chilled water consumption in the plant is about 300 m3/hr. and plant capacity is 250 TR. Cooling water consumption in the plant is approximately 2000 m3/hr.

B. Chloromethane Plant

The CMS Plant is designed to produce 310 TPD of Chloromethane which are Methylene Dichloride, Chloroform and Carbon tetrachloride. The process is carried out in two stages:

Hydro-chlorination in which Methanol gas reacts with HCl gas to produce Methyl Chloride (exothermic reaction) and Therma Chlorination of Methyl Chloride with Chlorine to produce Methylene Dichloride, Chloroform and Carbon Tetrachloride as per the requirement by altering the feed ratios. The main product produced is Chloroform and this is fed as raw material to the existing R-22 Manufacturing. The process consists of following sections:

i. Hydro Chlorin section Unit.

ii. Chlorination Unit.
iii. Product Rectification Unit.
iv. Hydrogen Chloride Absorption Unit.
v. Regeneration and Drying Unit.
vi. Acid and Alkali storage Unit.
vii. Refrigeration Unit.
viii. Steam and Condensate Recovery system.

The CMS Plant is controlled by Distributed Control System to provide an Integrated Plant Control with following:
1. Safety Interlock System
2. Remote Control Panel for rectifiers.

The feedstock Methanol (CH3OH) and Hydrochloride (HCl) react to produce Methyl Chloride in Hydro chlorination unit. This product is sent to Chlorination unit with Chlorine gas (Cl2). Both of them undergo thermal chlorination and produce a mixture of Dichloromethane, Chloroform (CHCl3) and Carbon Tetrachloride (CCl4). This product mixture is rectified in Rectification unit and dried by azeotropic drying. Most of the by-product HCl from chlorination unit is again sent to hydro chlorination unit and the excess HCl is absorbed in HCl absorption unit. This absorbed HCl and process water formed concentrated hydrochloric acid, which is then stripped in the organic stripper to remove organic matters.

The off-gas containing HCl and Cl2 are neutralized with NaOH and water. The spent NaOH containing Chloromethane (CMS) mixtures and off-specific CMS are collected and re generated through CMS dryer and sent it to product rectification unit. According to process requirements, exhaust condenser in the hydro chlorination unit, chlorination unit and refrigeration unit adopt R-22 evaporation to exchange heat with the process fluids. In addition to that, storage tanks receive and store concentrated sulfuric acid, dilute NaOH and dilute H2SO4 as needed in major process units.

Steam and Condensate recovery system is also provided to recover steam condensate from the plant. Various raw materials required such as Methanol, HCL, NaOH and Sulfuric Acid are stored in separate storage areas. Utilities such as Steam, Nitrogen, raw water and DM water are supplied from the main utility area.

C. TFE, PTFE and PT- PTFE Plants

This plant is to manufacture TFE, PTFE, PT-PTFE and DPTFE using captive available R 22 of about 112 MT/day as the feed stock for the production of TFE and to produce PTFE resin. The annual production capacity on the basis of 300 working days per year is TFE of 7,680 TPA and PTFE of 1650 MT/Month.

The PTFE plant is designed to produce 1650 MT/ Month of Poly Tetra Fluoro Ethylene i.e., suspended middle grain and fine grain PTFE resin. The process is mainly carried out in two stages:

i. Thermal cracking of R-22 with over-heated steam to produced TFE.

ii. Polymerization of TFE with De-ionized water and reduction – oxidizing system to produce PTFE.

The process consists of following sections:

1. TFE monomer metering.
2. Suspension polymerization.
3. Crushing, washing and drying of PTFE.
4. Air- jet pulverization process.
5. Packing and storage.

The PTFE Plant is controlled by DCS to provide an Integrated Plant Control with following associations:

1. Distributed Control System
2. Safety Interlock System

Fresh and recycled Chlorodifluoromethane (R22) is mixed in a vessel and enters into Steam heating furnace and to the Reactor for cracking. Cracked gas is composed of C2F4, HCl, un- reacted R22, excess steam and traces of other cracked products. They enter into a Graphite condenser after rapid cooling in a Quencher. The excess steam and HCl are condensed to form dilute hydrochloric acid and transferred to either neutralization chamber or storage vessel. Uncondensed cracked gas is neutralized and then sent to a buffer tank.

The cracked gas enters into the three-stage compressor unit through a buffer tank, cooler and refrigeration dryer to remove excess moisture. The dry process gas is sent

to rectification units for further purification of TFE monomer after de-oxidation process and sent to storage tank through condenser. The un-reacted R 22 from rectification units is recycled to the reaction system. Liquid TFE monomer is sent to Polymerization reactor with de-ionized water after heating, vaporization and compression. The PTFE polymer with mother liquor from reactor is sent for crushing, washing by fresh de-ionized water and drying. Further, PTFE resin is sent, to and dried in the hot air blowing and cold air blowing system and finally it is separated according to its size in a cyclone separator.

post treated PTFE (PT-PTFE) is obtained from following methods depending upon customer requirement. The middle size PTFE resin is fed to air jet mill continuously and smashed by accelerated impact and obtained PT- PTFE's grain size is varying from 10 to100 Microns. Dry PTFE powder is treated in Heating Ovens at various temperatures to get desired quality of PTFE as per Market requirement. Dry powder is treated in Reactor along with water and Perchloro-ethylene at various temperatures to get the properties of free-flowing PTFE powder.

Various raw materials required are TFE, Aqueous alkali, Disodium hydrogen phosphate, Ammonium per sulfate, Sodium bisulfate, Ferrous sulfate, De-ionized water and Silica gel. Utilities such as N2, Instrument Air and Process Air, cooling medium (-15˚C CaCl2 Brine, - 35 ˚C CaCl2 Brine, -5 ˚C aqueous Ethylene Glycol), Saturated steam, Electricity 3- phase and Compressed air are supplied from the main utility area.

D. Captive Power Plant

GFL has set up a 26 MW Co-generation plant, which represents the combined production of heat and power through a c

This plant is designed to produce electric power for captive power requirement, process steam through waste heat recovery boilers using hot flue gases coming out of the gas turbines. In addition to that the plant has been designed to operate its gas turbines with augmented output by means of reducing the sensible heat and partially reducing the moisture in the combustion air through the Vapor Absorption Machines (VAM) of 330 TR capacity driven by the hot engine jacket cooling water. Fuel is natural gas with Methane number greater than or equal to 70.

The minimum and maximum gas pressures for operation are 3.5 and 6 bar (g), respectively. Steam is produced at the net rate of 195000 kg per hour and at a pressure of 12.0 kg/cm2 (g) and temperature of 191°C. Makeup water is added at 65°C and 4 kg/cm2 (g).

E. A & H Plant

Process Description of HCFC R-22 for TFE feedstock

Anhydrous Hydrofluoric Acid, for captive consumption, is manufactured by reacting Fluorspar with a mixture of Sulphuric Acid and Oleum. Wet Fluorspar is fed to the inlet of Flash Dryer. The dry Fluorspar from Cyclone is fed to the Rotary Kiln through the Storage Silo. The Fluorspar, after drying, is fed to the Rotary Kiln along with a mixture of Sulphuric Acid and Oleum, to produce AHF and By-product Gypsum (CaS04) as per the following reaction:

Heat

CaF2 (5) +H2S04(1)> 2 HF(g) + CaS04(s)

The reaction is endothermic and there is no possibility of any run-away reaction.
The Rotary Kiln is indirectly heated by hot flue gases. The Gypsum from the Kiln is neutralized with Lime and discharged as By-product.

The HF vapor is passed through the Kiln Column. The clean HF from the Kiln Column is condensed in HF condensers by means of Refrigeration. The crude condensed HF liquid is fed to the Distillation Columns through Crude HF Storage Tank. Pure AHF is withdrawn and sent to receiving tank after due Analysis.

The entire HF Plant is kept under negative pressure and there is no possibility of leakages of HF from the equipment to the atmosphere.

Raw Materials Anhydrous Hydrogen Fluoride (AHF) and Organic CHCI3 for R-22) are fed to Reactor (01). The Reactor contains special Penta chloride Catalyst which is used to catalyze the reaction between. AHF and Organic to produce Refrigerant gas as per the following reactions:

CHCI3 (I) +2HF(I) >CHCIF2 (g) + 2HCI (g)(R22)

The Crude Refrigerant gases from Reactor enter the Stripper (02) to condense and return unconverted Reactants. CHCl3 to the Reactor.

From Stripper, Crude gas mixture enters HCI Distillation Column (03). Top product of Distillation Column enters HCI Absorption Unit, which consists of Alumina Towers (07, 08), HCI Absorber (09) and Tail Tower (10). Here, HCI is generated by counter current absorption with water. The bottom product of the Distillation Column (03) enters exchanger where it is mixed with organic and is finally collected into Phase Separator (04). The top layer of the Phase Separator (04) is collected into the AHF Storage Tank (05) and is finally re-fed into the Reactor (01). The bottom layer of the Phase Separator enters Heavies Recovery Column (06). The bottom product of the Heavies Recovery Column (06) is stored into Heavies Tank and is finally re-fed into Reactor (01). The top product of the Heavies Recovery Column enters HF Absorption Column (11) where traces of HF are absorbed into Sulphuric Acid and output of the HF Absorption Column enters into Alkali Towers (12, 13) where the Crude gas is scrubbed with Caustic Soda Trisodium Phosphate. The Crude Gases are then dried in Acid Drying Towers (14, 15) where Moisture, is absorbed by circulating Sulphuric Acid, The bottom product of Non condensable Column enters 1st Distillation Column (20), where R-22 is withdrawn from the top as Final Product, bottom from the Column (20), which mainly contains High Boilers such as R- 21 and CHCl3 is recycled to the Reactor (01), The Finished Product Refrigerant Gases withdrawn from respective Column tops are then sent to the Daily Storage Tanks. After duly approval of the Quality, the R-22 is sent to final storage for TFE feed stock.

The 32 % HCI obtained from the Absorption Unit is taken to the Storage Tank from where it is sold to Customers. The Spent Liquor from Alkali Tower is taken to Effluent Treatment Plant, for suitable treatment and disposal. The Spent Sulphuric Add from Acid Drying Tower (14, 15) is mixed with Oleum to make up the strength (11) is stored Into Sulphuric Storage Tank T- 3107A/B and is finally fed to the Kiln.
Equipment reference no. is mentioned in block diagram of Plant-H.

F. Recovery Plant -1

In the manufacturing of PTFE, TFE is polymerized in DI water with the help of Initiators. Fluoro surfactant is present as the dispersing medium. This Flour surfactant remains in the Latex coming from the reactor. This Fluoro surfactant has to be removed from the Product before it is sent to the market. For this following process is followed.

a. First secondary surfactant (Tegretol) is mixed in this Latex. So that the product becomes stable. This Tegretol is Non-Fluorinated surfactant and can remain in the product as a stabilizer for the product

b. So, after Adding this secondary surfactant the primary surfactant is removed by passing this liquid through ion exchange columns. Where the primary surfactant is captured by ion exchange resin and final product without Primary surfactant goes for further concentration and packaging of the product.

c. Now the resin contains this primary surfactant which has to be removed and to be recycled back to the process.

d. For removing the surfactant from resin solution of Ammonium Chloride 2%, Methanol 70% and water 28% is passed through this column. So, the surfactant get transferred to the is solution

e. This solution now contains mixture of following:

1. Surfactant
2. Methanol
3. Water
4. Ammonium Chloride

Methanol is separated by distillation under vacuum so that these can be separated and all can be re used and can be recycled back to process. The methanol recovered has concentration of around 70 to 80 % which cannot be used in the process.

F. CaCl2 Plant

Calcium chloride is one of the most versatile of the basic chemicals. It has been produced commercially for well over the years. The properties and characteristics of Calcium chloride make it useful in a large number of applications. Commercially Calcium chloride is produced in following forms. Liquid Calcium chloride is manufactured in concentrations of 20% to 45% and it is also available as 32% food grade formulation.

The object this plant is to utilize of Hydrochloric Acid by neutralizing it with Calcium Carbonate. The Calcium Chloride is produced by the reaction of Calcium Carbonate ($CaCO_3$) with 32% Hydrochloric Acid in a Reactor. The resulting 35% Calcium Chloride solution is produced & further it is neutralized with lime to make it free from any acidity. It is also Clarified/ filtered to remove all suspended impurities. The clear Calcium Chloride solution is then can be transferred for further use in evaporation or granulation plant to make anhydrous/ solid material. The Calcium Chloride in the form of powder / granules / flakes are easily transportable & salable in the market in India & abroad.

Process- Calcium Chloride

The Calcium Chloride is mainly produced commercially by Limestone & Hydrochloric Acid reaction. The other production processes such as recovery from by product or naturally available forms are not covered here.

Limestone-Hydrochloric Acid Process

Limestone can be treated with hydrochloric acid to form calcium chloride and carbon dioxide: $CaCO_3+2HCl \rightarrow CaCl_2 + CO_2 + H_2O$

If concentrated (32%) hydrochloric acid is utilized, the concentration of $CaCl_2$ in the produced solution will be approximately 32% and further evaporation is only needed when flakes/ granules are produced. The purification of the product is mainly accomplished by adding $Ca(OH)_2$ as described in the natural brine process.

$Ca(OH)_2+Mg^{2+} \rightarrow Mg(OH)_2 +Ca^{2+}$

The high purity of the produced carbon dioxide (CO_2) makes it suitable for applications within the food and pharmaceutical industries e.g., in the production of carbonated soft drinks. Extremely pure calcium chloride products can be obtained using this process if the purity of the hydrochloric acid is sufficient. Hence, the process is well suited for producing food grade products. It is also an environmentally friendly method to utilize by-product hydrochloric acid.

Design Basis

The design of the process is based upon the following steps: neutralization of hydrochloric acid with limestone to produce a 35% calcium chloride solution. If

required, concentration of the CaCl2 Solution to more than 50% using a double effect evaporation system, production of flakes using the flaker, calcinations of the flakes in a rotary calciner to further concentration & packing. Alternatively, 35% calcium chloride solution directly fed to Spray Dryer / Granulation Plant.

Neutralization of HCL

The neutralization of HCL with limestone is carried out as explained above to produce CaCl2 and Co2 as by product. The CaCl2 solution which contains un-reacted solids (impurities from the limestone) settled down in bottom of the Reactors which can be removed by drain Valves/ manhole periodically to settling pits. The CaCl2 solution which contains un-reacted solids, free acid and Chlorides of other undesirable metals like Magnesium etc. (impurities from the limestone) flows by gravity to Clarifier through retention tank. Milk of Lime Solution is dosed in Reaction Tank wherein the Milk of lime reacts with free acid and other metallic chlorides. The Calcium Chloride solution becomes neutral and other metallic chlorides converted in to metallic hydroxides which are insoluble in water.

Clarification / Filtration:

The neutralized Calcium Chloride Solution impurities get settled down in Clarifier which is continuously containing insoluble impurities. The Flocculent is added in the Solution overflowing from Retention Tank to Clarifier. The undissolved solids get settled down at the bottom of Clarifier which are intermittently discharged into settling pit. The overflow from Clarifier is discharged into Calcium Chloride Solution Storage Tank. The neutralized clear solution Calcium Chloride can be filtered by Inline Polished Filter and transferred for further process of Concentration and granulation. The sludge is filtered in a separate filter Press where the cake builds up on the filter cloth. The filtrate is collected in filtrate tank and the solids are discharged.

CO2 Washing and Cleaning

The CO2 gas is transferred to CO2 Liquefaction Plant for further processing. At CO2 Plant it passes through the Scrubber & demister free of the droplets. The Washed CO2 is then discharged to further processing for Liquefaction & Dry Icing Plant or vent off to the atmosphere.

G. FKM Plant

Hexafluoro propylene and Vinylidene fluoride are the main monomers for producing FKM 2,6 rubber. These two monomers in gas form taken in 02 nos. monomer mixing tanks among which one is dedicated for reactor pressurization and the other is for polymerization. The composition of these tanks is different and maintained as per recipe. After preparation of gas mixture, it is fed to Polymerization reactor by the gas compressor. Reaction pressure and temperature maintained as per recipe value. After feeding the recipe amount of monomer mixture feed is cut off and the reactor is vented till the pressure comes to atmospheric pressure. During this venting process reactor is also cooled to 30°C by cooling water circulation through reactor jacket. After that latex formed in the reactor is discharged to degassing tank where degassing done by evacuation and nitrogen flushing simultaneously and the latex temperature is further cooled down to 20-25°C. Then after checking viscosity of the latex it is transferred to latex storage tank. It is stored there till the downstream is ready. Then this latex is coagulated in coagulator by adding coagulant into coagulator. By this process polymer gets separated from the latex and it is transferred to washing tank where vigorous washing is done of the polymer. Washing continued till the wash water effluent pH comes above 6.0. Then the material is dumped on to a rubber tank from where the material is loaded on trays after dewatering of the polymer. The trays are then placed inside the tray dryer in which drying of the polymer takes place for 24 hrs at 95°C. After drying material is weighed and packed in PPCP drums. These drums are then taken in the close mixer where additives are added for pre compounding and thereafter the material is turned into a sheet in a two-roll mill. After that sheet is cut and placed on trays for cooling (cooling is required as the material is heated up during the process of mixing and sheeting). When the sheet temperature brings down to ambient temperature then this sheet is packed in the packing boxes as per requirement.

H. ETFEE Plant

Manufacturing of E-TFEE Product Using Reaction Between 18% Ethanolic-KOH Solution & TFE Gas. The process for the ETFEE production consists of 3 steps:

1) Unloading of the Raw material into storage tanks: One of the raw materials used in the manufacturing of ETFEE is 18% KOH in Ethanol. This will be supplied to the plant by tankers which are to be unloaded into tank in an approved tank farm area.

2) Reaction: The Ethanolic KOH reacts with TFE to give the ETFEE at a temperature of 50 ± 2°C. The process steps involve

 Pumping a fixed quantity of the Ethanolic KOH into the reactor.

 Cooling the mass and qualifying the reactor to make it oxygen ree.

 Feeding the required quantity of TFE at a fixed rate and allowing the reaction to take place in controlled conditions.

 Post completion of the reaction, water addition for solid dissolution, cooling the mass and evacuating the residual gases safely. Typical batch cycle time is 8hours.

 After evacuation, the batch is transferred to a hold vessel and thereafter to the designated tank in approved tank farm.

3) Loading of Product into tanker: The crude product made in the process is sent via tankers to Ranjit Nagar facility for purification and ethanol recovery.

I. R-125 (Penta Fluor ethane)

The process includes CO removal, raw material metering, reaction, compression, distillation, drying, recovery, HFC-125 metering and storage. Refer to P&ID (BD1601-301～312) for details.

5.2.1 CO Removal

The gas from LV-1 MSU of TFE plant, under normal temperature and pressure of 1.3 kg/cm2 enter to the pre-buffer tank (V-6801), then it is cooled to 15 ℃ by pre-cooler (E-6801). It is pressurized to 6 kg/cm2 by diaphragm compressor (C-6801), pass through the after cooler (E- 6802) cooled to 25 ℃, then go into the after-buffer tank (V-6802). The gas enters the CO absorption tower (T-6800) in countercurrent contact with the solvent (acetic acid copper ammonia solution), the tower top gas go to the mixture buffer tank (V-6809) after ammonia removal through ammonia washing tank (V-6830) and the decompression of control valve. The CO- contained liquid after decompression of control valve at the tower go to the upside of reflux regeneration tower (T-6801). The structure of reflux regeneration tower is refluxing section in the upper, regeneration section in the middle and reducer at bottom. After deamination in water washing tank (V- 6805), the CO- contained exhaust gases from reflux section top go to the waste gas tank (V-6825) for pressure stabilization, then it is pressurized by the blower (C-6803A / B) and sent to incineration. The liquid from regenerator is first cooled by cooling water cooler (E - 6806) and then pumped by solvent recycle pump (P- 6801A / B) to solvent cooler (E-6804) cooled up to 15 ℃, then go to CO

absorption column (T- 6800). If the copper ratio is too high in the solvent, add compressed air to the reducer section to regulate the ratio. If total ammonia is too low in the solvent, add ammonia downstream of cooling water cooler (E-6806). If the total copper is too low, solvent out of the regenerator pass by solvent preparation tank (V-6803) to adjust the total copper. Set solvent collection tank (V- 6804) collect copper solvent emissions during shut down and maintenance. 5.2.2 Reaction (BD1601-305～306)

5.2.2.1 Catalyst preparation

Add certain quantity of TBA in reactor (R-6841A/B) and start catalyst circulation pump (P- 6844A~C) to make the liquid circulate. Add certain quantity of HF gradually by HF metering pump (P6841A~C) to form complex with TBA and the temperature is controlled by the circulating condensate in jacket. The catalyst is qualified when the mole ratio of HF to TBA reach to1.5~1.9:1.

5.2.2.2 Reaction TFE gas from TFE distillation tower(T-606) side and bottom in TFE plant and the recovered from downstream distillation system is mixed and continuously fed into the TFE stabilizing tank (V-6844). It is heated and mixed with TBA in TFE heating tower (T- 6841) and then fed into reactor (R- 6841A/B) through TFE buffer tank (V-6845). The AHF is fed into reactor by HF metering pump (P-6841A~C) after metering. Catalyst continuously circulates in reactor through catalyst preparation tank (V-6849A/B). TFE gas monomer and AHF are continuously fed into reactor to generate crude product HFC-125 under certain temperature and pressure. Crude HFC-125 gas comes out from reactor top and goes through demister cooler (E-6842) to reflux tower (T-6809) to reduce temperature. Then it goes to mixture buffer tank (V-6809) through reflux tower condenser (E-6829) for cooling.

5.2.3 Mixed gas collection, compression, dehydration and deoxidization (BD1601-307～310) TFE recovered from D-PTFE through D-PTFE buffer tank (V-6806) and TFE recovered from S-PTFE through S-PTFE buffer tank (V-6807) for pressure adjustment, then go to the mixture buffer tank (V-6809); Other continuous vent raw gas together with recovered gas emissions from distillation system go into the mixture buffer tank (V-6809).All these gas are mixed with crude HFC-125 from reflux tower. The mixture gas is compressed by the compressor (C-6802A/B), first stage outlet gas enters into the dehydrating tower (T- 6802A/B) after cooling and dehydration by

cooling dehydrator (E-6807A/B). It is cooled to -10 ℃ by low temperature dehydrating agent and continued dehydrating, then into the secondary buffer tank (V-6810), then go into the compressor for second-stage compression; Second stage outlet gas is cooled by secondary cooler (E- 6809) then go into the dryer (A-6801A ~C), silica gel adsorbed water from the gas, make the gas moisture content less than 100ppm.Then it go to deoxidizing tower (T-6803) remove O2 . If the moisture content of the gas close to 100ppm changes over the dryer, and the block up dryer is activated by steam heating and vacuuming. The polymerization inhibitor terpene via terpene metering tank (V-6813), terpene pump (P- 6803A / B) is supplied to the deoxidizing tower (T-6803), Make up terpene to NO.1 condenser (E-6812) by terpene make-up pump (P-6804A / B) on a regular interval and quantitative. 5.2.4 Distillation system (BD1601-310～312) Gas from the top of the deoxidizing tower (T-6803), passing through feeding cooler (E- 6810), enters No.1 rough separation tower (T-6804). TFE is recovered from sideline to TFE stabilizing tank (V-6844). Distillates from the top of No.1.

Condenser (E-6812), which contains NCG like R23 is sent to waste gas mixing tank (V- 6826). Trace of TFE, R32 and large quantity of HFC-125 left at the tower bottom are continuously sent to No.2 light fraction removal tower (T-6805) by discharge control valve . Light components (including trace of R32, Y3, TFE) with boiling points lower than HFC-125 are rectified from top of No.2 light fraction removal tower (T-6805) passing through the terpene tank (V-6815) and No. 2 condenser (E-6815) enter into the waste gas mixing tank(V-6826). HFC-125 from bottom of No.2 light fraction removal tower goes to No.3 distillation tower (T-6806). The side-cut gases HFC-

5.2.4 125 from top of No.3 distillation tower (T-6806) is sent to product metering tank (V- 6846A/B) through collection condenser(E- 6826). The gas contain HFC-125 and trace of Y3 at No.3 condenser (E-6818) top recycle back to mixture buffer tank(V-6809).Materials at tower bottom intermittently go into recovery tower (T-6808). Higher purity HFC-125 from top of No. 5 recovery tower (T-6808) goes back to mixture buffer tank(V-6809). Liquid at tower bottom are high-boiling residues. They are discharged to residue tank (V- 6816). The residues are compressed into steel cylinder at regular intervals and sent out of battery limit to incineration unit for disposal.

5.2.5 Product storage and filling system, and tail gas scrubbing and absorbing system (BD1601- 310～312) When the HFC-125 in product metering tank (V-6846A/B) is qualified after analysis, it can be pumped to product storage tank (V-6847) in tank field for periodical tank wagon and cylinder filling. If the moisture is not qualified, it should pass HFC-125 dryer (A-6841A/B) for drying until the moisture is qualified, then it can be pumped to tank field. If the purity is not qualified, the gas should be recovered back to mixture buffer tank (V-6809). Qualified HFC-125 is pumped by product transfer pump (P-6848A/B) through product storage tank (V-6847) to tank wagon or cylinder. If the moisture is not qualified, it should pass product dryer (A-6842A/B) for drying until the moisture is qualified. The tank wagon and cylinder and related pipeline should be treated by vacuum before filling.

5.2.6 Three waste treatment Liquid waste is discharged to liquid waste pit (V-6820), and regularly sent to ETP for treatment by liquid waste pump (P-6811A/B).(BD1601-313) Liquid at recovery tower bottom are high-boiling residues. They are discharged to residue tank (V- 6816). The residues are compressed into steel cylinder at regular intervals and sent out of battery limit to incineration unit for disposal. (BD1601- 312) Waste catalyst in waste catalyst tank (V- 6848) is stored in steel drum and regularly sent qualified third party for treatment.(BD1601- 306) All Fluoro-contained waste gas vent from plant is collected into waste gas mixing tank (V- 6826) and sent to OSBL for incineration. (BD1601-304) The acid gas from HF tanks is washed by scrubber (T-6842) and high vent. The washing liquid is discharged to liquid waste pit.
(BD1601-313) Waste silica gel and molecular sieve are nontoxic and landfill. Condensate is collected from users into condensate collecting tank(V-6819) and mainly sent to reactor(R- 6841A/B) jacket for circulation and part is transferred OSBL. (BD1601-313) The heating medium systems is for No.2 reboiler (E-6814), No. 3 reboiler (E-6817) and residue tank (V- 6816) heating. It contains heating medium tank (V- 6817) and heating medium pump (P-6808A/ B) heating medium heat exchanger (E-6843). (BD1601-313 The vacuum system consist of vacuum buffer tank (V-6818), vacuum pump (P-6809A/B). It can be expanded as per actual requirement.(BD1601-309) Where there is a high concentration of TFE, and for equipment or pipeline which is easy to explosive, safety relief facilities must be set.

J. VDF Plant

1. Cracked gas enters the primary buffer tank from atmospheric pressure gas storage after single-stage compression, then dewatered by water calcium chloride tower after drum, then through the mist eliminator and cold removal, and enters the intermediate gas storage. It enters the secondary buffer tank after two-stage compression and reaches the intermediate tank after silica gel absorber drying and pre-/mid-/end cooling.

2. The liquid phase of intermediate tank is discharged into the catcher and enters # 1 tower, low boilers on the top # 1 tower enter acetone absorption tower and then discharged into drum. Tower bottom enters # 2 tower, VDF at the top of tower enters finished product metering tank after liquefaction by collecting condenser. Tower bottom enters # 3 tower to continue fractionating and recover VDF. Liquid at the tower bottom enters # 4, remove low boilers from the tower top. Bottom material enters # 5 tower, F142b at the tower top enters F142b tank after collection, place the bottom liquid into residue tank.

(B) PROCESS HAZARDS & CONTROL MEASURES

No.	Name of the Department or Place	Name of the Hazardous Process & Operation	Material in the Process with Quantity	Name of Vessel & its location	Operating Parameters	Hazard Possible	Control Measures Provided
1.	2.	3.	4.	5.	6.	7.	8.
1.	Chloro Alkali Plant	Electrolyzing	Hydrogen, Caustic & Cl_2	Electrolyzer	Chlorine pressure-4000mmwc and Temp. – 81 degree, Hydrogen pressure-4400mmwc and Temp. – 83 degree	Explosion, Cl2 leakage & Caustic Splash	• DCS control with interlock • Gas detector alarm • Flameproof electrical fittings • Fire Hydrant System • Fire Extinguishers • Trained Manpower • PPEs
2.	Chloro Alkali Plant	Cl2 Washing & Drying	Cl2	Cl2 Cooling & washing tower	Caustic pressure -4400 mmwc and temperature-83 degree	Cl2 leakage	• DCS control with interlock • Gas detector alarm • Trained Manpower • PPEs

No.	Name of the Department or Place	Name of the Hazardous Process & Operation	Material in the Process with Quantity	Name of Vessel & its location	Operating Parameters	Hazard Possible	Control Measures Provided
1.	2.	3.	4.	5.	6.	7.	8.
3.	Chloro Alkali Plant	H2 Washing	H2	H2 washing tower	Chlorine washing tower pressure-4000mmwc , temp. – 50 degree and chlorine cooling tower pressure – 3600mmwc ,Temp. 35 degree	Explosion	• DCS control with interlock • Pressure relief valve • Flameproof electrical fittings • Fire Hydrant System • Fire Extinguishers • Trained Manpower • PPEs
4.	Chloro Alkali Plant	H2 Compression	H2	H2 compressor	Pressure – 2300mmwc and Temp. 40 degree	Explosion	• DCS control with interlock • Pressure relief valve • Gas detection system • Flameproof electrical fittings • Fire Hydrant System • Fire Extinguishers • Trained Manpower • PPEs

No.	Name of the Department or Place	Name of the Hazardous Process & Operation	Material in the Process with Quantity	Name of Vessel & its location	Operating Parameters	Hazard Possible	Control Measures Provided
1.	2.	3.	4.	5.	6.	7.	8.
5.	Chloro Alkali Plant	Caustic Concentration	Caustic	Evaporation Unit	Pressure – 200bar and Temp. 50 degree	Caustic Splash	• DCS control with interlock • Trained Manpower • PPEs
6.	Chloro Alkali Plant	Cl2 liquefier	Cl2	Liquefier	Pressure – (-650mmHg) and Temp. 125 to 130 degree	Cl2 leakage	• DCS control with interlock • Gas detector alarm • Trained Manpower • PPEs
7.	Chloro Alkali Plant	Cl2 vaporizer	Cl2	Vaporizer	Pressure – 3.5 Kg/cm2 and Temp. 2 to 5 degree	Cl2 leakage	• DCS control with interlock • Gas detector alarm • Trained Manpower • PPEs
8.	Chloromethanes Plant	Chlorination	Methanol and HCl as per plant load	Hydro chlorination or Pressure	Pressure - 3.10 Kg/cm2 and Temp. 220 degree	Leakage / rupture in the out let pipe	• DCS control with interlock • Flameproof electrical fittings • Fire Hydrant System • Fire Extinguishers

No.	Name of the Department or Place	Name of the Hazardous Process & Operation	Material in the Process with Quantity	Name of Vessel & its location	Operating Parameters	Hazard Possible	Control Measures Provided
1.	2.	3.	4.	5.	6.	7.	8.
							• Trained Manpower • PPEs
9.	Chloromethanes Plant	Stripping	Chloromethane as per plant load	Organics stripper	Pressure - 0.058 Kg/cm2	Leakage through nozzles, gaskets, flanges etc. due to unavailability / failure of cooling water	• DCS control with interlock • Flameproof electrical fittings • Fire Hydrant System • Fire Extinguishers • Trained Manpower • PPEs
10.	Chloromethanes Plant	Absorption	HCl, caustic soda and water as per plant load	HCl absorber	Pressure - 0.058 Kg/cm2	High pressure/ levels	• DCS control with interlock • Trained Manpower • PPEs

No.	Name of the Department or Place	Name of the Hazardous Process & Operation	Material in the Process with Quantity	Name of Vessel & its location	Operating Parameters	Hazard Possible	Control Measures Provided
1.	2.	3.	4.	5.	6.	7.	8.
11.	Chloromethanes Plant	Quenching	Chloromethane, HCl and water as per plant load	Quenching and dehydrating system	Pressure- 6.68 Kg/cm2 and Temp. 71 degree	Leakage in the reactor outlet pipe/ rupture in below EX2104	• DCS control with interlock • Flameproof electrical fittings • Fire Hydrant System • Fire Extinguishers • Trained Manpower • PPEs
12.	Chloromethanes Plant	Chlorination	Methyl chloride and chlorine as per plant load	Thermal chlorination section – CH3Cl distillation section	Cl2 - 2200 Nm3/hrs (Pressure - 10.8 Kg/cme and Temp. 75 degree	Closure of manual valves, Malfunctioning of LIA2307	• DCS control with interlock • Flameproof electrical fittings • Fire Hydrant System • Fire Extinguishers • Trained Manpower • PPEs
13.	TFE Plant	Combustion	Natural gas and steam	Back firing furnace	Temp. Max 950 degree & Pressure -3~-30 mmwc	Explosion and fire	• DCS control with interlock • Flameproof electrical fittings • Fire Hydrant System

No.	Name of the Department or Place	Name of the Hazardous Process & Operation	Material in the Process with Quantity	Name of Vessel & its location	Operating Parameters	Hazard Possible	Control Measures Provided
1.	2.	3.	4.	5.	6.	7.	8.
							• Fire Extinguishers • Trained Manpower • PPEs
14.	TFE Plant	Condensation	Tetra Fluoroethylene	TFE Condenser	Team. -20 ~ -16 degree and Pressure 10± 0.5 Kg/cm2	Explosion	• RCC explosion proof covering to reactor. • Flameproof electrical fittings • Fire Hydrant System • Fire Extinguishers • Trained Manpower • PPEs
15.	TFE Plant	Thermal Cracking	Chlorodifloro methane	Steam heated furnace & cracking reactor	Temp. max 760 degree	Explosion	• RCC explosion proof covering to reactor. • Flameproof electrical fittings • Fire Hydrant System • Fire Extinguishers

No.	Name of the Department or Place	Name of the Hazardous Process & Operation	Material in the Process with Quantity	Name of Vessel & its location	Operating Parameters	Hazard Possible	Control Measures Provided
1.	2.	3.	4.	5.	6.	7.	8.
							• Trained Manpower • PPEs
16.	TFE Plant	Distillation	Tetrafluoro ethylene and other hydro carbons as per the plant load	Distillation tower	Team. -20 ~ -16 degree and Pressure 10± 0.5 Kg/cm2	Explosion	• RCC explosion proof covering to reactor. • Flameproof electrical fittings • Fire Hydrant System • Fire Extinguishers • Trained Manpower • PPEs
17.	PTFE Plant	MMT, MST, Condense Process	Tetra fluoroethylene	MMT, Metacones Process	Temp.; >100 & Pressure 6 to 12 kg/cm2	Explosion & self polymerization	• RCC explosion proof covering to reactor. • DCS monitoring & field observations • Flameproof electrical fittings • Fire Hydrant System

No.	Name of the Department or Place	Name of the Hazardous Process & Operation	Material in the Process with Quantity	Name of Vessel & its location	Operating Parameters	Hazard Possible	Control Measures Provided
1.	2.	3.	4.	5.	6.	7.	8.
							• Fire Extinguishers • Trained Manpower • PPEs
18.	PTFE Plant	Polymerization	Tetra fluoroethylene, de-ionized water	Reactors & Silica Gel	Temp.; >650 & Pressure 6 to 12 kg/cm2	Explosion, run away reaction	• RCC explosion proof separation wall • Interlocks connected to DCS to monitor parameters • Flameproof electrical fittings • Fire Hydrant System • Fire Extinguishers • Trained Manpower • PPEs
19.	Power Plant	Steam Generation	Natural Gas, Hydrogen & Coal	Boiler	Pressure 68 kg/cm2 , Temp.- 485 ± 5 °C	Explosion	• Pressure relief valve • Temperature & pressure indicator

No.	Name of the Department or Place	Name of the Hazardous Process & Operation	Material in the Process with Quantity	Name of Vessel & its location	Operating Parameters	Hazard Possible	Control Measures Provided
1.	2.	3.	4.	5.	6.	7.	8.
							• Flameproof electrical fittings • Fire Hydrant System • Fire Extinguishers • Trained Manpower • PPEs
20.	AHF Plant	Combustion, Reaction, Condensation, Distillation	Natural Gas, Hydrofluoric Acid, Sulfuric acid, Oleum acid, Chloroform, Chlorofluoro methane	Kiln, Associator, Stripping column, Distillation column, Reactor, Stripper, Distillation Tower	1) Kiln: Pressure: (-5 to -10 mmwc vacuum) Temp : 450-550 C 2) Distillation section operated at Pressure:- -1400 to -1800 mmwc	Toxic release, fire explosion	• Interlocks connected to DCS to Monitor parameters • Back end scrubber • Dump tank • Centralized scrubber • Flameproof electrical fittings • Fire Hydrant System • Fire Extinguishers • SCBA Set • Trained Manpower

No.	Name of the Department or Place	Name of the Hazardous Process & Operation	Material in the Process with Quantity	Name of Vessel & its location	Operating Parameters	Hazard Possible	Control Measures Provided
1.	2.	3.	4.	5.	6.	7.	8.
					Temperature: 15 to 20 C 3) Reactor Parameters: Pressure: 9.5 to 10.0 kg/cm2 Temperature:60-85 C 4) Distillation columns Pressure:16.5 kg/cm2 to 25 kg/cm2 Temperature:50-110 C		• PPEs

No.	Name of the Department or Place	Name of the Hazardous Process & Operation	Material in the Process with Quantity	Name of Vessel & its location	Operating Parameters	Hazard Possible	Control Measures Provided
1.	2.	3.	4.	5.	6.	7.	8.
21.	FKM Plant	Polymerization	TFE, HFP & VDF	Reactor	Pressure min-20, max-30 kg/cm2 and Temp. -80 to 10 degree	Toxic release, fire explosion	• Interlocks connected to DCS to Monitor parameters • RCC explosion proof covering to reactor. • Field observations • Flameproof electrical fittings • Fire Hydrant System • Fire Extinguishers • SCBA Set • Trained Manpower • PPEs
22.	E-TFEE Plant	Polymerization	Ethanolic KOH & TFE	Reactor	Pressure 5 kg/cm2 and temp. 55 60 degree	Toxic release, fire explosion	• Interlocks connected to DCS to Monitor parameters • RCC explosion proof covering to reactor.

No.	Name of the Department or Place	Name of the Hazardous Process & Operation	Material in the Process with Quantity	Name of Vessel & its location	Operating Parameters	Hazard Possible	Control Measures Provided
1.	2.	3.	4.	5.	6.	7.	8.
							• Field observations • Flameproof electrical fittings • Fire Hydrant System • Fire Extinguishers • SCBA Set • Trained Manpower • PPEs
23.	A & H Plant	Unloading of Oleum tanker into Oleum	Oleum	Oleum storage tank T-3102-A/B, located at G. Floor in Tank Farm	Ambient temperature and pressure.	Toxic release	• Level transmitter and level switch with interlock of high level with pump • Fire Hydrant System • Fire Extinguishers • SCBA Set • Trained Manpower • PPEs

3.5 GENERAL HAZARD & CONTROL MEASURES

No.	Name of the possible Hazard or Emergency	Its Source & Reason	Its effects on Persons, Property & Environment	Control Measures provided
1.	2.	3.	4.	5.
1.	Fire	• Flammable Chemicals • Static Charge	• Property Damage • Burn injury • Air Pollution	• Flameproof Equipments • Earthing & Bonding • Fire Hydrant System • Fire Extinguishers • Fire Tender
2.	Toxic Release	• Toxic Chemicals	• Toxic Effects to Plant Personnel • Product Loss • Air Pollution	• Trained & Experienced Operators • Safety Valves • Chlorine Gas Detectors • Online breathing air pipeline with air mask assembly • Water sprinkler system • SCBA set
3.	Electric Hazards	• Electric shock	• Fire	• Earthing

No.	Name of the possible Hazard or Emergency	Its Source & Reason	Its effects on Persons, Property & Environment	Control Measures provided
1.	2.	3.	4.	5.
		• Overload • Improper Earthing • Bad Maintenance	• Electric Burn • Breathing Problem	• Fuses & Circuit breakers • Gloves & Shoes • Insulation & Isolation • Flame-proof fittings & equipments
4.	Material Handling	Over Load while manual work.	• Body Pain • Slip & Trips	• Forklifts • EOT Crane • Chain Pulley Block • Skilled Plant Personnel • Training
5.	Boiler Explosion	• High Temperature • High Pressure • Mechanical Failure • Operating Failure	• Air Pollution • Property Damage • Human Injury	• Trained Operator • Periodic Maintenance • Safety Relief Valve • Fire Extinguishers • Fire Hydrant System • Fire Tender

No.	Name of the possible Hazard or Emergency	Its Source & Reason	Its effects on Persons, Property & Environment	Control Measures provided
1.	2.	3.	4.	5.
6.	Noise	• Compressors • Machineries • D. G. Set	• Hearing Loss • Headache	• Enclosures • Silencer • Isolated Cabins • Ear Muffs & Ear Plugs • Lubrication

3.6 OTHER HAZARDS & CONTROLS

No.	Name of Waste	Category Number	Quantity in MT/ Year			Facility
			Existing	Proposed	Total	
1.	2.	3.	4.	5.	6.	7.
1.	Used Oil	5.1	85.4 KL	0	85.4 KL	Collection, Storage, Reuse, Transportation and send to authorized recycler/ refiners.
2.	Empty Barrels/ Discarded Carboys/ Drums/ Cylinders	33.1	25 MT	0	25 MT	Collection, Storage, Decontamination/ Detoxification, Reuse, Transportation and send to authorized decontamination facility.
3.	Spent Resins from DM plant	35.2	25 MT	0	25 MT	Collection, Storage, Transportation and Disposal at approved CHWIF/TSDF Site.
4.	ETP Sludge	35.3	4562 MT	0	4562 MT	Collection, Storage, Transportation and Disposal at GPCB approved common TSDF site.
5.	Sludge from wet scrubber	16.2	2 MT	0	2 MT	Collection, Storage, Transportation and send for Co-processing facility to cement

No.	Name of Waste	Category Number	Quantity in MT/ Year			Facility
			Existing	Proposed	Total	
1.	2.	3.	4.	5.	6.	7.
						industry registered with XGN/ CHWIF/ common TSDF site.
6.	Spent Catalyst	17.2	28.72 MT	-0.01 MT	28.72 MT	Collection, Storage, Transportation and send for Co-processing facility to cement industry registered with XGN/ CHWIF/ common TSDF site.
7.	Process waste/ Dist. Residue	36.1	2369 MT	-10.58 MT	2358.42 MT	Collection, Storage, Transportation and send to authorized Actual end-user having Rule-9 permission & valid CCA after making MoU/ send for Co-processing facility to cement industry registered with XGN/ CHWIF.
8.	PTFE Residue	1.4	170 MT	0	170 MT	Collection, Storage, Transportation and send for Co-processing facility to cement industry registered with XGN/ CHWIF/ common TSDF site.
9.	Distillation Residue	20.3	2.4 MT	0	2.4 MT	

3.7APPLICABILITY OF THE HSE STATUTORY REQUIREMENTS (LICENSES, FORMS & NOTICES)

Looking to the above chemicals, their Storage Quantities and Process Parameters, applicability of some safety laws is discussed below:

3.7.1 The Factories Act - 1948 & The Gujarat Factories Rules - 1963

- The Manufacturing process of this factory falls under **Item No. 17 & 29** of **Ist Schedule** of the Factories Act - 1948 and nature of the manufacturing process falls u/s 2(cb) thereof. Therefore, the factory carries out **"Hazardous Process".** Therefore, provisions of Chapter 4-A of the Factories Act- 1948 & Rules 68-K to 68-Y of the Gujarat Factories Rules - 1963 are applicable.

- Therefore, provisions of information to workers and authorities, health and safety policy, information of industrial wastes, MSDS, health records to workers, qualified supervisors, Factory Medical Officer, Occupational Health Centre, Ambulance Van, Safety Committee and decontamination facility are applicable. Hence, these provisions were checked during the audit. Non-conformity and suggestions are reported in Para 3.8 and Chapter-4.

- Following chemicals are used / evolved in this factory and their prescribed TLV and STEL values under 2nd Schedule of the Factories Act 1948 are as under:

NO.	CHEMICAL	TLV	STEL
1.	2.	3.	4.
1.	Chlorine	1 ppm	3 ppm
2.	Methanol	200 ppm	250 ppm
3.	Sulphuric acid	1 mg/m^3	--
4.	Hydrochloric acid (Hydrogen Chloride)	5 ppm	--
5.	Chloroform	10 ppm	--
6.	Carbon Tetrachloride (CTC)	5 ppm	--
7.	Sodium Hydroxide	2 mg/m^3	--

***TLV Value from 2nd Schedule of Factory Act - 1948**

- Above permissible limits should not be exceeded in work environment (breathing zone) where workers are working. Form No. 37, u/r 12-B, GFR, should be maintained in respect of monitoring of above chemicals in working environment in the factory. Necessary equipment to take samples of exposures of above chemicals (in breathing zone) and to measure their values (as stated above) should be utilized and shall be maintained.

- Following chemicals used/ evolved in this factory are listed in Part I & II of Schedule 1 or Column 2 of Schedule 3 of Rule 68-J of the Gujarat Factories Rules 1963:

SR. NO.	CHEMICALS
1.	2.
1.	Chlorine
2.	Methanol
3.	Sulphuric acid (98%)
4.	Sulphuric acid (88%)
5.	Hydrochloric acid (31%)
6.	Chloroform
7.	Carbon Tetrachloride (CTC)
8.	Vinylidene Fluoride (VDF)
9.	Oleum
10.	R142b

- Names of above chemicals are listed in Part I & II of Schedule I or Column 2 of Schedule 3 of Rules 68-J (GFR-1963). Therefore, it can be said that the factory uses '**Hazardous Chemicals**'.

- Storage Capacities of Hazardous Chemicals are as follow:

SR. NO.	CHEMICALS	STORAGE CAPACITY
1.	2.	3.
1.	Chlorine	315 KL
2.	Methanol	250 MT
3.	Sulphuric acid (98%)	608 KL
4.	Sulphuric acid (88%)	360 KL
5.	Hydrochloric acid (31%)	260 KL
6.	Chloroform	237 KL
7.	Carbon Tetrachloride (CTC)	268 KL
8.	Vinylidene Fluoride (VDF)	39 KL
9.	Oleum	170 KL
10.	R142b	79 KL

- Storage Quantity of Vinylidene Fluoride (VDF) is more than the quantity mentioned in Column 3 of Part – 2 of schedule 3 of Rules 68-J (GFR-1963) &
- Storage Quantity of Chlorine is more than the quantity mentioned in Column 3 of Part – 1 of schedule 3 of Rules 68-J (GFR-1963).
- Storage Quantity of R142b is more than the quantity mentioned in Column 3 & 4 of Part – 2 of Schedule-3 of Rules 68-J (GFR-1963).
- Therefore, this factory classified as a **MAH (Major Accident Hazard) Installation.**
- So sub Rules 4 - 8, 10 - 13 & 15 of GFR 68-J are applicable.

- Factory uses various chemicals in its manufacturing process hence Schedule 12 & 19 of Rule 102 of The GFR- 1963 is applicable hence Housekeeping, Prohibition on the use of food at workplace, Requirement for Authorized entry, Examination of instruments and safety devices, Facility for isolation, Personal protective equipment, Testing examination and repair of plant and equipment, Permit for Entry into or work in confined spaces and PTW system, and other requirement for prevention of fire & explosion are applicable. More over Factory carry out welding and cutting operation hence schedule XXIV (Welding/ Cutting Operation with the use of LPG/ Acetylene/ Argon) of the Rule -102 of GFR-1963 is to be complied.

- General provisions of the Factories Act 1948 and the Gujarat Factories Rules 1963 are always applicable. Attention is drawn towards sections No. 28, 29, 30 & 31 and Rules there under. Rules 58, 59, 60 and 61 are applicable and strictly followed and its records in Form No. - 9, 10 and 11 shall be maintained.

❖ FACTORY LICENSE: -

- License No.: 15074
- D.A.: 30-Jan-2007
- Registration No.: 562/24111/2007
- FIN: S06015074A
- Maximum number of workers to be employed: 5000
- Maximum installed power in B.H.P.: Above 5000
- License is renewed up to **31st December 2025**
- Granted to: Mr. Sanath Kumar Muppirala + 11 Directors

❖ PLAN APPROVAL & STABILITY CERTIFICATE: -

No.	Plan Approval No. & Date	Issued Date	Due Date
1.	2.	3.	4.
1.	DISH/ F-PLAN/ 2019/ 1341 Dated: 16.05.2019 & DISH/ AHM/ F-PLAN/ 4420/ 2023 Dated: 04.11.2023 Mfg. on Ground to Sixth Floor Only	08.08.2024	07.08.2029
• Competent Person: Mr. J. J. Mistry • Certificate No.: DISH/A/CPT GUJ/0154			

❖ Test Report of Pressure Vessel and Pressure Plant under section 31 and rule 61 in **FORM NO. 11.**

No.	Identification of Vessel	Test Date	Due Date
1.	2.	3.	4.
Total 437 Nos. of Pressure Vessels are tested by Competent Person, Validated & Records are maintained.			

❖ Test Report of examination of the Lifting Machines, Ropes & Lifting Tackles in **FORM NO. 10**

No.	Identification of Equipment	Test Date	Due Date
1.	2.	3.	4.
Total 208 nos. of Lifting Machines, Ropes & Lifting Tackles etc. are tested by Competent Person, Validated & Records are maintained.			

❖ Test Report of examination of the Hoist and Lifts in **FORM NO. 9**

No.	Identification of Hoist & Lift	Test Date	Due Date
1.	2.	3.	4.
Total 8 nos. of Goods lift is tested by Competent Person, Validated & Records are maintained.			

3.7.2 The Manufacture, Storage and Import of Hazardous Chemicals Rules – 1989 (As amended in 2000)

Following chemicals used in this factory is listed in Part I or Part II of Schedule 1 of MSIHC Rules:

SR. NO.	CHEMICALS
1.	2.
1.	Chlorine
2.	Methanol
3.	Sulphuric acid (98%)
4.	Sulphuric acid (88%)
5.	Hydrochloric acid (31%)
6.	Chloroform
7.	Carbon Tetrachloride (CTC)
8.	Vinylidene Fluoride (VDF)
9.	Oleum
10.	R142b
11.	Caustic Lye (Sodium Hydroxide) (32%)
12.	Caustic Lye (Sodium Hydroxide) (48%)

- Therefore, it can be said that the factory uses **'Hazardous Chemicals'.**

- Storage Capacities of Hazardous Chemicals are as follow:

SR. NO.	CHEMICALS	STORAGE CAPACITY
1.	2.	3.
1.	Chlorine	315 KL
2.	Methanol	250 MT
3.	Sulphuric acid (98%)	608 KL
4.	Sulphuric acid (88%)	360 KL
5.	Hydrochloric acid (31%)	260 KL
6.	Chloroform	237 KL
7.	Carbon Tetrachloride (CTC)	268 KL
8.	Vinylidene Fluoride (VDF)	39 KL
9.	Oleum	170 KL
10.	R142b	79 KL
11.	Caustic Lye (Sodium Hydroxide) (32%)	310 KL
12.	Caustic Lye (Sodium Hydroxide) (48%)	3576 KL

- Storage Quantity of Vinylidene Fluoride (VDF) is more than the quantity mentioned in Column-3 of Part 2 of Schedule-3 of the MSIHC Rules, 1989.
- Storage Quantity of Chlorine is more than the quantity mentioned in Column-3 of Part 1 of Schedule-3 of the MSIHC Rules, 1989.
- Storage Quantity of R142b is more than the quantity mentioned in Column 3 & 4 of Part 2 of Schedule-3 of the MSIHC Rules, 1989.
- Therefore, this factory is classified as a **MAH (Major Accident Hazard)** factory.
- Therefore sub rule 5, 7 to 15 are applicable under MSIHC Rules 1989.

3.7.3 The Public Liability Insurance Act – 1991 & Rules - 1991

- From: Future Generali India Insurance Company Ltd.
- Policy No.: L0258176
- Period: From 00:00 hours of 05/04/2024 To Midnight of 04/04/2025

3.7.4 The Environmental Laws

Consent & Authorization Order No. **AWH-118244** Dated 07.09.2022 and Valid up to **15.02.2027** from the GPCB with respect of applicability of the Water Act – 1974, The Air Act – 1981 & Authorization under Hazardous & other Wastes (Management & Transboundary Movement) Rules – 2016 under Environment (Protection) Act – 1986 for the use of outlet for the discharge of trade effluent & emission due to operation of Industrial Plant for the manufacturing of its products.

HAZARDOUS WASTE REGISTRATION: -

1. **FROM: M/s. BEIL INFRASTRUCTURE LTD.**
   - Purpose: For Common Solid Waste Disposal Facility
   - Membership No.: Oth/ 083
   - Quantity: 1000 MT/ Year
   - Date of issue: 25.03.2011

2. **FROM: M/s. BANAS WASTE MANAGEMENT LLP**
   - Purpose: For pre-processing/ co-processing waste
   - Membership No.: BWML/MEM/24/44
   - Date of issue: 20.09.2024

3.7.5 SMPV (U) Rules - 2016

Chemical Substance: R125

- License No.: S/HO/GJ/03/2528 (S104643)
- Dated: 01.04.2024

Chemical Substance: Chlorine

- License No.: S/HO/GJ/03/915 (S30612)
- Dated: 27.09.2024
- Date of Expiry: 30.09.2029
- Water capacity: 316 m^3
- Maximum Working pressure: 10 kg/cm^2
- Quantity Granted in kgs.: 12000
- Vessel No.: D-540, D-540A/B

Chemical Substance: Vinylidene Fluoride (VDF)

- License No.: S/HO/GJ/03/1778 (S73093)
- Dated: 25.09.2020
- Date of Expiry: **30.09.2025**
- Water capacity: 39 m^3
- Maximum Working pressure: 12.24 kg/cm^2
- Quantity Granted in kgs.: 36,680
- Vessel No.: 1011622003/1

Chemical Substance: R142b

- License No.: S/HO/GJ/03/2054 (S93764)
- Dated: 22.08.2023
- Date of Expiry: **30.09.2028**
- Water capacity: 39.50 m^3

- Maximum Working pressure: 4.5 kg/cm^2
- Quantity Granted in kgs.: 42516
- Vessel No.: 26V0101B

Chemical Substance: R23

- License No.: S/HO/GJ/03/1705 (S66174)
- Dated: 22.08.2023
- Date of Expiry: **30.09.2028**
- Water capacity: 14.53 m^3
- Maximum Working pressure: 17 kg/cm^2
- Quantity Granted in kgs.: 12009
- Vessel No.: V-709 (0542/3)

Chemical Substance: R22, HFP & R125

- License No.: S/HO/GJ/03/953 (S31114)
- Dated: 25.09.2020
- Date of Expiry: **30.09.2025**
- Water capacity: 39 m^3
- Maximum Working pressure: 12.24 kg/cm^2
- Quantity Granted in kgs.: 36,680
- Vessel No.: 1011622003/1

Vessel No./वेसल नंबर	Name of Gas/गैस का नाम	State of Gas/गैस की स्थिति	Water Capacity in cubic meter/जल क्षमता (घ.मी.)	Max. working Pre. (kg/cm^2)/अधिकतम वर्किंग प्रेशर	Quantity Granted in kgs(Liquified gas)/किलोग्रॅम में जारी मात्रा (लिक्विफाईड गैसेस)
T-1 (V 632 A)	R-22 (Chlorodifluoromethane)	Liquified	80.00	12	80400
T-2 (V 632 B)	R-22 (Chlorodifluoromethane)	Liquified	80.00	12	80400
V-632	Hexafluoropropylene (HFP)	Liquified	80.00	11.1	86488
UF-497 (V-6847)	R-125	Liquified	40.00	21.0	36100
Total Water capacity			280.00		

Chemical Substance: Liquid Nitrogen

- License No.: S/HO/GJ/03/944 (S31609)
- Dated: 22.08.2023
- Date of Expiry: **30.09.2028**

Vessel No./वेसल नंबर	Name of Gas/ गैस का नाम	State of Gas/ गैस की स्थिति	Water Capacity in cubic meter/ जल क्षमता (घ.मी.)	Max. working Pre.(kg/cm^2)/ अधिकतम वर्किंग प्रेशर	Quantity Granted in kgs(Liquified gas)/किलोग्रॅम में जारी मात्रा (लिक्विफाईड गैसेस)
604/5 Model V2124DC	LIQUID NITROGEN	Liquified	19.38	24	14000
1011021179/1	LIQUID NITROGEN	Liquified	3.69	37.72	2660
1011221146/1	LIQUID NITROGEN	Liquified	40.39	27.53	29079
Total Water capacity			**63.46**		

3.7.6 The Petroleum Act – 1993 & The Petroleum Rules – 2002

- Quantity Petroleum Class A in bulk: 240 KL
- License No.: P/HQ/GJ/15/4798 (P184279)
- Dated: 14.10.2015
- Valid upto: **31.12.2025**

- Quantity Petroleum Class A in bulk: 20 KL
- License No.: P/HQ/GJ/15/5466 (P369983)
- Dated: 11.07.2017
- Valid upto: **31.12.2026**

3.7.7 The Gas Cylinder Rules – 2016

License for Storage of Ammonia Gas Cylinders

- License No.: G/WB/GJ/06/205 (G47478)
- Dated: 02.05.2018
- Date of Expiry: **30.09.2027**

- Type of Gas: Toxic
- Quantity: Storage of 50 Nos. of Ammonia Cylinders

License for Storage of Fluorine Gas Cylinders

- License No.: G/WB/GJ/06/1036 (G118261)
- Dated: 04.03.2024
- Date of Expiry: **30.09.2026**
- Type of Gas: Toxic
- Quantity: Storage of 144 Nos. of Fluorine Cylinders

License for filling & storage of HFP

- License No.: G/HO/GJ/05/688 & G/HO/GJ/06/678 (G27680)
- Dated: 12.11.2020
- Date of Expiry: **30.09.2030**
- Type of Gas: Non-Toxic & Non-Flammable Hexafluropropene (R-1216)
- Filling points: 1 No. (1 x 1)
- Quantity of cylinder: 23 Nos.

License for filling & storage of Hydrogen

- License No.: G/HO/GJ/05/586 & G/HO/GJ/06/575 (G22172)
- Dated: 23.06.2021
- Date of Expiry: **30.09.2029**
- Type of Gas: Non-Toxic & Flammable Hydrogen
- Filling points: 38 Nos. (1 x 4 2 x 16)
- Quantity of cylinder: 315 Nos.

3.7.8 The Boilers Act – 1923 & The Gujarat Boiler Rules – 1966

BOILER NO. 1

- Registration Number: GT-8091
- Type of Boiler: Water Tube-Power Boiler
- Boiler Rating: 4324.00 m^2
- Max. Working Pressure: 81 kg/cm^2
- Working period: **25.05.2024** to **24.05.2025**

BOILER NO. 2

- Registration Number: GT-6041
- Type of Boiler: Water Tube-Power Boiler
- Boiler Rating: 3518 m^2
- Max. Working Pressure: 81 kg/cm^2
- Working period: **07.05.2024** to **06.05.2025**

3.7.9 License under Poison Act, 1919

- Register No.: 04/2018
- Sulphuric Acid: 162.7 KL
- Hydrochloric Acid: 1850 KL
- No. MAG/Poison Lic/Ws/1857
- Date: 02.11.2018
- Date of Expiry: **01.11.2023**
- **Note:** Applied for renewal

3.7.10 The Chemical Accident (EPPR) Rules – 1996.

Looking to the quantities of the hazardous chemicals is more than the threshold quantities mentioned in above Para, these Rules are applicable. The Company uses hazardous chemicals so the Factory shall become a member of the Local Crisis Group & District Crisis Group of the Off-Site Emergency Plan made for the local area & Bharuch district respectively.

3.7.11 The Motor Vehicle Act - 1988 and the Central MV Rules - 1989

Because of the Hazardous Chemicals transported through vehicles, provisions of the Motor Vehicles Act and Rules are applicable. Necessary RC books, driving licenses and insurance policies are obtained. They should be kept renewed.

- No driver shall be allowed or required to drive any vehicle without appropriate driving license.
- All drivers to carry hazardous chemicals should be trained as required by Rule 135 of the Central Motor Vehicles Rules 1989.
- Compliance of Rules 129 to 137 of the Central Motor Vehicles Rules 1989 is required in respect of transportation of hazardous chemicals byroad tankers. This includes displaying of prescribed class labels, techno-graph fitted in motor vehicle, use of spark arrestor, responsibilities of the consignor, transporter and driver, emergency information panel on goods carriage, training to driver and reporting of accident by the driver etc.

3.7.12 Schedule 19 – Chemical works Part II para 23 procedure for meeting emergencies (General Requirements applying to all works in the 1st Schedule of the Act)

1. As per Schedule 19 part II para 23 of GFR 102, the occupier of every factory carrying out the works covered under the 1st Schedule of the Act, shall arrange to identify all type of possible emergency that could occur in the processes during the course of work or while carrying out maintenance work or repair work. The emergencies so identified shall be reviewed yearly.
2. The Occupier shall formulate a detail plan to meet all such identified emergency including arrangements for summoning outside helper rescue and firefighting and arrangement for making available urgent medical facility i.e. the occupier shall prepare on site emergency plan as per schedule -8A.
3. The Onsite Emergency Plan must be rehearsed every three months and deficiencies, if any, in achievement of the objective shall suitably the corrected.
4. The entire employees shall be trained about the action to be taken including evacuation procedure during emergency.
5. The Occupier shall have arranged 10% of the workers use in first aid firefighting appliances'.

3.8 PLANT WISE AUDIT OBSERVATIONS

NO.	OBSERVATIONS	RECOMMENDATIONS
General		
1.	Factory is involved in hazardous processes under sec-2 (cb) of the factories act, 1948 and listed in the first schedule of the act on Serial No:17 & 29. So provision of sec 41- C (b) is applicable to appoint persons who possess qualifications and experience in handling hazardous substances and are competent to supervise such handling within the factory.	Under section 41-C(b) It is mandatory to appoint persons who possess qualifications and experience in handling hazardous substances and are competent to supervise such handling within the factory. So, It is advised to appoint qualified competent supervisors who had undergone training in the institute recognized by DGFASLI for competent supervisors and possess certificate of competent supervisor issued by DGFASLI.
2.	The main entry gate was motor operated. In case of emergency situation and power failure, the gate manual operation was not possible.	Review for a quick declutching mechanism.
OHC		
3.	In the Ambulance inspection checklist, the O_2 cylinder pressure mentioned as OK, but actual pressure value was not mentioned.	The checklist needs to be reviewed for actual O_2 cylinder pressure, better to mention actual cylinder pressure instead of making remark as OK.
4.	O_2 cylinder's pressure test certificates along with Oxygen gas quality test	To get the pressure test certificates as well as the O_2 quality analysis report from the vendor / supplier.

NO.	OBSERVATIONS	RECOMMENDATIONS
	certificates were not available with the OHC dept.	
5.	Safety shower No. SS-12 – Filters of the Eye lids were not cleaned since long time, found rust particles with dust in it.	To clean the safety showers periodically & ensure that the eye lid filters are cleaned thoroughly.
PT/ PTFE Plant		
6.	The CO_2 fire extinguishers operational training provided to the employees but the operator present on duty was not aware about the cold burn hazards associated with the CO_2 gas.	To provide the training / refresher training of the fire extinguishers operations with hazards associated with each type of fire extinguishers.
Milling Area		
7.	The Electrical Panel room's entry was blocked by the PTFE FG material, also the door with its partition was badly damaged by the impact of the forklift, no protective guard provided.	To maintain the good housekeeping, keep walkways clear from the obstacles. Put the protective barriers to avoid the mechanical impact of forklift.
8.	Fire extinguisher No. FE/28 was blocked by the FG material, very difficult to use it in case of emergency.	Always ensure to keep emergency first aid firefighting equipments free from the obstacles.
9.	GLR (PFA) Reactor – The double earthing provided to the motor but only single earthing provided to the reactor.	To provide the double earthing to the GLR Reactor and connect the other ends of the earthing strips to the separate earth pits.
10.	Forklift daily inspection not carried out by the drivers. The reverse horn of the	The user department should ensure that the Forklift driver must carry out daily inspection of the forklift handled and

NO.	OBSERVATIONS	RECOMMENDATIONS
	Forklift No. FL-1 73212 was not working.	duly inspected by the immediate superior with counter sign.
11.	One scaffolding was erected on the walkway near PT/PTFE plant but the horizontal pipe ends were not covered, potential head/ eye injury.	The Scaffold inspector must ensure that the scaffold erected is safe to use (hazard free) prior to issuing green tag. The safety dept. to do random audits/ inspections of the scaffolds under use.
R-125 Plant		
12.	Brief MSDS display boards of the hazardous chemicals like NH_3, CO were not observed in the plant area.	To display brief MSDS boards and provide training/ refresher training to all the concerned.
13.	PA system installed on the ground floor with its Allen screws were missing at two places, purpose of flame proof electrical fittings gets defeated.	The Work Permit generator / initiator must ensure that all the flameproof equipment's integrity intact, prior to closure of the work permit.
14.	TFE inlet & outlet lines were observed without copper bonding, potential fire hazard.	To install the copper bonding for each flange joints of TFE inlet & outlet lines. Ensure that the copper jumpers installed are intact. Plan and carry out periodical inspection of the copper bonding especially for the pipelines erected on the pipe racks.
GFRC & Laboratory		
15.	Detail training of MSDS is not provided to the employees.	To provide in depth MSDS training to the concerned.
16.	R&D HIRA – Cylinder handling risk rating not provided for CO_2 fire extinguisher handling.	To review the HIRA document and do the needful. Needs to review

NO.	OBSERVATIONS	RECOMMENDATIONS
		periodically for the missing activities if any.
17.	The date expired cartridge masks available with both the departments. The line managers were also not aware about the shelf life of the cartridge masks.	The user dept/ safety dept. should carry out the department wise periodical inspection of the cartridge masks provided. The date expired PPEs must be discarded. To provide the training / refresher training to the concerned regarding use and storage of the cartridge masks.
18.	The portable O_2/ LEL detector's calibration due date was 04/07/2024 but was in use till date without calibration.	To calibrate these instruments frequently and put the valid inspection tags on it.
19.	SOP for handling of Hazardous chemicals mentions use dust masks for hazardous chemicals handling in the requirement column which is not suitable for the hazards associated.	To review the SOP in use and make necessary corrections for the PPEs use based on the hazards associated with these chemicals.
20.	Emergency exits available at both the areas but they were opening from inside.	Always ensure that the emergency exit doors openings must be from outside.
21.	Online H_2 & O_2 detectors were not installed in the central laboratory. H_2 gas being used in the Central Lab (Instrument Lab).	To install the H_2 & O_2 detectors in the central laboratory for online monitoring of the H_2 leakages, Oxygen deficiency.

NO.	OBSERVATIONS	RECOMMENDATIONS
22.	Oven Room – High temperature 375 °C maintained inside the oven. The heat-resistant hand gloves kept in that area were damaged ones, potential burn injury.	To dispose of such damaged hand gloves to avoid the potential burn injuries.
Safety department		
23.	Third party safety report of 2023 was available.	Compliance status was not available handy.
TFE - 1		
24.	An ISO container No. GPRU-960039(2) was in the process of filling the material Following observations • Static discharge cable not connected with container. • Filling line flanges were not provided with all bolts (Missing bolts).	• Procedural compliance to be ensured. • A good container filling checklist, if available then to be filled before starting the activity.
25.	Rubber hoses were well wound and kept on stand. PTW was being taken for hose connections was evident from record.	It's an excellent practice for process plant. It is recommended to Tag the hose by • Numbering • Service • Inspection schedule • Decontaminated
Canteen		

NO.	OBSERVATIONS	RECOMMENDATIONS
26.	Few electrical equipment had ELCB installed on electrical distribution boards. Few distribution board had no such provision of ELCB / RCCB for human protection.	Ensure all distribution boards are provided with ELCB / RCCB protection.
FG Warehouse		
27.	Rack pathway was blocked due to stacking on pathway. In case of any incident, it may be difficult to access the location.	All pathway must be kept clear.
28.	Huge stock of wooden pallet was stacked in WH. It is combustible material.	Avoid any flammable/ combustible material in WH.
Engineering stores		
29.	Wooden planks used for material storage. Few planks were found damaged/ bent.	Avoid wooden planks for keeping the material.
Chemical stores		
30.	Fire prevention / fighting arrangement: Beam detectors, Fire hydrant line / FEs available but water spray system is not provided.	To control the fire quickly and effectively, review for provision of water spray system.
31.	Spill kit was available but there was no evidence of training imparted for spill kit.	It is very important that the kit is always available and people trained for its usage. Special PPE if required during spill management, must be ensured handy.

NO.	OBSERVATIONS	RECOMMENDATIONS
32.	Few drums were kept on damaged wooden pallet on the rack. This is a highly unsafe condition.	Establish an inspection checklist for wooden pallet. Remove all damaged pallet.
33.	Use of spill containment pallet is not in practice.	It is recommended to slowly change over from wooden pallet to Spill containment pallet to control the high potential unsafe condition.
TFE Transformer 1, 3.5 MVA		
34.	HV terminal box double earthing not provided.	Provide earthing as per IS 3043.
35.	LV terminal box double earthing not provided.	Provide earthing as per IS 3043.
36.	Fire bucket stand does not have canopy.	Provide the same.
66 KV switchyard		
37.	Transformer to OLTC Silica Gel is exhausted. Main tank Silica Gel is also exhausted.	Maintain the equipment as per CEA 2023.
Boiler area		
38.	Railing is not provided on Elevated platform of Electrical panel.	Provide the same.

4.0 CHECKLIST COMPLIANCE AUDIT AS PER IS 14489:2018

Observations including non-conformities by the auditors are given below in Annexure B to C. Standard Requirements for the Audit are also suggested in the last column.

ANNEXURE – B (IS 14489:2018)

(Clause 5.3.3)

Types of Records to be examined during the Safety Audit

NO.	ITEMS	OBSERVATION & RECOMMENDATION
1.	2.	3.
1.	OS & H Policy	Available
2.	Safety Organization Chart	Available
3.	Training Records on Safety, Fire & First Aid	Available
4.	Record of Plant Safety Inspections	Available
5.	Accident Investigation Reports	Available
6.	Accidents & Dangerous Occurrences, Statistics & Analysis.	Available
7.	Record of Tests & Examinations of Equipment & Structures as per Statues	Available
8.	Standard Operating Procedures (SOP) for various Operations	Available
9.	Record of Work Permits	Available
10.	Record of Monitoring of Flammable & Explosives Substances at Work Place	Available

NO.	ITEMS	OBSERVATION & RECOMMENDATION
1.	2.	3.
11.	Maintenance & Testing Records of fire detection & fire fighting equipment	Available
12.	Medical records of employees	Available
13.	Records of Industrial Hygiene surveys (noise, ventilation levels, illumination levels, airborne & toxic substances, explosive gases).	Available
14.	Material Safety Data Sheet	Available
15.	On-site Emergency Plan & record of mock drills	Available
16.	Records of storage of hazardous solid waste disposal	Available
17.	Records of effluent discharges gaseous emissions and to the environment	Available
18.	Housekeeping inspection records	Available
19.	Minutes of Safety Committee meetings	Available
20.	Approval of layouts & other approval from statutory authorities	Available
21.	Records of any modifications carried out in plant or process.	Available
22.	Maintenance procedure records	Available
23.	Instrumentation and equipment Calibration & testing records	Available

NO.	ITEMS	OBSERVATION & RECOMMENDATION
1.	2.	3.
24.	Planned Shutdown maintenance procedures	Available
25.	In service inspection manuals, records including that of material handling	Available
26.	OH & S budget	Available
27.	Inspection books & other Statutory records	Available
28.	Records of previous Audits	Available
29.	Procedure for Safe transportation of hazardous substances	Available
30.	Calibration records	Available
31.	Records for breakdown of plants during the process of manufacture	Available
32.	Records for waste material generated and their disposal	Available
33.	SOP for disposal of waste materials	Available
34.	Records for issue of PPE items to the personnel working in process building.	Available

ANNEXURE – C (IS 14489:2018)

(Clause 5.3.4)

General Points

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
OH & S MANAGEMENT		
OH & S POLICY		
1.	Does the organization have OH & S policy?	Yes
2.	Who has signed the OH & S policy?	OH & S policy is signed by CEO of the company.
3.	Whether the OH & S policy is per guidelines of the statutory provisions?	Yes
4.	When was the OH & S policy declared and adopted?	01.01.2022
5.	Whether the OH & S policy reviewed periodically?	Yes
6.	Whether the OH & S policy is available in local language and made known to all?	Available in English language. OH & S policy should be available in Hindi/ Local language.
7.	What was the last date of updation?	01.01.2022
8.	Does the policy find a place in the annual report?	Yes
OH & S ORGANIZATIONAL SET UP		
SAFETY DEPARTMENT		
9.	Does the factory have a safety department and what is strength of safety department?	Yes Safety Department consists of 10 Members.

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
10.	Whether the strength and qualifications of Safety Officers are as per the statutes?	Yes
11.	Does the head of safety department report to the Chief Executive?	Yes Safety Department reports to CEO/ Factory Manager.
12.	How often are the safety officers retrained in the latest techniques of total safety management? What is the frequency of retraining?	As per requirement.
13.	What additional duties the safety officer is required to do?	No additional duties.
14.	What is the power of safety officer vis-a-vis unsafe condition or unsafe act?	To stop any dangerous operation. If there are any unsafe conditions or acts, these will be brought to the notice of the concerned HOD and in the case of imminent danger, the job stopped until unsafe conditions/ act were removed / corrected.
SAFETY COMMITTEE(S)		
15.	Does the factory have a safety committee(s)? What are the types, structures and terms of reference of the committees?	Yes 2 types of safety committee. Plant safety committee & Central safety committee.
16.	Is the constitution of the safety committee(s) as per the statute?	Yes

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
17.	How are the members of safety committee(s) selected? (elected / nominated)	Nominated.
18.	How often are the meetings of safety committee(s) held?	Plant safety committee meetings are held Every Month. Central safety committee meetings are held on Quarterly basis.
19.	Are the recommendations of the committees(s) implemented?	Yes The recommendations are implemented by action plan by respective department In-charge.
20.	Are the minutes of the safety committee(s) meetings circulated among the members?	Yes Minutes of safety committee's meetings circulated through e-mail.
21.	Are the minutes forwarded to the trade union(s) and chief executive and occupier?	Yes
22.	Whether the management and trade union play their active roles in supporting and accepting the committee(s) recommendations?	Yes
23.	How are the safety committee(s) members apprised of the latest development in safety, health and environment?	Regular training and video presentation at every meeting.
SAFETY BUDGET		
24.	What is the annual safety (EHS) budget?	Data available with Safety department.

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
25.	How much percentage is this budget of the total turnover of the company?	Data available with Safety department.
26.	How much budget has been utilized till date?	Data available with Safety department.
27.	Is the safety budget adequate?	Yes
28.	How is the safety budget arrived at?	As per actual requirement.
29.	What is the pattern of expenditure for the last five years?	Increasing pattern.
30.	What are the approved sanctions for the expenditure in this budget?	Expenses related to SHE.
31.	Does this budget get reflected in the annual report of the company?	Yes
SAFETY MANUAL		
32.	What is the periodicity of updation/ review of safety manual?	As per requirement or Every three years.
33.	Does the safety manual adequately address all the hazards in the plant?	Yes
34.	Are the employee made aware of safety rules/ instruction mentioned in the safety manual?	Yes Training is given.
STANDARD OPERATING PROCEDURES (SOP)		
35.	Are written Standard/ Safe Operating Procedures available for all operations and processes?	Yes Written Standard/ Safe Operating Procedures available for all operations and processes.
36.	Whether the written Standard/ Safe Operating Procedures are displayed or	Yes

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
	made available and explained in the local language to the workers?	Written SOPs are available in English language & explained in the local language to the workers.
37.	Whether concerned section and safety department prepares standard/ safe operating procedure jointly?	Yes
38.	Are standard/ safe operating procedures reviewed and updated?	Yes
39.	Have the workers been informed of the consequences of failure to observe the standard/ safe operating procedures?	Yes
PLANT MODIFICATION PROCEDURES		
40.	What is the system for effecting any change in the existing plant, equipment or process?	MOC (Management of change) procedure available.
41.	Whether the P & I diagram and other related documents are updated accordingly?	Yes
42.	Whether hazard assessment done before implementation of modification?	Yes
WORK PERMIT SYSTEM		
43.	What types of work permits exist in the factory?	• Hot Work Permit • General Work Permit • Excavation Work Permit • Confined Space Work Permit • Work at Height

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
44.	Are the necessary forms detailing required safety precautions have been prepared and used for each type of work-permit?	Yes
45.	Is the responsibility assigned to authorize person for issuing of safety work permit?	Yes Work Permit Authorization system available.
46.	Is the copy of safe work permit sent to safety officer before execution of the job?	Work Permit is Audited by safety officer.
47.	Is validity period specified in the safety work permit?	Yes Mentioned in work permit.
48.	Are the records of work permit available and maintained in proper order?	Yes
CONTROL MEASURES FOR WORK AT HEIGHT		
49.	Is adequate safe access provided to all places where workers need to work?	Yes
50.	Are all such access in good condition?	Yes
51.	Are all scaffolds properly designed and erected?	Yes
52.	Are scaffolds inspected every day before work begins?	Yes Visually inspected daily.
53.	Are ladders securely clamped or lashed in place?	Yes
54.	Are planks in good condition?	Yes
55.	Are scaffold walkways, platforms, runs or stairs free of debris, grease, any	Yes

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
	unnecessary obstruction and projecting nails?	
56.	Are the scaffolds higher than 20 m.? If yes, is netting or intermediate railing provided between toe-boards and hand railings?	Yes Necessary safety precautions are taken.
57.	Are folding stepladders properly used?	Yes
58.	Are ladders set up at the proper slope of about 1:4?	Yes
59.	Do workers use hand lines to lift tools or materials?	Yes Whenever required.
60.	Are proper ladders used around electrical hazards?	Yes
61.	On sloping roofs, are crawling boards, lifelines, safety belts and edge protection provided where needed?	Yes Necessary safety precautions are taken while carrying out work on roofs.
62.	Whether the weak spots, skylights, or deteriorated asbestos-cement boards through which a worker might fall while working in the roof has been identified and safety net provided appropriately?	No any situation available in site.
63.	Are the workers being medically examined for their fitness to work at height?	Yes
WORK IN CONFINED SPACE		

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
64.	Is work permit system followed for working in confined space?	Yes Refer Checklist No. 43
65.	Whether monitoring of the atmosphere inside the confined space is carried out and ensured that there is no flammable or toxic gas in the area?	Yes LEL level & O_2 level is checked inside the confined space before entry.
66.	Whether the person entering the confined space is using suitable Personal Protective Equipment's (PPE's)?	Yes All required PPEs are used during confined space work.
67.	Is rescue team available in case of any emergency?	Yes Emergency Response Team is available in case of any emergency.
CONTRACTORS' SAFETY SYSTEM		
68.	Is there any system for selection of contractors?	Yes SOP available.
69.	Are there any guidelines on contractor's safety and training?	Yes L1 training given by HSEF Team.
70.	Whether contract document includes necessary safety and welfare clauses as per statutes?	Yes
71.	Is there any programme to ensure use of PPE by contractor's personnel?	Yes
72.	Do the contractors have their own safety organization?	Yes, partially
73.	Are the contractors reporting all accidents and injuries?	Yes

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
74.	Are contractor workers trained to observe safety at work place?	Yes L2 Job specific Training is given.
75.	Whether contractor workers are engaged in process/ operations? If yes, are they aware of safe operating procedures?	No
PLANT DESIGN AND LAYOUT		
76.	Whether hazardous operations in the plant are segregated?	Yes
77.	Whether Occupational Health & Safety aspects are considered during the design?	Yes
78.	Are all the equipment's provided with adequate space for working, maintenance etc.?	Yes Adequate space provided for working, maintenance etc.
79.	Are the storage tanks provided with enough space/ clearance between them?	Yes
80.	Whether the plant layout has taken care of the movement of fire-fighting equipment and emergency exits?	Yes
MEDICAL MANAGEMENT OF ACCIDENTS		
81.	Are medical facilities available with trained first aid staff and equipment in round the clock shift for all including contractors?	Yes OHC is provided. FMO is available round the clock, Two male nurse and two ambulance drivers in each shift and one female nurse in general shift.

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
82.	Is the ambulance van available for round the clock basis with the dedicated driver?	Yes 2 Nos. of Ambulance van available with drivers.
83.	Is there any mutual aid scheme available with the nearest hospitals to manage and treat injuries during emergency?	Yes
84.	Are the workers/ contractor workers aware of emergency medical facilities?	Yes
MANAGEMENT OF EMERGENCIES (NATURAL/ MAN-MADE)		
85.	Does the system exist to detect and control these Emergencies?	Yes Emergency Response Plan is in place.
86.	Are the employees aware of the measures to be taken during emergencies?	Yes The employees are aware through Mock Drill & OSEP Training on regular basis.
EMPLOYEES SELECTION AND PLACEMENT		
87.	Whether norms are available for selection of different category of employees?	Yes Different categories of employees are selected by Technical + HR Department.
88.	Whether pre-employment medical examination is being conducted for employees?	Yes Form No. 33 of all employees is available.
89.	Is there any procedure to evaluate safety awareness and record of the employees during their promotion?	Yes
SAFETY CULTURE		

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
ATTITUDES OF MANAGERS		
90.	Do the managers follow the plant safety rules at all times?	Yes
91.	What are their attitudes towards safety reviews and audits?	Positive attitude towards safety reviews & audits and enhancement of the safety.
92.	What is the response of management to safety violation?	CSR Policy available.
93.	Whether safety related decisions are taken in consultation with the workers?	Yes
94.	What is the attitude of the managers towards non-use of personal protective equipment?	Positive attitudes by the managers regarding use of PPEs and following the safety regulations of the plant.
ATTITUDES OF WORKERS		
95.	Whether workers are aware of the consequences of their wrong actions?	Yes
96.	Are laid down safe working procedures followed strictly?	Yes
97.	What is the attitude of the workers towards their own mistake, which can prejudice safety?	Positive attitude towards acceptance of their own mistake.
98.	Do the workers report near miss incidents and suggest safety improvements?	Yes
99.	Are the workers aware of the system of rewards and sanctions relating to safety matters?	Yes

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
100.	What is the attitude of workers towards use of personal protective equipment?	Positive attitude towards use of PPEs.
STATUTORY LICENSES, APPROVALS AND RECORDS		
101.	Whether all the Safety Related Acts/ Rules (with latest amendments) applicable to your organization identified, informed to all employees and complied?	Yes Legal aspect register is prepared & responsibilities are identified.
102.	Whether the licenses have been validated?	Yes
MOTIVATIONAL AND PROMOTIONAL MEASURES FOR OH & S		
103.	Does the factory have occupational health and safety suggestion scheme?	Yes HSE department has prepared occupational health and safety suggestion scheme.
104.	Are Occupational Health and Safety contests organized in the factory?	Yes During safety Month celebration.
105.	Does the factory participate in National Awards?	Yes
106.	Has the factory been awarded during last five years?	No
107.	Does the organization publish safety bulletin/ newsletters?	Published by mail.
108.	Whether the safety bulletins are widely distributed?	Yes
109.	How is the Occupational Health and Safety information including accident	Through Bulletin boards, Newsletter, Mails.

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
	statistics disseminated in the factory? (Bulletin boards, Newsletter etc.)	
110.	What are the activities conducted during National Safety day/ week?	External training, First aid training, Safety quiz, safety slogan quiz, safety poster quiz etc.
111.	What is the percentage of Workers participating in the various safety promotional activities?	Majority Workers participating in the various safety promotional activities.
HAZARD IDENTIFICATION AND JOB SAFETY ANALYSIS		
112.	Was an initial Process Hazard Analysis (PHA) completed?	Yes
113.	What are the stages of PHA? Whether a dedicated group is identified for PHA?	PT & PHA Subcommittee, PSM Subcommittee, PSM coordinators from each process plant.
114.	Was the PHA appropriate for the complexity of the process and identify, evaluate, and control the hazards involved in the process?	Yes
115.	Does the hazard evaluation use one or more of the following PHA methodologies: What-If Analysis, Process Checklist, Hazard and Operability Study (HAZOP), Failure Mode and Effects Criticality Analysis (FMECA), Fault Tree Analysis (FTA) or any other appropriate equivalent methodology?	**1.** HAZOP **2.** Process Checklist **3.** External Safety Audit

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
116.	Does PHA assure addressing issues of inherent safety features with respect to material and their properties?	Yes
117.	Does the PHA address the hazard identification, incidents history, consequences of failures (engineering and administrative controls), human factors, consequent analysis with respect to possible safety and health effects of failure of controls?	Yes
118.	What are the stages of PHA? Whether a dedicated group is identified for PHA?	Refer Checklist No. 113.
119.	Does the system exist to promptly address findings and recommendations of PHA?	Yes Tracking of data by PT & PHA Subcommittee.
120.	Are the PHA's updated and revalidated at least every five years by a qualified team to assure that the PHA is consistent with the current process?	Yes
121.	Whether the activities requiring Job Safety Analysis have been identified?	Yes
122.	Whether the identified jobs for Hazard Identification have been carried out by trained and experienced persons?	Yes Hazard Identification have been carried out by trained and experienced persons. Records are maintained.
123.	Whether the checklists have been prepared on each Job Safety Analysis	Yes

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
	and are being used while carrying out the job?	
PRODUCT SAFETY		
124.	Whether hazards arising from use of the products are identified?	Yes
125.	Whether Material Safety Data Sheet prepared for the products?	Yes MSDS is available with respective departments.
126.	Are all the products labelled and packed appropriately?	Yes
127.	Whether safety instructions are given along with products?	Yes Products are labeled properly to identify the details & hazards related to it.
128.	Whether policy exists for recall of products?	Yes Quality Policy is available.
SAFETY TRAINING		
129.	Whether training needs have been identified?	Yes Training calendar Excel based available for HSE training / at E&T department.
130.	Is there any programme of induction training, its duration and topics covered?	Yes Induction Training is given for 2 hours.
131.	Whether the assessment of the trainees has been carried out?	Yes

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
132.	What are the infra-structural facilities available for training?	Dedicated Conference Room and training Hall available.
133.	Whether training is conducted by qualified person?	Yes
134.	Whether trainers are being re-trained from time to time?	Yes
135.	Whether proper records of training program conducted are maintained?	Yes
136.	How training programs are evaluated?	By written and practical exam.
137.	Whether schedule for training on Occupational Health and Safety is available and maintained?	Yes Training calendar available.
138.	Whether the training programmes are reviewed?	Yes Training programs are reviewed on regular basis.
139.	Are all the employees periodically trained/ retrained and what is the frequency of such training?	Yearly.
140.	Are the retraining needs identified whenever a new process/ products and change in existing process introduced?	Yes Training programs are reviewed on regular basis.
141.	Whether training covers top management?	Yes
142.	How many hours of safety training is given to different employees?	About 3 man days internally conducted.
CHANGE MANAGEMENT		
MANAGEMENT OF CHANGE		

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
143.	Are there written procedures for managing change to process chemicals, technology, equipment and procedures and changes to facilities that affect the plant process/ system operation?	Yes Written Procedure is available.
144.	Do the procedures assure that the technical basis for the proposed change addressed prior to any change?	Yes
145.	Do the procedures assure that the impact of the change on safety and health addressed prior to any change?	Yes
146.	Do the procedures assure that modifications to operating procedures are addressed prior to any change?	Yes
147.	Do the procedures assure that the necessary time period for the change is addressed prior to any change?	Yes
148.	Do the procedures assure that the authorization requirements for the proposed change are addressed prior to any change?	Yes
149.	Are employees involved in operating a process, and maintenance and contract employees whose job tasks will be affected by change informed of, and trained in, the change prior to the start-	Yes

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
	up of process or affected part of process / operations?	
150.	Is the safety information reviewed and updated on changes?	Yes Reviewed & Updated as per Requirement.
151.	Are the operating procedures or practices updated?	Yes
MECHANICAL INTEGRITY		
152.	Does the mechanical integrity program include for all mechanical equipment including pressure vessels and storage tanks, piping and components, relief devices and vent systems, emergency shutdown systems, pumps, control systems?	Yes MIQA committee is formed.
153.	Are there written procedures to maintain the on-going integrity of process equipment?	Yes SOP is available.
154.	Whether training been provided to each employee involved in maintaining the on-going integrity of process equipment?	Yes Training Records are available.
155.	Are inspections and tests performed on each item of process equipment included in the program?	Yes Inspections and tests Records are available.
156.	Do the inspection and test frequencies meet the manufacturer's	Yes

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
	recommendation and good engineering practice?	Inspection and test frequencies meet the manufacturer's recommendation.
157.	Are inspections and tests performed more frequently if determined necessary by operating experience?	Yes In case required.
158.	Are deficiencies in equipment that are outside limits corrected before further use so as to assure safe operation?	Yes Corrected before further use.
159.	In the construction of new plants and equipment, whether quality assurance programme is implemented to ensure that equipment fabricated is suitable for the process?	Yes
160.	Are appropriate checks and inspections made during equipment installation stage?	Yes
161.	Are the suitability of maintenance materials, spare parts and equipment ensured during maintenance?	Yes
PHYSICAL HAZARD		
HOUSEKEEPING		
162.	Are all the passages, floors and the stairways in good condition?	Yes
163.	Is glass door taped or otherwise marked to make it visible to workers?	Yes
164.	Do you have the system to deal with the spillage?	Yes

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
		Dry sand, spill kit, absorbent is available.
165.	Do you have sufficient disposable bins clearly marked and whether these are suitably located? Are containers of refuse (waste) and trash emptied at the end of every day or soon after they are full? Are the containers or bins regularly cleaned?	Disposable bins are placed at prominent places clearly marking for different categories of wastes like metallic, plastic, wooden etc.
166.	Are drip trays positioned wherever necessary?	Yes
167.	Do you have adequate localized extraction and scrubbing facilities for dust, fumes and gases? Please specify.	Yes
168.	Whether walkways are clearly marked and free from obstruction?	Yes
169.	Do you have any inter-departmental competition for good housekeeping?	Yes
170.	Has your organization elaborated good housekeeping practices and standards and made them known to the employees?	No
171.	Are there any working conditions, which make the floors slippery? If so, what measures are taken to make them safe?	Yes Spill kit available.

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
172.	Does the company have adequate measures to suppress polluting dust arising out of materials stored on the roadside?	Yes
MACHINE AND GENERAL AREA GUARDING		
173.	Whether machinery and equipment which can cause physical injuries to operator have been identified?	Yes
174.	Are all moving parts and point of operation of machinery adequately guarded?	Yes
175.	Are all fixed guards securely bolted in position and in good condition?	Yes
176.	Are all interlock guards for prevention of physical injury in good condition?	Yes
177.	Are all emergency stop buttons effective and clearly labelled?	Yes
178.	Are the operators for machines having moving parts aware of the danger of working with loose clothing?	Yes
179.	Are the openings where there is free fall hazard covered or fenced securely?	Yes All the openings where there is free fall hazard are covered with railing and toe guard.
MATERIAL HANDLING		
180.	Are adequate equipment's available for handling materials?	Yes

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
181.	Are the workers aware of the hazards associated with material being handled?	Yes Training is given.
182.	Where manual handling is necessary, are the workers been trained? Do they practice this? Are workers warned for lifting of excessive weight? (Maximum weight of material for adult male and female are 55 Kg and 30 Kg respectively)	Yes Training and TBT given on regular basis.
183.	Do workers follow safe procedures for storage of materials?	Yes
184.	Is the register maintained to record particulars of examination of all lifting machines, tools and tackles?	Yes Examination is carried out through Competent Person & Maintained in Form No. 9 & 10.
185.	Are all the statutory examinations and tests carried out and certified by competent person(s)?	Yes Maintained Updated for all the statutory examinations & tests carried out by Competent Person.
186.	Are the operators of crane, lifts, hoists and other mechanized operations adequately qualified?	Yes
187.	Is the Safe Working Load clearly marked?	Yes
188.	Has the person employed to operate crane, forklift, or to give signals to crane been medically examined for eyesight and colour vision?	Periodical Medical Checkup is carried out on half yearly basis. As well as Pre-Medical Check-up is also carried out during new joining.

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
189.	Is the frequency of eyesight and color vision examination as per the latest rules?	Yes Periodical Medical Checkup is carried out.
ELECTRICAL SAFEGUARDING		
190.	Are licensed electricians available for electrical work?	Yes
191.	Whether area classification for electrical equipment has been carried out?	Yes Hazardous Area Classification (HAC) is carried out.
192.	Do the electrical fittings conform to area classification for electrical equipment?	Yes Hazardous Area Classification (HAC) is carried out and Flameproof electrical fittings are installed accordingly.
193.	Is a ground fault current interrupter system (ELCB) in use?	Yes ELCB, MCB & RCB being used wherever required.
194.	Are all connections made by using appropriate plugs, receptacles or enclosures? Are fuses provided?	Yes Industrial plugs being used.
195.	Are there any make shift connection bare wires or damaged cables?	No
196.	Is there a system of ensuring periodical inspection of hand tools, extension boards used for electrical work?	Yes Monthly inspection schedule available.
197.	Do the workers use proper types of PPE during the working on live line?	NA

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
		No employee is allowed to work on live wires, Full energy isolation is required to perform and job on machine and maintenance job is done only by authorized electrician.
198.	Is the separate work permit issued for working on high voltage line?	NA No employee is allowed to work on live wires, Full energy isolation is required to perform and job on machine and maintenance job is done only by authorized electrician.
199.	Whether the process(s) and equipment that generate and accumulate static charge have been identified?	Yes
200.	Whether all such equipment including pipelines for flammable materials are properly bonded and earthed?	Yes All such equipment including pipelines for flammable materials are properly bonded and earthed.
201.	Whether earth pit resistance is measured and the record maintained?	Yes Yearly inspection by electrical department, records are maintained.
202.	Whether lightning arrestor has been installed and is adequate?	Yes
SAFETY IN STORAGE AND WAREHOUSING		
203.	Whether the Material Safety Data Sheet for all chemicals is available?	Yes

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
204.	Are the chemicals stored as per their hazardous properties including the incompatibility?	Yes Chemicals stored as per the compatibility of the hazardous properties.
205.	Are all containers clearly, indelibly labelled? Are all chemicals stored as per safety regulations?	Yes
206.	Whether all racks and steel cages have sufficient load bearing capacity?	Yes
207.	Is adequate natural ventilation provided to store room? Is there any emergency exit?	Yes Emergency Exit is provided.
208.	Whether adequate fire-fighting arrangement existing in flammable chemical storage?	Yes **1.** Fire Hydrant System **2.** Fire Monitors **3.** Fire Extinguisher's **4.** Hose Reel **5.** Sand Buckets
209.	Whether methodology for handling spillages of hazardous chemical available along with the equipment required handling the spillage?	Yes Written procedure for spillages of hazardous chemicals is available. Spillage kit & Sump is available for collection of spill.
210.	Whether aisles are marked and emergency exits displayed?	Yes
HAZARD ASSESSMENT FOR NEW EQUIPMENT		

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
211.	What is the system for effecting any change in the existing plant, equipment?	MOC System followed for change control.
212.	Is there system for evaluating hazards from new equipment?	Yes
213.	Whether the P and I diagram and other related documents are updated accordingly?	Yes
214.	Is any Job Hazard Analysis (JHA)?	Yes
HAZARDS FROM RADIATION SOURCES		
215.	Whether licences have been obtained for storage / handling of radioactive material?	No such materials used in the factory.
216.	Whether approved Radiological Safety Officer appointed?	Not Applicable
217.	Whether appropriate PPEs are used against radiation hazards?	Not Applicable
218.	Is the flooring of the radioactive material handling area amenable for proper decontamination?	Not Applicable
219.	Is the storage room of radiation source as per the licence condition?	Not Applicable
220.	Are all persons working in the facility have radiation safety training?	Not Applicable
221.	Is the operator handling devices using radioactive materials qualified and possess the necessary certificate?	Not Applicable

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
222.	Is the periodical radiation monitoring carried out?	Not Applicable
223.	Are the records of inventory of radioactive material maintained in the standard format and submitted to the competent authority as per the period specified?	Not Applicable
224.	Are emergency handling tools available?	Not Applicable
225.	Are the personnel monitoring badges (TLD, Pocket dosimeter etc.) assigned and worn by each radiation worker?	Not Applicable
226.	Are the radiation symbol and red light displayed as required?	Not Applicable
CHEMICAL HAZARD		
TRANSPORTATION OF HAZARDOUS SUBSTANCES		
227.	What potentially hazardous materials are transported to or from the site (including wastes)	Refer Section 3.3.1 & 3.3.2
228.	What modes of transport are used? **1.** Road, **2.** Rail & **3.** Pipelines	**1.** Road
1) ROAD		
229.	Does the company employ licensed vehicle of its own/ outside sources?	The Company has hired licensed vehicle by out sourcing.

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
230.	Are the loading/ unloading procedures in place and safety precautions displayed?	Yes Standard Operating Procedure is followed for loading & unloading of material.
231.	Is there a provision to check the healthiness of road tanker with respect to explosives rules?	Physically checked at gate.
232.	Are loaded tankers or trucks parked in a specific area on-site?	Yes Loaded tankers or trucks parked in a specific area on-site.
233.	Do all truck and tanker drivers carry transport emergency (TREM) card or instruction booklet?	Yes
234.	Do all truck and tanker drivers get training in handling emergencies during transport?	Yes Training records are available.
235.	Are all the tankers marked for proper HazChem code?	Yes
2) RAIL		
236.	What hazardous materials are transported by rail?	Material is not transported by rail.
237.	Does the company have a direct siding on site?	Not Applicable
238.	Are tankers or other wagons used in transportation?	Not Applicable
3) PIPELINES SITE TO OUT SITE		

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
239.	What materials are transported to and from the site by pipelines?	Material is not transported through pipelines.
240.	Are the pipelines underground or over ground?	Not Applicable
241.	Are corrosion protection measures employed in pipelines?	Not Applicable
242.	Whether intermediate booster pumps are used?	Not Applicable
243.	What is the maximum, minimum and average transfer rate?	Not Applicable
244.	Are the pipelines extended in the public domain?	Not Applicable
245.	Are the pipelines dedicated for each type of chemicals?	Not Applicable
246.	Are the pipelines fitted with safety equipment such as leak detectors, automatic shut-off valves etc.?	Not Applicable
247.	What is the frequency and method of testing of the pipeline?	Not Applicable
248.	Is there written procedure for tackling leakages in pipeline?	Not Applicable
HANDLING OF HAZARDOUS SUBSTANCES		
249.	What are the hazardous substances handled in the factory?	Refer Section 3.3.1 & 3.3.2
250.	Whether quantity of hazardous substances is above the threshold limit specified in the Manufacture, Storage	The quantity of Vinylidene Fluoride (VDF) & R142b is more than the threshold limit specified in the

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
	and Handling of *Hazardous Substances Rule*, 1989? If yes, then required documentation is available as per the rule.	Manufacture, Storage and Handling of *Hazardous Substances Rule*, 1989. Required documentation is available as per the rule.
251.	Whether written procedure for handling the hazardous substance is available and operators are trained for handling such substances including actions required in case of leakages and spillages?	Do's and Don'ts displayed & SOP is available, Training provided.
252.	Are the employees aware of the hazards arising from hazardous substances and safety precautions to be taken during handling of these?	Yes Training provided.
MATERIAL SAFETY DATA SHEETS (MSDS)		
253.	Are the Material Safety Data Sheets available for all the chemicals handled, used and manufactured in the factory?	Yes
254.	Whether the latest MSDS are displayed at strategic locations?	MSDS are displayed at respective department.
255.	Is it available in local language?	Yes
SPILL CONTROL MEASURES		
256.	Whether spill control procedure is available?	Yes
257.	Whether spill collection pit/ sump is available at the workplace?	Yes

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
258.	Whether methodology for recovery/ disposal of collected material has been established?	Yes SOP available for collected material.
STORAGE OF HAZARDOUS SUBSTANCES		
259.	Whether storage vessels are identified with the capacity as required under *MSIHC, Rules* 1989.	Yes
260.	What are the storage pressure and temperature?	VDF is stored at 12.24 kg/ cm^2 pressure. R142b is stored at 4.5 kg/ cm^2 pressure. R23 is stored at 17 kg/ cm^2 pressure. R22, HFP & R125 is stored at 12.24 kg/ cm^2 pressure. Liquid Nitrogen is stored at 37.72 & 24 kg/ cm^2 pressure.
261.	Whether vessels are above ground/ underground?	Above ground.
262.	If any of the tanks storing flammable material, whether electrical equipment and fittings are as per electrical area classification?	Flameproof electrical fittings are installed as per electrical area classification.
263.	Is the bunded area takes into account the total quantity of the largest tank?	Yes Dyke Wall is made.
264.	Whether the bund perimeter takes into consideration of trajectory of leak from tank?	Yes

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
265.	Are the vessels properly bonded and earthed and whether periodically checked and record maintained?	Yes
266.	Are the vessels fitted with remotely controlled isolation valves?	Yes
267.	Are vessels provided with emergency vent, relief valve, bursting disc, level indicator, pressure gauge and overflow line?	Vessels are provided with emergency vent, relief valve, bursting disc, level indicator, pressure gauge, overflow line as required.
268.	Where do such vents discharge?	To the atmosphere.
269.	Are the vessels provided with alarms for high level, high temperature and high pressure?	Yes Vessels are provided with alarms for high level, high temperature and high pressure as required.
270.	Are standby empty tanks or any other alternate systems provided for emptying/ transfer in case of emergencies?	Yes
271.	What are the provisions made for fire-fighting/ tackling emergency situations around the storage vessels?	• Fire Hydrant System • Fire Extinguisher's • Foam Monitors • Sand Buckets
272.	Has any consequence analysis for loss of containment been carried out?	Yes
273.	Whether the vessels are tested as per statute?	Yes

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
274.	Whether log sheets are filled up on daily basis for recording the parameters of these vessels?	Yes
275.	Whether monitors for detection of leakage of flammable/ toxic material installed?	Yes
276.	Whether the chemicals stored are as per their compatibility?	Yes
GAS CYLINDERS		
277.	What are the various gas cylinders used in the plant?	• Air • Hydrogen • Oxygen • Argon
278.	Are valid licenses available for storing all these cylinders?	Yes
279.	Are the cylinders stored and segregated as per their compatibility?	Yes
280.	What are the measures taken for combating any emergency in the cylinder's storage area?	SCBA set, Fire hydrant system, fire extinguisher available.
281.	Whether integrity test certificates are obtained from the suppliers of the cylinders?	Yes
282.	Are the cylinders chained and secured properly along with the valve caps and proper identification colour code?	Yes Cylinders are chained and secured properly along with the valve caps and proper identification colour code.

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
283.	Are the cylinders protected from heat or sun and rain?	Yes Kept in Shaded Area.
284.	Whether monitors for detection of leakage of flammable / toxic gas installed?	Yes Fixed GDS.
LABELING AND COLOR CODING		
285.	Are all the containers, vessels and storage tanks labelled for its content and capacity?	Yes
286.	Whether the pipelines are colour coded as per IS 2379?	No
287.	Is any plant specific colour code followed?	Yes
288.	Whether the color codes are displayed conspicuously in the working areas?	Colour coding display boards are available.
HAZARDOUS WASTE MANAGEMENT		
289.	Is identification done for various types of hazardous wastes?	Yes Identification done As per GPCB Norms.
290.	Are these quantities less than those specified by the Hazardous Wastes (Management & Handling) Rules, 1989?	Yes Maintained as per the Norms.
291.	What are their disposal modes?	Disposed off with the help of Registered Agencies like BEIL, BWML etc.

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
292.	What are the systems / measures adopted for controlling air / water / land pollution?	Full fledge ETP, form 37 maintained, Storm water drain is available not connected to process line.
293.	Whether the solid waste like combustibles, plastic, metals etc. segregated?	Yes Segregated as per GPCB norms.
FIRE AND EXPLOSION HAZARD		
ORGANIZATIONAL SET-UP FOR FIRE FIGHTING		
294.	What is the total strength of fire station and fire crew?	37 Nos.
295.	How many fire crews are available in each shift?	10 Nos.
296.	Is there fire squad identified in each shift?	Yes
297.	Standing fire order is available with latest revision	Yes
298.	How is the communication with fire station?	Through Mobile Phones.
299.	Does fire safety inspections carried out?	Yes
300.	Does emergency procedure available for leakage or combustion of flammables?	Yes On-site emergency plan available & reviewed and update periodically.
301.	What measures are available to control the fire load in the plant area?	Fire Hydrant System, Sprinklers, Fire Extinguishers, Foam Monitors etc.
302.	Whether technical knowledge and skills of the manager and staff responsible for overall fire safety of the plant is adequate?	Yes

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
303.	How many major and minor incidents/ fires were there in the factory during the last five years? Give department/ plant wise.	Data available with Safety department.
304.	Have all the fires/ incidents been investigated and corrective actions taken? Give break-up.	Data available with Safety department.
305.	Resources: **1.** Adequacy of protective clothing (coat, trouser, gloves, boots and helmets); **2.** Availability of SCBA for fire-fighting operations and spare cylinders (at least 2 for each SCBA); **3.** Adequacy of hose, nozzles, ladders, lighting equipment and pumps; and **4.** Communication facility at fire station, walkie talkie sets during fire-fighting.	**1.** Adequate PPEs are available. **2.** SCBA sets available. **3.** Adequacy of Fire Hydrant system is proper. Maintained in Healthy condition. **4.** Mobile Phones & Walkie Talkie.
BUILT IN SAFETY IN CIVIL DESIGN AND CONSTRUCTION		
306.	Whether the two safe means of escape available? Are they in separate directions?	Yes
307.	Is emergency exits provided to the building handling flammables?	Yes
308.	Whether emergency lights are provided?	Yes

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
309.	Whether fire/ smoke detectors are installed in fire prone areas?	Yes
310.	Whether fire call points are provided in different areas?	Yes
311.	Whether Fire hydrants are provided near the buildings?	Yes
312.	Is ventilation system in plant handling flammables is adequate to prevent formation of flammable mixtures?	Yes
313.	Is adequate separation is provided between combustible/ flammable materials and other material to restrict the fire growth?	Yes
314.	Access routes for fire fighting operations is available for areas having high fire load?	Yes
315.	Whether building changes interferes with fire detection and/ or fire suppression systems?	No
316.	Whether building changes cause unreasonable fire loading/ openings in the fire rated walls?	No
BUILT IN SAFETY IN ELECTRIC CIRCUITS AND EQUIPMENT		
317.	Are the electrical equipment in areas where flammables mixture is likely to be present of flame-proof type?	Yes Flame-proof electrical fittings are installed.

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
318.	Are lightning arrestors are provided to the buildings/ structures storing flammable materials?	Yes
319.	Whether adequate bonding and grounding of electrical equipment/ pipelines provided?	Yes
EXPLOSIVE SUBSTANCES		
320.	Whether necessary license/ approval taken from concerned statutory bodies?	Necessary license/ approval taken from concerned statutory bodies.
321.	Whether systems for explosion suppression, high speed fire detection with deluge, sprinklers, explosion venting etc. are provided?	Fire hydrant, sprinklers, MCP, Fire monitor etc. are provided.
322.	Whether explosion resistant walls or barricades are provided around explosive storage?	Yes
323.	Whether explosive substance storage areas are restricted for entry?	Explosive substance storage areas are restricted for entry.
324.	Whether only trained persons are handling explosive substances?	Yes
325.	Whether explosive substances are stored and transported in approved containers only?	Yes
326.	Whether electrical fixtures in areas handling explosives are explosion proof type?	Yes Regular periodically inspection of flame proof electrical fixtures is carried out & records are maintained.

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
327.	Whether adequate measures are taken to prevent any sources of ignition where explosive substances are handled?	Yes
FIRE SAFETY IN HANDLING FLAMMABLE AND EXPLOSIVE MATERIALS		
328.	Whether emergency procedure is available for control of leakage?	Yes
329.	Whether emergency measures are displayed locally in case of accidental spillage/ leakage?	Yes Safety Board are displayed.
330.	Whether facility is provided for safe drainage of combustible or flammable liquids in case of leakages?	Yes Collection pit available.
331.	Whether highly flammable liquids are stored under inert atmosphere?	Yes
332.	Whether flammable storage tanks are provided with flame arrestors?	Yes
333.	Whether suitable PPE's are provided?	Yes
FIRE DETECTION AND ALARM SYSTEM		
334.	What type of fire detection and alarm system provided?	Yes
335.	Whether all fire prone areas of the plant are covered with fire detection system?	Yes
336.	Whether fire detection equipment and smoke alarms in good operating condition?	Yes

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
337.	Whether the numbers of fire call points are adequate and free from obstruction?	Yes
338.	Whether regular inspection/ maintenance/ testing of fire detection and alarm system carried out and records maintained?	Yes Inspection/ maintenance/ testing of fire detection and alarm system carried out on Monthly basis & records maintained.
339.	Whether any atmospheric monitoring is carried out for explosive mixture of gases or vapours?	Yes
340.	Whether emergency power supplies are provided to fire detection and fire alarm system?	Yes
341.	Whether smoke detectors are located considering ventilation pattern?	Yes
342.	Whether annunciation of fire is local or in the control room or in both places?	Annunciation of fire is local and in the control room both places.
343.	Whether fire panel is constantly attended?	Yes
PASSIVE AND ACTIVE FIRE PROTECTION SYSTEM		
344.	What are the passive fire protection measures available? (Barriers, Doors, Dampers etc.)	Yes
345.	Are the areas requiring fire barriers identified?	Yes
346.	Whether the fire barrier provided is of adequate ratings?	Yes

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
347.	Whether ventilation ducts in flammable areas have been provided with isolation dampers of suitable fire rating?	NA
348.	Whether sprinklers/ deluge are installed wherever necessary?	Yes
349.	Whether regular inspection/ maintenance/ testing of fire protection system carried out and records maintained?	Yes
FIXED FIRE EXTINGUISHING SYSTEM		
350.	What are the sources of firewater and whether they are dedicated to the fire extinguishing system?	2500 KL: 2 Nos. of water lagoon at Pump House - A & 508 KL: 3 Nos. of FRP Tank Pump House - B is dedicated to the fire extinguishing system.
351.	Whether the capacity of dedicated water reservoir is adequate to supply to hydrants for minimum 2 h?	Yes
352.	Whether un-interrupted power supply is provided to the firewater pumps?	D. G. Set is available. Diesel operated Pump is also provided.
353.	Whether the extinguishing medium selected is appropriate to the class of fire (water, gaseous, foam, dry powder)?	Yes
354.	Whether fire hydrants layout is available?	Yes

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
355.	Whether additional (over minimum requirement) fire hoses, nozzles are available?	Yes
356.	Whether the hydrants lines are kept pressurized?	Yes 7.0 kg/cm^2 pressure maintained in hydrant lines.
357.	Whether regular inspection / maintenance / testing of fixed fire extinguishing systems carried out and records maintained?	Yes Maintenance, Inspection and testing carried out by Third party. Records are available.
PORTABLE FIRE EXTINGUISHING SYSTEM		
358.	Whether suitable type and numbers of fire extinguishers provided?	Yes
359.	Whether the fire extinguishers are located at conspicuous position and easily accessible? Are they fully charged and tagged?	Yes Located at conspicuous position & Easily accessible. Tagged & Fully Charged.
360.	Whether fire extinguishers periodically inspected, tested, refilled and records maintained?	Yes Inspection of fire extinguishers is done on regular basis. Records are also maintained.
361.	Whether defective/ unchecked fire extinguishers present at site?	No such Fire Extinguishers are available at Site.
362.	Whether additional fire extinguishers are available?	Yes Additional Fire Extinguishers are available at Site.
FIRE FIGHTING EQUIPMENT AND FACILITIES		

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
363.	Whether fire tenders (water/ foam) are available?	Yes.
364.	Whether the fire-fighting system and equipment approved, tested and maintained as per relevant standard?	Yes
365.	Whether the SCBA/ fire suit provided to fire fighting team for immediate action?	Yes
366.	What is system for maintenance/ recharge of SCBA?	Maintenance/ recharge of SCBA set is done on regular basis.
367.	Is proper access available for fire fighting equipment?	Yes
368.	Whether fire hose cabinets are in good condition, easily visible, and accessible?	Yes Maintained in Healthy condition.
369.	Whether drill tower is available? Are fire personnel carrying out regular fire drill?	Drill tower is not available. Fire Drills are conducted Quarterly.
370.	What is the communication facility at fire station? Is it adequate?	Mobile Phones, Telephones & Walkie Talkie available.
FIRE DRILL		
371.	Whether mock fire drills are conducted? What is the frequency of drills?	Yes Fire Drills are conducted Every Month.
372.	Whether fire drills are also performed in night shift?	Yes
373.	Whether feedback of fire drill is documented?	Yes
374.	What is the system of mutual-aid scheme?	Mutual Aid scheme available.

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
FIRE FIGHTING TRAINING		
375.	Whether there is a system of providing fire-fighting training to plant personnel?	Yes
376.	What is the frequency and duration of such training? Whether training records are maintained?	2 Hrs./month Fire-fighting training is provided to plant personnel every month (2 Hrs./month). Records are available.
377.	Whether fire squads are identified for different areas for first-aid fire fighting and rescue, and suitably trained?	Yes Fire squads are identified for different areas for first-aid, fire fighting and rescue, and suitably trained.
378.	Are all personnel conversant with the fire prevention and protection measures?	Yes
379.	Whether the fire staff are sent for refresher / advanced training courses?	Yes
STATIC ELECTRICITY AND LIGHTNING		
380.	Whether all vessels and pipes are provided with suitable bonding and grounding?	Yes All the vessels and pipes are provided with suitable bonding and grounding.
381.	Whether arrangement has been made for grounding the tanker containing flammable liquid during loading / unloading?	Yes
382.	Whether spark resistant tools are provided?	Yes
383.	Whether lightning protection is provided and is adequate?	Yes

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
384.	Whether antistatic clothing, hand gloves and footwear are provided?	Yes
PRESSURE RELIEF SYSTEM		
385.	Whether the listing of all 'pressure plants' [as defined under *Factories Act*] has been done?	Yes Form No. 11 is Maintained.
INDUSTRIAL HYGIENE / OCCUPATIONAL HEALTH		
VENTILATION		
386.	Whether any ventilation study has been carried out?	Yes Ventilation study is carried out by 3rd party agency.
387.	Whether natural ventilation is adequate or not?	Yes Natural ventilation is adequate.
388.	Whether dust/ fumes/ hot air is generated in the process?	Yes
389.	Is there any exhaust ventilation system in any section of the plant?	Ventilation duct is provided.
390.	Is periodic/ preventive maintenance of ventilation system carried out and record is maintained?	Yes Records are Maintained.
391.	Does any ventilation system re-circulate the exhausted air in work areas?	No
392.	Is the work environment assessed and monitored for chemical and physical hazards?	Yes Monitoring for Chemicals is carried out & records maintained in Form No. 37.

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
393.	Whether PPE are provided to workers exposed to dust / fumes and gases?	Yes Dust Masks are provided.
ILLUMINATION		
394.	Whether illumination study has been carried out for the assessment of illumination level?	Yes
395.	Is there any system of periodical cleaning and replacing the light fittings/ lamps in order to ensure that they give the intended illumination levels?	Yes
396.	Are the workers subject to periodic optometry tests and records maintained?	Yes
397.	Are emergency lighting available at first aid center?	Yes
NOISE		
398.	Whether any noise study conducted?	Yes
399.	Are there any machines/ processes generating high-noise?	Yes DG set, Compressor, Blower etc. generates high noise.
400.	Whether engineering and administrative controls been implemented to reduce noise exposure below the permissible limits?	Yes
401.	Is there a system of subjecting all those employees to periodic audiometric test who work in high-level noise areas?	Yes

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
402.	Whether the workers are made aware of the ill effects of high noise?	Yes
403.	Whether ear muffs / plugs are provided and used?	Ear Plugs/ Ear Muffs are provided and used in high level noise area.
VIBRATION		
404.	Are there equipment which contributes excess level of vibrations and whether they are identified?	Yes
405.	Whether any vibration study has been carried out?	Yes
406.	Are the measures taken to combat vibration to acceptable levels?	Yes
407.	What is the frequency for measurements of vibration?	Monthly
408.	Are the records of measurements and maintenance of equipment/ system maintained?	Yes
HEAT STRESS/ COLD STRESS		
409.	Are there sources from equipment increasing the heat load in work places?	Yes Steam line.
410.	Whether evaluation of heat stress is carried out?	NA
411.	Whether natural ventilation is adequate to minimize the heat stress in work environment?	Natural ventilation is adequate.
412.	Are resources available to deal with very hot or very cold conditions	Yes

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
	(drinking water, lined gloves, insulated boots)?	
413.	Do workers know the symptoms of heat cramps/ heatstroke or frost bite/ hypothermia?	Yes
414.	Are the personal protective equipment suitable for reducing the effects of heat stress available?	Yes
NON-IONIZING RADIATION		
415.	Does the work involve likely exposure to non-ionising radiations (ultraviolet, infrared, radiofrequency, microwaves, lasers, etc.)	Yes Welding & Gas cutting operations.
416.	Whether risk assessment has been done for all work areas involving presence of non-ionising radiations?	Yes
417.	Are the work areas displayed with relevant safety signs?	Yes
418.	Are the employees aware about the hazards of non-ionising radiations?	Yes
419.	Does a written procedure exist for working in non-ionising radiations?	Yes
420.	Is the work environment monitored periodically for physical hazards and control measures initiated whenever deviation from permissible values is observed?	Yes

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
421.	Whether suitable personal protective equipment's are provided to workers exposed to non-ionizing radiations?	Yes
WORK PLACE MONITORING FOR HAZARDOUS CHEMICALS		
422.	Whether the dust, fumes, smoke aerosols and mist are monitored as per statute and records maintained?	Yes Form No. 37 is maintained.
423.	What are the types of detectors used for monitoring concentration of hazardous chemicals?	Smoke detectors, Chlorine detectors, Hydrogen detectors etc. are installed.
424.	Is any alarm system installed for any leakage of hazardous chemicals?	Alarm system installed for leakage of Chlorine & Hydrogen.
425.	Are antidotes available for toxic chemicals?	Yes
426.	Are control measures initiated whenever deviation from permissible values is observed?	Yes
FIRST AID FACILITIES AND OCCUPATIONAL HEALTH CENTRE (OHC)		
427.	Are adequate numbers of first aid boxes provided? Give location details?	Yes
428.	Are qualified/ trained first aiders available in each shift?	Yes
429.	How many qualified/ trained first-aiders are available at each plant/ department?	Adequate Nos. of qualified/ trained first-aiders are available at each plant/ department.
430.	How many persons are trained/ given refreshers training in first aid in a year?	As per requirement.

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
431.	Whether Occupational Health Centre is provided?	Yes Full fledge OHC available.
432.	Does OHC conform to the provisions of the existing statutes?	OHC is built as per requirement of GFR.
433.	Are the Medical Attendants/ Doctors available in each shift?	Yes
434.	What facilities are available for transportation of the injured to hospital?	2 ambulance with driver and tie up with Hospitals at Dahej and Bharuch.
435.	Are the names of the trained first aiders displayed?	Yes Name of ERT members are circulated to all employees in each shift.
436.	Are the name of nearest hospitals and its telephone number available in OHC?	Yes
437.	Does the plant have any special preventive medicine program?	Yes
438.	Is ambulance posted in proper place and is it available whenever required?	Yes
439.	Are sufficient numbers of anti-dotes available in case of any emergency?	Yes
440.	Are fire safety measures provided in first aid centre?	Yes
441.	Are emergency lighting arrangements available at first aid centre?	Yes
PERIODIC MEDICAL EXAMINATION		

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
442.	Whether the periodical medical examination of employees, required under relevant statute is carried out?	Yes Form No. 32 For company employee and contractor worker maintained.
443.	Whether it is ensured that contractors employee are medically examined during pre-employment as well as during the course of employment?	Yes Form No. 33 for pre-employment is maintained and periodic medical check-up is also carried out.
444.	During the periodical medical examination of the workers, are they examined as per the hazardous process in which they work? (First schedule of *The Factories Act,* 1948)	Yes
445.	Are the records of all such examination maintained?	Yes, Available & Maintained.
PERSONAL PROTECTIVE EQUIPMENT AND EMERGENCY EQUIPMENT		
446.	Whether list of required PPE for each hazardous activity is available?	Yes
447.	Whether feedback from workers obtained during selection of PPE?	Yes
448.	Have the workers been trained in proper use of PPE including BA sets?	Yes BA sets training is given & records are maintained.
449.	What is the system of procurement, inspection, issue, maintenance and replacement of PPE?	PPE procurement, inspection, issue, maintenance system is available.

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
450.	Whether qualitative and quantitative fit-check for respirators is ensured prior to use?	Yes
451.	What are the arrangements for safe custody and storage of PPE?	Locker provided, PPE's box provided at each plant area.
452.	Are the contractor's workers provided with the required PPE?	Yes
453.	Do the PPE conform to any standard?	IS Standard.
454.	Are sufficient eye wash fountains and safety showers available?	Yes 58 Nos. of Safety Shower with Eye Washer available.
455.	Whether appropriate respiratory protective devices are available in accordance to the hazard potential?	Yes
456.	Are the staff members trained in the right uses of respiratory protective devices?	Yes
OCCUPATIONAL DISEASES		
457.	Whether pre-employment medical check-up data available?	Yes Form No. 33 is maintained.
458.	During the medical check-up, is any person found having occupational diseases mentioned in 3rd schedule of *The Factories Act*, 1948?	No
459.	Whether the medical practitioner informed the Chief Inspector of	No such disease found till date.

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
	Factories about the occurrence of the occupational disease?	
ACCIDENT / INCIDENT REPORTING, INVESTIGATION AND ANALYSIS		
ACCIDENT REPORTING AND DATABASE MANAGEMENT		
460.	What is the procedure for accident/ incident/ dangerous occurrence reporting?	Online "Suraksha Setu" portal has been used to reporting any kind of incident/accident, near miss, safety observation.
461.	Whether the accident data for the last *five* years for reportable and non-reportable accidents are available?	Accident data available at Safety and HR Department.
ACCIDENT INVESTIGATION		
462.	Are all the accidents investigated?	Yes
463.	Whether accident investigation procedure is documented?	Yes Accident data available at Safety and HR department.
464.	Whether accident investigation reports are submitted to top management?	Yes
465.	How are the findings from accident investigation reports communicated to workers?	Through mail & training and discussed in safety committee.
ANALYSIS OF ACCIDENTS		
466.	Whether accident analysis is done as per IS 3786?	Yes
467.	Whether root causes of accidents are analysed?	Yes

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
468.	Is the accident statistics effectively utilized? If yes, how?	The data is apprised to avoid reoccurrence, for preventive action and to identified the training needs.
469.	What nature of injuries occurred during the last five years?	Soft tissue injuries, Sprain Injuries and Slip-Trip types of injuries.
IMPLEMENTATION OF RECOMMENDATIONS		
470.	How does the management ensure implementation of the recommendations to avoid recurrence of accidents and incidents?	By discussion, inspection, different types of safety reports, safety Audit and CAPA.
REPORTING AND INVESTIGATION OF NEAR-MISS INCIDENTS		
471.	Are all near-miss incidents reported and investigated?	Yes
472.	Is there any system of classifying and analyzing the near-miss incidents?	Yes
EMERGENCY PREPAREDNESS		
SITE SPECIFIC DETAILS		
473.	Are the site area maps (including layout, access roads and assembly points) available in control room / emergency control centre?	Yes
DUTIES AND RESPONSIBILITIES OF KEY PERSONNEL		
474.	Is the hierarchy of emergency response personnel right from site emergency controller downward?	Yes Organogram Available.

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
475.	Are the duties and responsibilities assigned to the designated officials during emergency?	Yes Covered in OSEP.
IDENTIFICATION OF EMERGENCIES AND ACCIDENT SCENARIO		
476.	Are the possible accident scenarios leading to emergency identified and known to the operating personnel?	Yes Accident Scenarios are covered in On-Site Emergency Plan.
477.	Are approved emergency preparedness plans (on-site and off-site) in place?	Yes
DECLARATION AND TERMINATION OF EMERGENCY		
478.	Is the list of designated officials who are to be communicated about declaration and termination of emergency available in the control room / emergency control centre?	Yes Covered in OSEP.
479.	Are the methods of communication (siren, public address system etc.) for declaration and termination of an emergency known to all the workers?	Yes Covered in OSEP.
RESOURCES-EVACUATION / TRANSPORT		
480.	Are the following resources (equipment, personnel and procedures) required to handle emergency available? **1.** Communications, **2.** Public announcement systems **3.** Monitoring of hazardous releases into the environment,	 **1.** Communication through Landline, Walkie Talkie & Mobile Phones. **2.** Available.

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
	4. Emergency shelters at the facility, **5.** Emergency exits with proper illumination, with uninterrupted power supply, **6.** Direction for emergency exit/ escape route marked in haulage/ Alleyways, **7.** Transport for evacuation of plant personnel **8.** Medical care including administration of antidotes, **9.** Security / maintenance of law and order.	**3.** Portable multiple gas detector is available. **4.** Assembly Points are assigned. **5.** Available. **6.** Available. **7.** Available. **8.** Available. **9.** Available.
COMMUNICATION FACILITIES		
481.	Does the emergency control centre have direct communication links with the fire station and the plant control room?	Yes
482.	Are there adequate alarm points from which an emergency alarm can be raised?	Yes
483.	Is there infrastructure available for ensuring backup electric power supply for communication links where required?	Yes UPS system available, DG set available.
MEDICAL CARE		
484.	Is the procedure for emergency medical care available?	Yes Emergency Medical procedure available.

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
485.	Whether the system has been tested at regular frequency through mock drill/ exercises for its adequacy?	Yes Mock Drills are conducted montly. Records are maintained.
486.	Does the system of periodic replacement of antidotes and medicines required in emergency exist?	Yes Replacement done as per expiry dates.
UPDATION OF EMERGENCY PLAN		
487.	Is the emergency plan updated based on the feedback from the periodic drills/ exercises?	Yes
488.	Are the contact details of all concerned officials kept updated in the emergency plan?	Yes
PERIODIC DRILLS/ EXERCISES		
489.	Are mock-exercises conducted at stipulated intervals?	Yes Mock Drills are conducted Monthly.
490.	Are the scenarios varied in the mock-exercises to ensure that all possible factors including meteorological conditions, affected plant personnel covered?	Yes
491.	Whether emergency preparedness Plans have been tested and reviewed at regular frequency through mock drill for its adequacy?	Yes
TRAINING OF PLANT PERSONNEL		

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
492.	Are the plant personnel trained in handling emergency equipment?	Yes Training is given on regular basis.
PUBLIC AWARENESS PROGRAMMES		
493.	Are public awareness programs conducted for the people around the site regarding the actions to be taken in case of off-site emergency?	Yes
MUTUAL-AID PROGRAMME		
494.	Are the types of accidents where external organizations would be involved in remedial actions identified? Are their responsibilities defined?	Yes Responsibilities have been defined in Onsite Emergency Plan.
495.	Is the plant responsible for rendering mutual aid assistance to any other external organizations? Does this assistance affect the plant's emergency preparedness?	Yes It doesn't affect the plant's emergency preparedness.
496.	Whether the communication channels for mutual assistance identified and known with and between two organizations?	Yes Communication channels for mutual assistance identified and known with and between two organizations.
EMERGENCY CONTROL CENTRE		
497.	Is the Emergency Control Centre located beyond the effective distances of identified emergency scenarios?	Yes ECC located near to Gate beyond the effective distances of any identified emergency scenarios.

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
498.	If the emergency control centre is located within the effect distance, is it suitably protected that it will be available in case of emergency?	No
SAFETY INSPECTION		
INSPECTION PROGRAMME		
499.	Are checklists available for inspections? For example, availability of checklists like: **a.** Handling, Storage and Transportation of hazardous chemicals. **b.** Electrical hazards; **c.** Fire safety; **d.** Hand and portable power tools; **e.** Machine hazards; **f.** Lifting equipment; **g.** Ladders and scaffolding; **h.** Environmental Monitoring; **j.** Civil structure; **k.** Housekeeping; **m.** Emergency equipment; and **n.** Gas cylinder and other pressure vessels used / available in the organization.	Yes Checklist for different task has been prepared & maintained by the Department. Also followed as and when the task is performed.
SAFETY RELATED DEFICIENCY (SRD) REPORT		
500.	Are SRDs generated based on the area wise checklists?	Yes

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
		Process related and plant related deviation reported.
501.	What is the procedure for resolving the SRDs?	Sheet maintained/ checklist available. (standard format is available)
502.	Whether the procedure exists for notification and root cause analysis of non-conformities and action taken on them?	Yes
SAFETY INSPECTION RECORDS		
503.	Are the safety inspection records maintained?	Yes
METHODOLOGY AND INSPECTION TEAM		
504.	Is there written procedure for safety inspection?	Yes
505.	Whether safety inspection is carried out by a designated team?	Yes EHS department team done these jobs with help of concerned department HOD.
506.	What is the frequency of safety inspections?	Monthly.
507.	Whether an inspection report is generated?	Yes. Records are maintained.
COMPLIANCE OF RECOMMENDATIONS		
508.	To whom the recommendations are submitted?	To concern area In-charge.
509.	Are recommendations of safety inspections complied in time?	Yes Complied on time and Records are available.

NO.	ITEMS	OBSERVATIONS & RECOMMENDATION
510.	Is compliance of recommendations sent to top management?	Yes
511.	Is compliance of recommendations reviewed by safety committee?	Yes
512.	Does top management follows-up the compliance?	Yes

5.0 CLOSING MEETING

After preparing the Observations and Recommendations as mentioned in previous chapter, closing meeting was held and observations were discussed and agreed upon by Plant Management team. Each point was discussed, some missing information was obtained and the recommendations were finalized. The intention of the recommendations and their mode of compliance were explained to the plant management.

6.0 RECOMMENDATION RATIFICATION METHODOLOGY

After finalizing the Audit Observations and Recommendations in the closing meeting as mentioned in the previous chapter, the audit report is prepared by the Lead Auditor and it is ensured that the report is containing all the items required by IS 14489: 2018.

The Recommendations are given in Chapter 3.8 and along with Annexure B & C in Chapter – 4 and executive summary has been prepared for immediate review by the top management.

HSE department and the concern plant management are requested to convert these recommendations into

Action-oriented activities for implementation. The action plan should reflect responsible person and its pragmatic target dates. The action plan should be reviewed in respective plant performance meeting every month. If needed, we may be contacted for "**Compliance or Follow-up Audit**" to review implementation of recommendations of this audit.

7.0 CONCLUDING REMARKS

M/s. Prosafe Process Engineering Pvt. Ltd. - Surat Audit team had a privilege to enjoy the hospitality and cordial warm welcome by each and every plant.

Our experienced audit team strongly believes that the prevailing enthusiasm should be kept on track by developing system approached procedures. It is an industry wide experience that enthusiastic movement dies over a period of time, if corrective actions are not taken to cast these initiatives into procedural frame.

Now, it is a right time to take next Delta improvement by developing a framework encompassing people accountabilities, linkage with performance management and imbibing operating discipline.

Above said improvement avenues will yield excellent result if it is harnessed with safety culture. In view of the HSE commitment of top management, building a safety culture will take a minimal time if it is administered through behavior-based safety approach. M/s. PROSAFE has a capability to design customized HSE architect to achieve zero incident work place.

Once again, we are thankful to M/s. Gujarat Fluorochemicals Ltd. – Dahej for giving opportunity to become your business partner. We shall be happy to retain our relationship.

"Every Accident is a notice that something is wrong with Men, Methods, or Material – Investigate – then Act."

II END OF THE REPORT II

GUJARAT FLUOROCHEMICALS LIMITED

Doc. No.: OERP/GFL/DAHEJ

GUJARAT FLUOROCHEMICALS LIMITED
12/A, GIDC DAHEJ INDUSTRIAL ESTATE, TALUKA - VAGRA,
DIST. BHARUCH-392130, GUJARAT



ON-SITE EMERGENCY RESPONSE PLAN

April-2023
Date of Rev.: 30.05.2023
Rev. No.:13

GUJARAT FLUOROCHEMICALS LIMITED

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GUJARAT FLUOROCHEMICALS LIMITED

PREFACE

In order to accomplish the requirement of ISO-EMS 14001:2015 & ISO-OHSMS 45001:2018, Section 41B of Factories Act 1948, Rule-68J (12) of Gujarat Factories Rule 1963, MSIHC Rule 1989 (framed under EPA1986) and Rule-21(k) &Rule-33 of Atomic Energy (Radiation Protection) Rule-2004 Under Atomic Energy Act–1962, this plan has prepared in accordance with guidelines given in these safety legislations. Full attention is paid to the guidelines of National and Gujarat State Disaster Management Authorities and Directorate Industrial Safety and Health, Govt. of Gujarat while preparing this plan.

The first part of this plan contains the details about the emergency action plan and the second part contains the list of the Annexures and references.

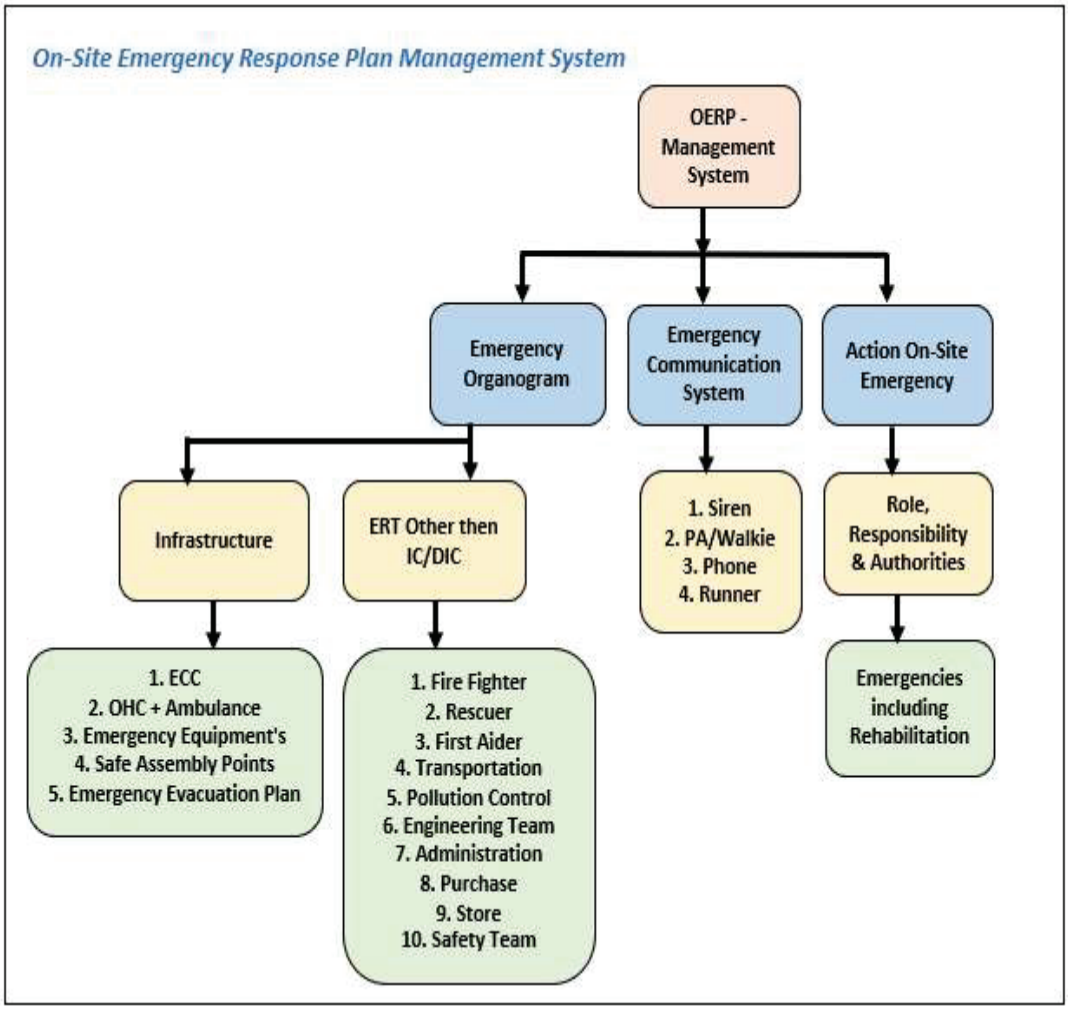
This Emergency Action Plan would be made known to the workers, the public in vicinity, the interested parties and the interested government authorities.

We assure you the plan would lead to better execution and rapid control of any emergency within plant premises and it will also help govt. authorities in planning for mutual aid for Off-Site Emergency Action Plan.

Dahej, Bharuch

GUJARAT FLUOROCHEMICALS LIMITED

On-Site Emergency Response Plan Overview



Were,

ECC	:	Emergency Control Centre
IC	:	Incident Controller
DIC	:	Deputy Incident Controller
ERT	:	Emergency Response Team
AP	:	Public Announcement

GUJARAT FLUOROCHEMICALS LIMITED

PRELIMINARY

1. INTRODUCTION:

The plan is in two sections. The first section explains basic requirements, definitions, objectives, hazard identification, risk analysis and environmental impact assessment, organizational set up, communication system, actions on site, link with off-site emergency plan and the aspect of training, rehearsal and records. The second section is given as 'Annexure Section' containing 33 useful annexures. These annexures are designed to fulfill requirements of specific information inferred from the first section. Ready information in all these annexures will considerably save the time in initiating all actions at the time of emergency.

2. IDENTIFICATION OF THEFACTORY:

This gives basic information about the factory including safe assembly points, emergency exits, location of fire extinguishers, location of alarms and sirens etc. Annexure – 3 is attached for this.

3. MAP OF THEAREA:

Annexure – 2 and 3 given as a map of the area showing the factory location, residential areas, surroundings, approaches to the factory, main gate, other gates, access to outside emergency facilities such as fire station, police stations, hospitals, nursing homes, railway station, bus station, other transport centers, shelters, mutual aid centers, petrol pumps, schools, telephone office, and offices of the Home guards, civil defense, voluntary organizations, experts in the field of safety, health, hygiene, toxicology, environmental protection etc.

An accident is an unplanned event, which has a probability of causing personal injury or property damage or both. It may result in physical harm (injury or disease) to person(s), damage to property or environment, loss to the company, an emissary any combination of the effects or the delayed effect.

A major accident is a sudden, unexpected, unplanned event, resulting from uncontrolled developments during an industrial activity, which causes, or has the potential to cause –:

1. Serious adverse effects immediate or delayed (death, injury, poisoning or hospitalization) to a few people inside the installation and/or to persons outside the establishment, or Significant damage to crops, plants, or animals, or significant contamination of land, water or air.
2. An emergency intervention outside the establishment (ex. evacuation of local population, stopping of local traffic) or,
3. Significant changes in the process operating conditions, such as stoppage or suspension of normal work in the concerned plant for a significant period, or
4. Any combination of above effects.

An emergency could be defined as any situation which presents a threat to safety of person or/and property. It may require outside help also.

A major emergency occurring at a work is one that may affect several departments within it and/or may cause serious injuries, loss of life, extensive damage to property or serious disruption outside the work. It will require the use of outside resources to handle it effectively.

Disaster is a catastrophic situation in which the day-to-day patterns of life are, in many instances, suddenly disrupted and people are plunged into helplessness and suffering and as a result need protection, clothing, shelter, medical and social care and other necessities of life, such as –:

1. Disasters resulting from natural phenomena like earthquakes volcanic eruptions, storm, surges, cyclones, tropical storms, floods, landslides, forest fires and massive insect infestation. Also in this group, violent drought, which will cause a creeping disaster leading to famine, disease and death must be included.
2. Second group includes man-made disasters i.e., disastrous events occasioned by man, or by man's impact upon the environment, such as armed conflict, industrial accidents, factory fires, explosions and escape of toxic gases or chemical substances, river pollution, mining or other structural collapses; air, sea, rail and road transport accidents, aircraft crashes, collisions of vehicles carrying inflammable liquids, oil spills at sea, and dam failures.

Hazard is a physical situation (existing unsafe condition or action), which may cause human injury, damage to property or the environment or some combination of these criteria.

Risk is the likelihood of an undesired event (i.e., accident, injury, or death) occurring within a specified period or under specified circumstances. It may be either frequency or probability depending on the circumstances. Societal risk is a measure of the chances of many people being affected by a single event or set of events and is often presented as f/n curves (i.e., frequency v/snumber of people affected).

The on-site emergency plan deals with measures to prevent and control emergencies within the factory premises and not affect outside public or environment. Mostly the emergency is controlled d by the infrastructure of the plant, i.e., people, equipment, vehicles etc. belonging to the plant itself.

4. WHY THE EMERGENCY RESPONSE PLAN:

- ➢ To work out a plan with all provisions to handle emergencies.
- ➢ To define and assess all likelihood of emergencies.
- ➢ To control/contain incidents and their effects within the shortest possible time.
- ➢ To safeguard employees and people in vicinity
- ➢ To minimize damage to property and environment.
- ➢ To define role &responsibilities of the employees during emergency
- ➢ To be ready for 'mutual aid 'if need arises to help neighboring unit.
- ➢ To inform authorities and mutual aid centers to come for help.
- ➢ To be prepared for effective rescue and treatment of casualties.
- ➢ To secure the safe rehabilitation of affected areas and to restore normalcy.
- ➢ To ensure safety of the works before personnel re-enter and resume work.

GUJARAT FLUOROCHEMICALS LIMITED

Chapter-1
Introduction

1. Objective:

- The object of the plan is to lay down steps to handle emergency situation that may arise due to leakage/spillage, explosion and fire of the various chemicals, fuels in the plant, which may have any adverse effect on employees and public at large is to minimize and normalcy is restored within shortest possible time.
- This On-site Emergency Response Management Plan is prepared to meet such grave emergency which can occur due to major fire in the plant missile hit due to air raid, heavy leakage of flammable liquid or gas explosion (internal or external cause) leakage of toxic gas in any plant.
- On-site Emergency Response Management Plan (action plan) has been drawn to fix responsibility & actions to be taken by various groups to meet & contain the emergency within shortest possible time & with minimum loss to men, materials, machines &property.
- It is the responsibility of all individuals in their respective areas to ensure success of this plan. This plan shall be circulated for benefit/training of all individuals working in **Gujarat Fluorochemicals Limited.**

The major functions & objectives to formulate the plan are: -

I. To mobilize the available/trained manpower and handle the emergency from:
   - On-site (with in factory)
   - Off-site (through outside factory)

II. To ascertain urgently likely area of influence and take actions for warnings, control of emergency with minimum damage to men, material, machines, and evacuation of employees/public, identify the persons affected/dead, arrange first aid/medical help to the victims.

III. Inform relatives of the casualties, provide authoritative information to News Media & others and preserve relevant records & Equipments needed as evidence in any subsequent inquiry.

IV. Appraise District Administration/Civil authority's etc. in order to ensure prompt relief for execution of Emergency Response Management Plan.

This document sets out the On-site Emergency Response Management Plan for all levels of accident ranging from a local incident within the site boundary to a situation that requires outside support. The objectives of the emergency response management plan are:

- To protect lives of working personnel and nearby population.
- To contain the hazards and to control its spread.
- To minimize the impact on the environment.
- To minimize the loss to plant and production.

2. Definition & Scope-

- Emergency:

An emergency is any inadvertent incident, which causes or may cause personnel injuries and equipment damage such as fire, explosion, and loss of containment of hazardous material and flammable or toxic gas release.

- Accident:

An accident is an unplanned event which has a probability of causing personal injury or property damage or both. It may result in physical harm in the shape of injury or decease to people, damage to property, loss to the company, a near miss or any combination of these effects.

- Disaster:

A disaster is an emergency, which causes or may cause multiple personnel injuries or extensive property damage or impact the surrounding community, which requires external emergency responses. This incident would interrupt normal operations or conduct of business and has the potential to quickly focus extensive news media coverage and public attention on the site /company.

The On-site Emergency Response Management Plan:

The on-site emergency response management plan measures the potential hazards may be due to following: -

- Leakage or Release of Toxic Gas.
- Fire or explosion in the plant or storage area.

The On-site Emergency Response Management Plan has been prepared in order to provide proper guidance to plant operating personnel to confidently handle any accidental leakage/spillage of the toxic material or fire/explosion/bursting of vessel or any natural calamity or sabotage.

With this objective comprehensive information has been assembled in the following paragraphs on Hydrogen, Chlorine, Carbon Tetra Chloride, Methanol, Hydrochloric Acid, Sulphuric Acid, R-22, TFE Reaction, PTFE Reaction, Electrolysis, etc. and about its properties, fire hazards, safety appliances, safety measures incorporated in the plant, emergency procedures and finally regarding the constitution & responsibility of Emergency Rescue Team (Emergency Response & Management Team/Task Force).

3. Methodology-

- A major emergency occurring at a plant is one that may cause serious injuries, loss of life, extensive damage to property or environment or serious disruption inside or outside the plants. This may demand the rescue and relief measures on a war footing to handle it effectively and quickly. Within the high-risk technology industries, the need for well-planned measures should be self-evident.

- No matter how well a process is controlled and safeguarded by instruments and process safety procedures, it is inevitable that there is a residual risk, which is capable of causing a variety of emergencies.

- The Factories Act, 1948 as amended in the year 1987 under section 41B (4) requires that every occupier shall draw up an

On-site Emergency Response Management Plan and detailed emergency control measures for his plant and make them know to the employees and to the general public living in the vicinity of the plant. According to GFR (Oct'94) Schedule 11 [under Rule 13 (1)] it is statutory for the industries to submit On-site Emergency Response Management Plan with relevant details.

- Its objective is to reduce the severity of loss following hazardous incidents. At the same time, it must be clearly understood that it is not a substitute for maintaining good standards for working consistently with the requirements of safety and health inside the plants. On-site and Off-site Emergency Response Management Plans are to be separately prepared, but they must be consistent with each other.

4. Introduction-

- The On-site Emergency Response Management Plan describes the Organization & procedures for dealing with potential accidents arising from the operations of **GUJARAT FLUOROCHEMICALS LIMITED**, Dahej. Experience of accidents that have occurred in various other chemicals manufacturing plants was considered in the preparation of this Plan especially storing & handling the hazardous chemicals identical to this plant. This plan will need periodic review & modification following emergency exercises or include any new information relating to changes to the facilities.

- The workforce inside the plant is exposed to various systems, pipelines & vessels and process Equipments which, if not properly operated & maintained, could cause serious accidents affecting life & properties in the vicinity of accident site. In addition to these, the inventory & transportation of the chemicals may create chances of accidents.

This Plan is needed to respond to a variety of emergencies/disasters:

I) Disasters due to emergency on account of:

- Fire
- Bursting or Explosion
- Oil spillage
- Spillage or leakage flammable liquid/gas
- Release of toxic gas

ii) Disaster due to natural calamities such as:

- Flood
- Earthquake
- Storm/cyclone
- Cloud burst/lightening Disaster due to external factors such as: Food poisoning
- Sabotage
- Civil Riots or War

- The action plan responding to an emergency situation depends very much on the level of the emergency, which itself is defined by the consequences arising from the types of hazards identified. The organization & duties of the Emergency Team & the action plans for each of the disaster levels is included in this document.

- The plant is provided with various safety & emergency control facilities to prevent & control any disastrous occurrences.

Measures for preventing & controlling emergencies are outlined in following sections. It also includes information on the plant facilities & their location.

The Scenario

A small Helicopter OR aircraft crashes on the industrial area GFL could result in very large number of casualties and considerable disruption to both surface and possibly air traffic and to essential services. There would also be a considerable risk of fire caused by escaping fuel. The consequences of the crash and the measures needed to deal with it would vary according to the circumstances. This Contingency Plan summarizes the emergency response of the Government and other organizations in dealing with the worst conceivable case of an aircraft crash in the industrial area urban area.

Out of all the plant emergencies, we consider chlorine, Hydrogen leakage and hydrocarbon fire as MAJOR EMERGENCY and the details of the same are described in Offsite emergency plan (LCG, DCG).

Emergencies are defined according to type on the basis of the materials and activities involved. The type of emergency will determine the potential impact of the incident on people, property, and the environment. These issues should be addressed in the process of defining the hazards. Examples of types of emergencies are:

Fire (including the generation of toxic combustion products)

Explosion (including BLEVE)

Spill (of hazardous solids and/or liquids)

Gas leak (flammable, toxic, asphyxiant, pressurized or refrigerated liquid)

Structural failure.

Natural events (including flood, earthquake, storms, storm tides, etc.)

Impact event (road vehicles, railways, aircraft, ships)

Subversive activities (bomb threat, sabotage, etc.)

Transport (Aircraft) incident.

These types of emergencies should be considered for:

an incident within the facility

An incident occurs outside the facility where hazardous material is the responsibility of the facility (e.g. off- site pipeline, transport, etc.)

Secondary events or knock-on effects arising within or outside the facility (for example, a flood, earth quack or an explosion which causes a helicopter or a small aircraft crash).

GUJARAT FLUOROCHEMICALS LIMITED

OFF SITE - Emergency Monitoring & Support Centre (EMSC)

ALERTING SYSTEM

1- In the event of a helicopter OR aircraft crash, the Duty Air Traffic Controller of Civil Aviation Department (CAD) will initiate the alerting system according to the offsite emergency plan and communication.

LOCAL (L-1)	**ON-SITE (L-2)**	**OFF-SITE (L-3)**
An emergency where the impacts on people, property and the environment: are expected to be confined to a specific location within the facility and no escalation is expected	An emergency where the impacts on people, property and the environment: are expected to spread to or affect all parts of the facility, but not off- site	An emergency where the impacts on people, property and the environment: are expected to impact both within the facility and beyond the boundary of the facility
Emergency Services **MAY BE REQUIRED**	Emergency Services **SHOULD BE REQUIRED**	Emergency Services **WILL BEREQUIRED**
Examples: ruptured drum in warehouse leaking flange or seal small fire in a plant	Examples: tank or bund fire pipe rupture, RD Failure	Examples: a bomb threat large tank bund fire BLEVE of large liquefied gas storage toxic gas release small air crash incident

GUJARAT FLUOROCHEMICALS LIMITED

Chapter-2

Risk & Environmental Impact Assessment

Introduction of Risk and Environmental Impact Assessment Plan

- Identification, analysis and assessment of hazards and risk provide vital information to Risk Management.
- Based on available data hazard identification for the factory has been done, in a chemical industry four main hazards i.e., fire, explosion, release of toxic chemicals and corrosion
- Theidentificationandpreventionofthesehazardshavebeendealtinthischapter.

Risk Assessment:

- In the hazard identification section, the potential hazards were identified. It was also studied the inbuilt design safety features in the plant layout & in process operation various infrastructure facilities are provided to protect against each hazard.
- In the risk analysis, consequential effects to the onsite & off-site areas are considered. The consequential effects are though based on following various calculations, considering maximum quantitative risk involved in the installations.

- Release rate calculation
- Fire explosion calculation
- Gas dispersion calculation. Following are major as Sumption made to calculate consequential effect.
- The weather condition &data are considered normally prevailing in Dahej area.
- The physical properties of chemicals (Flashpoint, boiling point, specific heat, etc. from standard book.
- The maximum quantity likely to be stored or handled in the vessel is considered.

Type & Consequences of Major Hazard

- A major hazard is generally associated with the potential for dispersion of toxic chemicals, fire and release of material from the containment.
- Release of toxic material, formation of toxic gas cloud &drifting of gas cloud toward down-wind direction affecting directly the site &possibly populated areas.
- Release of flammable material, mixing of the material with air formation of flammable vapor cloud & drifting of the cloud to as our self of ignition, leading to a fire or explosion.
- Dispersion of pollutants of small particles in the atmosphere is a function of the stability of the air, the wind speed & the atmosphere turbulence.
- A possible on-site emergency has been identified for all the plants with its associated risk. Moreover, safety audit and safety inspection are being carried out at regular interval.
- Based on the raw materials stored, manufacturing process, plant and machineries and various process parameters, following are the various risks involved:

(1) Risk of toxic chemical spillage/Leakage.
(2) Risk of fire

(3) Risk of physical injuries to the person working in the plant.

(4) Gas leak (Toxic and Flammable)

(5) Workplace Violence

(6) Biological Hazard

(7) Sever Weather condition.

Identification of Scenario:

Vapor Cloud Dispersion (Flammable / Toxic)

Following a continuous leak and formation of gas cloud, if cloud does not ignite, it undergoes atmospheric dispersion in accordance with the prevalent wind direction, speed and stability category (namely, degree of turbulence).

Atmospheric stability is an important criterion for dispersion, which depends on the difference between surface and air temperatures. It is a measure of the atmospheric turbulence caused by thermal gradients. There are six categories denoted by the letters A to F. Weather in category 'A' is most turbulent, 'D' is neutral and that in 'F' category is least turbulent.

A	B	C	D	E	F
Very unstable	Unstable	Moderately unstable	Neutral	Moderately stable	Stable

Neutral conditions correspond to a vertical temperature gradient of about 1°C per 100 m.

The cloud dispersion simulation is carried out for the following two objectives. First, it provides the distance (from the leak) at which the concentration of flammable material falls below the Lower Flammability Limit (LFL).

Secondly, it provides the concentration of the toxic substance to which people may be exposed, at varying distances (from the source of leak).

The vapor cloud, for which its density is higher than that of air, essentially, hugs the ground in the initial stages of dispersion. However, once the density of cloud reaches the density of air, it behaves as a buoyant plume.

Vapor Cloud Explosion

Explosion is a sudden and violent release of energy which may be in the form of physical energy or chemical energy. In case where a major leak continues for some time without ignition, a substantial mass of the gas / vapor forms a cloud. On finding a source of ignition, this may result in a **V**apor **C**loud **E**xplosion (**VCE**) before the cloud is diluted to the concentration below the lower explosion limit (LEL) in air. The explosion will cause overpressure resulting into damage to the surrounding area.

Pool Fire

Following an accidental release from storage tank bottom nozzle failure / piping failure / Pump discharge nozzle failure etc., chemicals will form either a confined pool within the bund area or an unconfined pool. Should the vapor above the pool ignite, the liquid will burn as a Pool Fire. The Pool Fire will result in thermal radiation. Impact distances for various levels of thermal radiation are calculated for different scenarios in the plant.

Jet Fire

After a minor or major loss of containment following hardware failure, chemicals which are stored under high pressure would escape as liquid / gas spray or jet which undergoes flashing evaporation and forms a dense flammable gas cloud in the air.

The cloud would initially move forward in the spatial direction of the spray till the kinetic energy is lost and gravity slumping of cloud occurs if the gas is heavier than the air. Should the flammable jet ignite very soon after development of the leak, a Jet Fire will commence.

The Jet Fire could damage the neighboring vessels / tanks by direct flame impingement. It would also cause thermal radiation in the surrounding area.

Risk Analysis for Gujarat Fluorochemicals Limited

For Gujarat Fluorochemicals Limited, Dahej, the main hazard in the facilities is toxic release of liquid chlorine and overpressure effect of Natural Gas pipeline. The other hazard can be the leak and fire at raw material tank farm area. The case of toxic release, Overpressure and thermal radiation effects are estimated using appropriate software. The simulation results indicate that the consequence distances extend beyond the battery limit and fall outside the facility boundary. The consequence distances for chlorine release are summarized in **Annexure –10 (Gas dispersion concentration)**. Evacuation distance for this scenario is identified based on maximum distance in case of Toxic release.

Risk of Toxic Chemicals Spillage / Leakage:

- The liquid Chlorine is stored in bullets, Methylene chloride in closed cylindrical vertical container, Carbon Tetrachloride, Sulphuric Acid, Hydrochloric acid, Chloroform, Caustic lye, Anhydrous Hydrofluoric Acid, Ethanolic KOH in Tanks.
- During unloading from road, tankers or while pumping from storage tank to process equipment, there is a risk of spillage / leakage of small quantity of liquid raw materials due to failure of valve, flange gaskets, weld joints or flexible hose connection.
- Leakage of Natural Gas & Chlorine from pipelines.
- Similarly, during manual handling of drums, there is a risk of spillage of chemicals if necessary, handling precautions are not taken. During charging into reactor / vessels or discharging from reactor, liquid chemicals leak due to failure of valve, hose connection or unsafe action of the person working. In order to overcome this risk following precautionary measures are taken:

All the storage tanks are provided with dyke walls and best quality valves.

1. Valves, piping, flanges, gaskets etc. are of standard quality and the system is tested with water circulation before using with chemicals.
2. P.P.E are provided & maintained & workers are instructed to use the same as & when required.
3. Periodic testing of reactors and storage tanks to ensure no leakage.
4. Proper supports to valves, piping
5. Neutralizing chemicals, dry sand etc. are made available to neutralize the spill &restrict spreading of liquid chemicals.
6. Chlorine gas leak detection system installed.

Risk of Fire & Explosion:

- Methanol, Methylene Chloride, Hydrogen & NG, Tetra Fluoro Ethylene, Ethanolic KOH, Vinylidene Fluoride is having flammable and explosion properties.
- Finely divided PTFE resins can become extremely combustible in the presence of various metal fines.

- Once polymerization starts, an exothermic chain reaction may occur that develops high temperatures and pressures within the reactor, and which can lead to possible explosion or violent rupture of the reactor and/or discharge of flammable and/or toxic gases.
- Riskoffirealsoexistsduetoelectricalshortcircuit&duetogascutting/weldingoperation.

In order to overcome above risk, we have provided following precautionary measures:

1. Portable fire extinguishers, water tapings and flexible hose pipes are kept at various places in the factory premises.
2. No smoking in factory premises. Hot work permit system is introduced. Unauthorized persons are not allowed to carry out gas cutting / welding operation or burn open flame.
3. No mobile zone declared at Flammable material storage area.
4. No loose electrical connections in the plant.
5. Proper earthling of all electrical apparatus.
6. Periodical maintenance and refilling of fire extinguishers.
7. Cable & switch gear are selected in such a way that they will not be over loaded.
8. Fire hydrant system network covers all the critical areas of plants with an installation of Hydrants, Fire Escape Hydrants, Water Monitors &sprinklers are provided.
9. Smoke, Flammable Gas /Toxic gas Detectors are provided.

Workplace Violence:

Prohibited Conduct

Gujarat Fluorochemicals Limited does not tolerate any type of workplace violence committed by or against employees. Employees are prohibited from making threats or engaging in violent activities. This list of behaviors provides examples of conduct that is prohibited:

- Causing physical injury to another person.
- Making threatening remarks.
- Displaying aggressive or hostile behavior that creates a reasonable fear of injury to another person or subjects another individual to emotional distress.
- Intentionally damaging employer property or property of another employee.
- Possessing a weapon while on company property or while on company business.
- Committing acts motivated by, or related to, sexual harassment or domestic violence.

Reporting Procedures

Any potentially dangerous situations must be immediately reported to a supervisor or the human resource (HR) department. Reports can be made anonymously, and all reported incidents will be investigated. Reports or incidents warranting confidentiality will be handled appropriately, and information will be disclosed to others only on a need-to-know basis. All parties involved in a situation will be counseled, and the results of investigations will be discussed with them. Gujarat Fluorochemicals Limited will actively intervene at any indication of a possibly hostile or violent situation.

Risk Reduction Measures

Hiring

The HR department takes reasonable measures to conduct background investigations to review candidates' backgrounds and to reduce the risk of hiring individuals with a history of violent behavior.

Safety

Gujarat Fluorochemicals Limited conducts annual inspections of the premises to evaluate and determine any vulnerabilities to workplace violence or hazards. Any necessary corrective action will be taken to reduce all risks.

Individual situations

Although Gujarat Fluorochemicals Limited does not expect employees to be skilled at identifying potentially dangerous persons, employees are expected to exercise good judgment and to inform the HR department if any employee exhibits behavior that could be a sign of a potentially dangerous situation. Such behavior includes:

- Discussing weapons or bringing them to the workplace.
- Displaying overt signs of extreme stress, resentment, hostility or anger.
- Making threatening remarks.
- Showing sudden or significant deterioration of performance.
- Displaying irrational or inappropriate behavior.

Employees at risk

The HR department will identify and maintain a list of employees who have been determined to be at risk for becoming victims of violence because of the nature of their job or because they are subject to harassment, violence or threats from a non-employee. HR and security will design a plan with at-risk employees to prepare for any possible emergency situations.

Dangerous/Emergency Situations

Employees who confront or encounter an armed or dangerous person should not attempt to challenge or disarm the individual. Employees should remain calm, make constant eye contact and talk to the individual. If a supervisor can be safely notified of the need for assistance without endangering the safety of the employee or others, such notice should be given. Otherwise, employees should cooperate and follow the instructions given. Report the incident to Security Officer on duty on telecom 8288/7359607700 or 8014.

Enforcement

Threats, threatening conduct, or any other acts of aggression or violence in the workplace will not be tolerated. Any employee determined to have committed such acts will be subject to disciplinary action, up to and including termination. Nonemployees engaged in violent acts on the employer's premises will be reported to the proper authorities and fully prosecuted.

Role of security in violent situation

The security officer receiving the call of workplace violence will note the following details: -

1. The exact place of incident.
2. Number of persons involved.
3. Weather they are in possession of nay arms or not.
4. Any type of injury to anyone.
5. Who all are involved (Company employees or contractual employees)

After noting down all the above-mentioned details the Security Officer will initiate the following actions: -

1. HR Head, Security Manager & ER Head shall be informed immediately along with the above-mentioned details.
2. Security Officer shall ensure no one leaves the premises through gates. Entry & exit shall be stopped immediately.
3. Security Officer shall move to the location of incident along with QRT team.
4. On reaching the location he shall immediately separate the persons involved in violence.
5. The Security Officer shall try to take possession of arms held by the involved parties after wearing hand gloves.
6. Security Officer shall call for ambulance if anyone is injured.
7. Security Officer shall note down the details of persons involved along with the reason of incident.
8. Security Officer shall escort the persons involved in violence to ER department. In case the incident occurs after General Shift then the Security Officer shall act on the guidelines of HR Head, Security Manager & ER Head

Biological Hazard:

What is biological hazard?

Biological hazards refer to organisms or organic matters produced by these organisms that are harmful to human health. These include parasites, viruses, bacteria, fungi and protein. In general, there are three majors of routes of entry for these micro-organisms into our body, i.e. through the respiratory system, transmission through contact with body fluids of the infected or contact with contaminated objects. The harmful effects posed to human health by these biological hazards are mainly of three types - infections, allergy and poisoning.

Occupations and workplaces where people may come into contact with biological hazards.

- Medical staff, cleaning staff and laboratory technicians in the medical profession.
- Healthcare services.
- Cleaning service s a n d property management.
- Employees in environmental hygiene services such as liquid waste and rubbish collection and disposal.
- Agriculture, fishery, veterinary services, and manufacturing g industries that use plant- or animal- based raw materials, such as paper and paper products, textile, leather and furs and related products; Indoor workplaces like entertainment premises, restaurants and hotels, where employees generally work in enclosed areas with central air-conditioning: –Any microorganism breeding inside the air-conditioning system or cooling towers may spread the workplace through the air-conditioning system. In the office building, the furnishing materials like carpets and wall- papers, the potted plants and places that are wet and damp or utensils that hold water are likely to be the breeding ground for microorganisms.

Preventive and control measures

Elimination of the source of contamination is fundamental to the prevention and control of biological hazards. Engineering controls such as improvement of ventilation, partial isolation of the contamination source, installation of negative pressure and separate ventilation and air- conditioning system (e.g. in medical wards for infectious diseases) and the use of ultraviolet lamps can help contain the spread of contaminants. If the contact with bbiological hazards can not be prevented, the employees must use personal protective equipment and adhere strictly to the practice of personal hygiene. The personal protective equipment includes masks, gloves, protective clothing, eye shields, face shields and shoe covers.

Respiratory protection

1. Using the appropriate respiratory protective equipment is important for securing adequate protection from biological hazards. Common protective equipment includes:

Surgical masks – Surgical masks generally consist of three layers of non-woven fabrics. It provides a barrier protection against large respiratory droplets N95 or higher-level respirators – This type of respirator filters out particulates and liquid droplets in small particle size, therefore providing protection from inhaling aerosols and microorganisms that are airborne.

The selection of particulate respirators should also consider whether the work environment contains oil mist or fumes and the required filtration efficiency necessary for the protection level. In general, where there are no oil mists or fumes as in a hospital setting, respirators of the N-series with filter efficiency of 95% (Type N-95), 99% (Type N-99) or 99.97% (Type N-100) are suitable. In an environment where there are significant amounts of oil mists, then the R-series, R95, R99 or R100 respirators

(where R stands for oil resistance), or the P- series, P95, P99 or P 100 respirators.

- **Powered Air Purifying Respirator, PAPR**. This type of respirator uses an electric blower to bring the air through the filter to the user making it more comfortable to wear.
- **Powered Air Purifying Respirator (PAPR)** Air - supplying respirators. Clean air is supplied by air compressor or high-pressure cylinder through a hose

The type of biological hazard, the nature of work and the work environment will determine the choice of respiratory protective equipment. Adequate training is required for using the PAPR and the air-supplying respirators to ensure their correct and safe use. It is also necessary to follow the manufacturer's recommendations in the use of these respirators. It is extremely important that the respirator should fit the wearer for a good face seal and the user must perform the seal check to ensure that the respirator is worn correctly for the required protection.

How to use disposable masks

Surgical mask offers a barrier protection from respiratory droplets. In the use of the masks, it is important to wear them correctly. When the mask is damp, damaged or soiled, replace it. A surgical mask in general can be used for several hours. If the surface of the mask is touched or the wearer has coughs, the mask needs to be changed more often. After use, the mask should be put in a bag or wrapped with paper before disposal. Wash the hands thoroughly afterwards

Points to note about wearing a surgical mask:

- The mask fits snugly over the face;
- The colored side of the mask faces outwards, with the metallic strip upper most;
- The strings or elastic bands are positioned properly to keep the mask firmly in place;
- The mask covers the nose, mouth and chin.
- Press the metallic strip on both sides of the bridge of the nose to keep the mask snugly over the face;
- Try not to touch the mask once it is worn over the face. If it is necessary to handle the mask, hands must be washed before and after touching the mask.
- Under normal circumstances, a surgical mask should be changed daily. Replace the mask immediately if
- it is damaged or Soiled

Points to note about wearing a N95 mask:

N95 masks are for use in high-risk medical departments such as casualty department, intensive care units, radiology departments (Chest X-Ray examination units) and physiotherapy departments (chest physiotherapy treatment units). Medical personnel that have to take care of high- risk patients or handle high-risk treatment procedures may choose N95 or higher protection level respirators.

- If required to wear N-95 mask, the face-piece must be of proper fit. Compare the size of different brands to find a suitable one.
- Follow the instructions of the manufacturer in wearing the mask;
- To reuse a N95 mask, it should be kept in a paper bag properly before using it again.
- If the N95 mask is soiled or damaged, replace it immediately.
- N95 mask should never be shared with anybody or brought outside the hospital.

N.B: Improper use of the mask may cause discomfort or reduce its level of protection.

N95 masks should not be used by persons:

- suffering from respiratory diseases, such as asthma and emphysema
- having difficulty in breathing or feeling dizzy after wearing it

Protective clothing

- Protective clothing includes protective coverall (with attached hood), gown, apron, head and shoe covers.
- Protective clothing should be waterproof or impervious to liquids to protect the body from contamination by blood, droplets or other body fluids and prevent the decontaminants from getting into the body through. open wounds or contaminating the worker's own clothing, thus reducing the chance of spreading of pathogen and cross-infection.
- Protective clothing is disposable in most cases though some can be reused after sterilization;
- Standard protective clothing should be chosen (for example, EU EN 340);
- Protective clothing should fit the wearer and should not hamper movement;
- Protective clothing should be checked before use and replaced if damaged
- Biologically contaminated protective clothing should be disposed of in specially designed rubbish bag marked with " biological hazard "warning and label. Seal the bag and place it in designated location for special disposal

How to put on protective clothing: Take up the gown with the back facing the wearer. Slip the arms through the sleeves first and tie the collar string behind the neck. Then tie the string around the waist

How to take off protective clothing: Loosen the collar string. Slip off the sleeves on both sides and the upper part of the gown. Turn the gown inside out. Roll it outward and dispose

Goggles/Face shields

- Safety goggles/glasses and face shields can protect the eyes from contacting pathogen-carrying blood, droplets or other body fluids which may then enter the body through the mucosa;
- Standard goggles should be chosen
- Glasses without side shields can only protect the front from liquid splash
- Goggles fi t the face snugly and therefore are better than glasses in eye protection
- If necessary, face shield should be used to protect the whole face
- Both face shields and goggles/glasses should be cleaned with liquid soap regularly. If contaminated by blood, they should be soaked in 1:49 diluted liquid bleach and then rinsed with clean water. Place them in plastic bags after wiping dry and store them in a cabinet;
- Check them regularly. Replace them if out of shape, cracked, scratched or fogged;

How-to put-on goggles: Hold the goggles with one hand and place t hem in front of the eyes. Put the head band around the head and adjust to fit.
How to take off the goggles: Hold the goggles lightly and slip off the head band. Keep the goggles in a proper place or sterilize them.
How to put on a face shield: Before use, assemble the face shield according to instructions given by the manufacturer. The way to put on and take off a face shield is similar to that of goggles.

Gloves

- Gloves protect the hands from contacting blood, droplets, body fluids and other body tissue of the infected, or pathogen-contaminated objects and can avoid infection when touching the
- eyes, mouth or nose afterwards. Gloves can also pro tact open wounds from contamination by pathogen;
- Most gloves are disposable after use;
- Standard gloves should be chosen (for examples, EU EN 374; U.S. ASTM F1670, ASTM F1671);
- Check whether the material used for the gloves is resistant to chemicals. Ask for details from the glove's suppliers;
- Gloves should fit the hands snugly but they should not hamper movement or affect sensibility;
- Keep the nails short to avoid piercing the gloves;
- Two pairs of gloves might be worn in handling highly hazardous substances;
- Wash hands thoroughly before and after use;
- Check if there is any puncture before use. To do so, roll up the open end of the glove to see if it can trap air inside (see diagrams below). A punctured glove should be replaced immediately. (N.B: Do not blow the glove

directly to avoid direct contact of the mouth and nose with the glove.);

- Contaminated gloves should be disposed of in special rubbish bag marked with "Biological hazard " warning and label. Fasten the bag and place it in a designated location for special disposal;

How to put on gloves: put them on before handling any blood or objects with potential biological hazards. Wear a pair that fits the hands and appropriate for the job;

How to take off gloves: change or take off the gloves every time after contacting a patient or handling laboratory specimens. Disposable gloves should never be reused. To take off the gloves, grab the rim of the left glove with the right hand and then pull it off away from the body to turn it inside out. Then use the inside of the left glove to cover the right glove and peel it off gently. Dispose the gloves. In this way, there will be no skin contact with the outside of the gloves.

Shoe covers

- Shoe covers prevent pathogens from being carried outside the workplace.
- Shoe covers are usually disposable after use.
- Boot covers off Erfurt t her protection. Cover the boots with the trousers of protective clothing to prevent contaminants from getting into the boots.
- Shoe covers should be water resistant and skid proof.
- The size should fit so as not to hamper movement.
- To ensure their protectiveness, all personal protective equipment requires correct selection and use, as well as
- proper maintenance and storage. Re-useable protective equipment should be cleaned and sterilized thoroughly before they are used again. Damaged items should be replaced immediately.
- When using the complete set of protective equipment, medical personnel should follow strictly hospital guidelines on infection control. Other general frontline workers such as cleaning staff should refer to the following order in putting on protective equipment. However, this order has to be adjusted ed according to t o t he works environment to prevent cross-contamination.
- The items taken off should be disposed of in special rubbish bag marked with "Biological hazard" warning and label. Fasten the bag and place it in a designated location for special disposal.

Sterilization

Sterilization is the process using ultra heat or high pressure to eliminate bacteria, or using biocide to eliminate microorganisms, including spores in bacteria. A complete sterilization process should include disinfecting the contaminated premises and thorough cleaning of any residual toxic substances, to ensure that employees would not be harmed through exposure in the risk area. Effective sterilization depends on the strain and number of microorganisms, the level of organic material present, the properties of the organisms to be. limited, and the duration, temperature and concentration of the sterilizing agent. Sterilization must be carried out by following strictly safety guidelines and taking personal protection to safeguard the health and safety of employees. There are many kinds of sterilizing and antiseptic agents, the most common ones being liquid bleach and rubbing alcohol. Han ds must be washed thoroughly after taking off any personal protective equipment.

Personal hygiene

Washing hands with liquid soap is the simplest and most basic method to avoid infection. However, it is often neglected Wash hands before and after work. Also wash hands immediately before and after wearing protective clothing, uniforms or gloves to reduce the possibility of infection.

Conclusion

Biological hazards can kill. Or they may cause discomfort and affect the health and performance of employees at the very least. We have to be vigilant in preventing and controlling biological hazards to take the work environment a safer and healthier place.

Several weather Condition:

Know the risk for severe thunderstorms and/or lightning within the HWS campus area. The National Weather Service (NWS) will issue warnings to identify locations in the path of approaching hazardous and severe weather.

Tornadoes and severe thunderstorms can and do occur at any location, any time of day or night and any time of year

given the right atmospheric conditions Identifying a safe space in your residence hall and other campus buildings will significantly reduce your chances of becoming injured by the severe weather

Hazardous weather may produce the following: § Lightning § Tornadoes § Straight-line which can exceed 125 miles per hour § Flash floods and floods § Hail

Severe Thunderstorms · Actions to take: § At the first clap of thunder, go to a large building or fully enclosed vehicle and wait 30 minutes after the last clap of thunder before you go back outside. If a sturdy building is not nearby, get into a hard-topped metal vehicle and close all the windows. Stay inside until 30 minutes after the last rumble of thunder. § If you hear thunder, don't use a corded phone. Cordless phones, cell phones and other wireless handheld devices are safe to use. § Keep away from electrical equipment, wiring and water pipes. Sensitive electronics should be unplugged well in advance of thunderstorms. Don't take a bath, shower or use other plumbing during a thunderstorm § Stay away from metal conductors such as wires or fences. Metal does not attract lightning, but lightning can travel long distances through it.

Lightning Actions to take: If you can hear thunder, you are within striking distance of lightning. Seek safe Shelter immediately! There are several ways to reduce risks from a lightning strike to Avoid open areas and stay away from isolated tall trees, towers or utility poles. Do not be the tallest object in the area. Lightning tends to strike the tallest objects in the area. o Immediately decide where you'll go for safety and how much time it will take you to get there. Make sure you can safely reach your intended destination. o If you cannot make it to shelter, crouch close to the ground and separate. (Do NOT lie down.) o Postpone activities. Before going outdoors, check the forecast for thunderstorms. Consider postponing activities to avoid being caught in a dangerous situation.

Risk of Physical injury to the person

Due to unsafe action of the person working or unsafe conditions prevailing in the plant, there is a risk of minor physical injuries. We have taken following precautionary action to control this risk.

(a) All moving / rotating parts of the machinery are provided with suitable guards, and they are maintained in their position.
(b) Any unsafe condition noticed is suitably rectified.
(c) Job training for all levels of employees. Safety rules are followed.
(d) First -Aid box & P.P.E. are kept in the plant.
(e) Adequate lighting arrangement in the plant and good housekeeping.

Handling of Chemicals and Built- In Safety Arrangement

Liquid Chlorine

- 27 Nos. of chlorine sensors are provided and are linked with water curtain system. Activation of sensor triggers the water curtain system at chlorine storage area and two sensors provided at Security Gate.
- Pressure relief devices are provided in all Cl_2 pipelines.
- Safety seals are provided at all joints of Cl_2 pipelines.
- To neutralize Chlorine vapor scrubber system is provided.
- Water Curtain system provided at Cl2 Bullet area to Neutralize Cl2 Gas in case of leakage.
- On-off valve is provided on suction of chlorine compressor.
- Chlorine compressors to rectifiers are provided with interlock.
- All the chlorine pipelines are colored yellow.

Caustic soda

- The following precautions are taken while handling NaOH.
- Use rubber gloves, an apron, rubber gumboots and face shield.
- Use splash proof goggles for protection of eyes and protective equipment to avoid burns due to splashing of the solution.
- Eyewash and safety showers are provided.

Methanol

- Interlock for high high-level switch in the tank is provided to trip the un loading pump.
- Earthling provision is ensured for tanks, piping and flange joints.

Sulphuric acid

- Kerby wall is provided to contain spillage / leakages, acid proof tiles are provided.
- Acid Resistant Full Body Suit Provided near to Tank farm.

Hydrochloric acid

- Anhydrous (100%) HCl is not stored. It is carried from Block A to Block B in CMS plant through a pipeline in gaseous form. The available storage tanks capacities are 4 Nos. of 50 m3 in CMS Plant, 01 No. of 26 m3 in CA plant. The MOC of tank is PPFRP.

Ethanolic KOH

- Interlock for high high-level switch in the tank is provided to trip the unloading pump.
- Earthling provision is ensured for tanks, piping, and flange joints.

Environmental impact assessment:

- Environmental Impact Assessment may be defined as a document containing environmental analysis which includes identification interpretation, predication and mitigation of impacts likely to be caused by proposed set of actions or project.
- The environmental elements those are likely to be affected are to be identified, categorized as air, water, land, sound, ecology, human aspects and economical and resources. Some of these attributes and their impacts are very closely connected to animal plant and human life.
- The environmental impact is measured in terms of changes in attribute values with and without project activity.
- dentification and evaluation is necessary for solid, liquid waste quantity and quality, gaseous emissions, displacement, human settlements, land scape, vegetation, water courses, aquatic flora, fauna hazards etc.
- Environment includes human beings, other living creatures, plant and property.
- To consider societal risk where about soft the people at site should be known. They are in two groups, 1. Those at work on site and 2.Those living and/or working in vicinity.
- The details of the off-site surroundings areas are collected and details are furnished in **Annexure No. 24 (Internal Telephones) & Annexure No. 25 (External Telephones)**
- During Storage and manufacturing process, solid, liquid and gaseous waste is generated as indicated in **Annexure No. 8 (Trade Waste Disposal).** To avoid land air &water pollution and protect environment, the Company has provided various certain pollution control Equipment's / plants, and some are effectively operated and maintained.

1. **Liquid effluents:** The liquid effluent from each area is taken in to centrally located effluent treatment plant.
2. Gaseous Effluent: Scrubbers are provided for neutralizing toxic vapor thus no direct gaseous effluent is generated and vented into atmosphere.
3. **Solid waste:** - Solid effluent is treated outside the plant by an authorized third-party agency. **Annexure No. 8 (Trade Waste Disposal)**
4. The company has obtained the necessary N.O.C and consent from Gujarat Pollution Control Board and various discharge parameters are reasonably maintained during normal course of operation. The facility is monitored from time to time.

Plant Layout

- The GUJARAT FLUOROCHEMICALS LIMITED has manufacturing facilities in 12/A GIDC, Dahej Industrial Estate, Bharuch.
- Plan of the factory premises showing the situation / location of various departments indicating boundary wall entry and exit gate, location of various departments and plants, hazardous storage area, emergency control center, location of fire extinguishers, first aid center, process area, boiler house, situation of siren, assembly point, DG room, main office etc.
- A Schematic diagram is attached. **Annexure 03 (Factory Lay Out)**

GUJARAT FLUOROCHEMICALS LIMITED

Process Description

A. Chlor-Alkali Plant

This plant is designed to produce Liquid Chlorine of 337 MT / Day and Caustic Soda of 11400 MT / Month based on state of the artIon-exchange membrane cell process developed by Asahi, Japan. The Chlor-Alkali plant is designed to produce 380 TPD caustic soda based on the Ion Exchange Membrane Technology. In the electrolysis process, hydrogen gas and caustic soda are produced in the catholyte compartments. Chlorine gas is produced in the anolyte compartments. Hydrochloric Acid is manufactured from Cl2 and H2 gas generated in the electrolysis process, in hydrochloric acid synthesis unit. The process consists of following sections:

1. Primary brine purification,
2. Secondary brine purification,
3. Electrolysis,
4. De-Chlorination,
5. Caustic Soda Evaporation,
6. Cl2 gas washing &cooling, drying,
7. Cl2 gas compression and liquefaction,
8. Cl2absorption,
9. H2 gas washing
10 Chlorine Synthesis

- The Chlor-Alkali Plant is controlled by DCS to provide an Integrated Plant Control with following associations:

i. Distributed Control System (DCS)
ii. Safety Interlock System
iii Remote Control Panel for rectifiers
v. Instrument Panel with monitoring and alarm modules, recorder for Cl2 and H2 gas Pressure /differential pressure

Brine solution is used as feedstock, and it is purified in order to remove impurities before sending to Electrolysis Unit. Raw salt is dissolved with return brine solution from electrolyzer, and it is sent to Reactor with sodium carbonate, barium carbonate and caustic soda to exchange the calcium, magnesium and other multivalent ions present in the raw brine. After this reaction, brine solution flows into clarifier to settle suspended solids and the clear liquid is sent to Pre-coat type ceramic filters and Ion-exchange column for further purification. Electrolysis Unit is composed of Electrolyzer, Anolyte and Catholyte circulation facilities. Each electrolyzer of 142 cells is designed to produce 385 ton/day of Caustic Soda as 100% at the current density of 6.0 kA/m2. The purified brine is supplied to anolyte compartment, where the chlorine gas (Cl2) is generated and then sent it to Catholyte compartment, where hydrogen gas (H2) and Caustic Soda are produced. Wet Cl2 undergoes washing, Cooling, Drying and Compression processes and finally stored in a Liquid Cl2 Storage tank by Liquefaction process. Wet H2 gas from the Electrolysis is sent to H2 gas Scrubber. The depleted brine from the electrolysis section is pumped to De- chlorination Tank, which is kept under vacuum by Steam Ejector. The dissolved Cl2 is stripped together with water vapor and is cooled in De-chlorinationCooler.TherestillremainsasmallamountoffreeCl2, which is removed by adding Sodium Sulfite solution. Then, the brine is sent to Primary Brine Purification section. Caustic soda solution from Electrolyzer is fed to Caustic Evaporation Unit for purification. Various raw materials required such as NaCl, Flocculent, Sodium Carbonate, Barium Carbonate, Hydrochloric Acid and Sulfuric Acid are stored in separate storage areas. Utilities such as Steam, Nitrogen, raw water and DM water are supplied from the main utility area. Chilled water and cooling water requirement is met by dedicated chilled water and cooling water plants located in the caustic soda plant area. Chilled water consumption in the plant is about 300 m3/hr. and plant capacity is 250 TR. Cooling water consumption in the plant is approximately 2000m3/hr.

B. Chloromethane Plant

The CMS Plant is designed to produce 310 TPD of Chloromethane which are Methylene Dichloride, Chloroform and Carbon tetrachloride. The process is carried out in two stages:

Hydro-chlorination in which Methanol gas reacts with HCl gas to produce Methyl Chloride (exothermic reaction) and Therma Chlorination of Methyl Chloride with Chlorine to produce Methylene Dichloride, Chloroform and Carbon Tetrachloride as per the requirement by altering the feed ratios. The main product produced is Chloroform and this is fed as raw material to the existing R-22 Manufacturing. The process consists of following sections:

i. Hydro Chlorin section Unit.
ii. Chlorination Unit.
iii. Product Rectification Unit.
iv. Hydrogen Chloride Absorption Unit.
v. Regeneration and Drying Unit.
vi. Acid and Alkali storage Unit.
vii. Refrigeration Unit.
viii. Steam and Condensate Recovery system.

The CMS Plant is controlled by Distributed Control System to provide an Integrated Plant Control with following:

1. Safety Interlock System
2. Remote Control Panel for rectifiers.

The feedstock Methanol (CH_3OH) and Hydrochloride (HCl) react to produce Methyl Chloride in Hydro chlorination unit. This product is sent to Chlorination unit with Chlorine gas (Cl_2). Both of them undergo thermal chlorination and produce a mixture of Dichloromethane, Chloroform ($CHCl_3$) and Carbon Tetrachloride (CCl_4). This product mixture is rectified in Rectification unit and dried by azeotropic drying. Most of the by-product HCl from chlorination unit is again sent to hydro chlorination unit and the excess HCl is absorbed in HCl absorption unit. This absorbed HCl and process water formed concentrated hydrochloric acid, which is then stripped in the organic stripper to remove organic matters.
The off-gas containing HCl and Cl2 are neutralized with NaOH and water. The spent NaOH containing Chloromethane (CMS) mixtures and off-specific CMS are collected and re generated through CMS dryer and sent it to product rectification unit. According to process requirements, exhaust condenser in the hydro chlorination unit, chlorination unit and refrigeration unit adopt R 22 evaporation to exchange heat with the process fluids. In addition to that, storage tanks receive and store concentrated sulfuric acid, dilute NaOH and dilute H_2SO_4 as needed in major process units. Steam and Condensate recovery system is also provided to recover steam condensate from the plant. Various raw materials required such as Methanol, HCL, NaOH and Sulfuric Acid are stored in separate storage areas. Utilities such as Steam, Nitrogen, raw water and DM water are supplied from the main utility area.

C. TFE, PTFE and PT- PTFE Plants

- This plant is to manufacture TFE, PTFE, PT-PTFE and DPTFE using captive available R 22 of about 112 MT/day as the feed stock for the production of TFE and to produce PTFE resin. The annual production capacity on the basis of 300 working days per year is TFE of 7,680TPA and PTFE of 1650 MT/Month.

- The PTFE plant is designed to produce 1650 MT/ Month of Poly Tetra Fluoro Ethylene i.e., suspended middle grain and fine grain PTFE resin. The process is mainly carried out in two stages:

i. Thermal cracking of R22 with over-heated steam to produced TFE.
ii. Polymerization of TFE with De-ionized water and reduction –oxidizing system to produce PTFE.

The process consists of following sections:

1. TFE monomer metering.

2. Suspension polymerization.
3. Crushing, washing and drying of PTFE.
4. Air- jet pulverization process.
5. Packing and storage.

The PTFE Plant is controlled by DCS to provide an Integrated Plant Control with following associations:

1. Distributed Control System
2. Safety Interlock System

Fresh and recycled Chlorodifluoromethane (R22) is mixed in a vessel and enters into Steam heating furnace and to the Reactor for cracking. Cracked gas is composed of C2F4, HCl, un- reacted R22, excess steam and traces of other cracked products. They enter into a Graphite condenser after rapid cooling in a Quencher. The excess steam and HCl are condensed to form dilute hydrochloric acid and transferred to either neutralization chamber or storage vessel. Uncondensed cracked gas is neutralized and then sent to a buffer tank.

The cracked gas enters into the three-stage compressor unit through a buffer tank, cooler and refrigeration dryer to remove excess moisture. The dry process gas is sent to rectification units for further purification of TFE monomer after de-oxidation process and sent to storage tank through condenser. The un-reacted R22 from rectification units is recycled to the reaction system. Liquid TFE monomer is sent to Polymerization reactor with de-ionized water after heating, vaporization and compression. The PTFE polymer with mother liquor from reactor is sent for crushing, washing by fresh de-ionized water and drying. Further, PTFE resin is sent, to and dried in the hot air blowing and cold air blowing system and finally it is separated according to its size in a cyclone separator.

post treated PTFE (PT-PTFE) is obtained from following methods depending upon customer requirement. The middle size PTFE resin is fed to air jet mill continuously and smashed by accelerated impact and obtained PT- PTFE's grain size is varying from 10 to100 Microns. Dry PTFE powder is treated in Heating Ovens at various temperatures to get desired quality of PTFE as per Market requirement. Dry powder is treated in Reactor along with water and Perchloro-ethylene at various temperatures to get the properties of free-flowing PTFE powder.

Various raw materials required are TFE, Aqueous alkali, Disodium hydrogen phosphate, Ammonium per sulfate, Sodium bisulfate, Ferrous sulfate, De-ionized water and Silica gel. Utilities such as N2, Instrument Air and Process Air, Cooling medium (-15°C CaCl2 Brine, - 35°C CaCl2 Brine, -5°C aqueous Ethylene Glycol), Saturated steam, Electricity 3- phase and Compressed air are supplied from the main utility area.

D. Captive Power Plant

GFL has set up a 26MWCo-generation plant, which represents the combined production of heat and power through a conventional energy generation system. Further Thermal Power Plant of 26 MW using Coal and Hydrogen as fuel has been introduced with net steam 195ton/hrs. Also, 94 MT/Day Coal using for power generation & meeting the complex Steam demand.

This plant is designed to produce electric power for captive power requirement, process steam through waste heat recovery boilers using hot flue gases coming out of the gas turbines. In addition to that the plant has been designed to operate its gas turbines with augmented output by means of reducing the sensible heat and partially reducing the moisture in the combustion air through the Vapor Absorption Machines (VAM) of 330 TR capacity driven by the hot engine jacket cooling water. Fuel is natural gas with Methane number greater than or equal to70.

The minimum and maximum gas pressures for operation are 3.5 and 6 bar (g), respectively. Steam is produced at the net rate of 195000 kg per hour and at a pressure of 12.0 kg/cm2 (g) and temperature of 191°C. Makeup water is added at 65°C and 4 kg/cm2 (g).

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E. A & H Plant

Process Description of HCFC R-22 for TFE feedstock

Anhydrous Hydrofluoric Acid, for captive consumption, is manufactured by reacting Fluorspar with a mixture of Sulphuric Acid and Oleum. Wet Fluorspar is fed to the inlet of Flash Dryer. The dry Fluorspar from Cyclone is fed to the Rotary Kiln through the Storage Silo. The Fluorspar, after drying, is fed to the Rotary Kiln along with a mixture of Sulphuric Acid and Oleum, to produce AHF and By-product Gypsum (CaS04) as per the following reaction:

$$CaF2\ (5) + H2S04(1) \xrightarrow{\text{Heat}} 2\ HF(g) + CaS04(s)$$

The reaction is endothermic and there is no possibility of any run-away reaction.

The Rotary Kiln is indirectly heated by hot flue gases. The Gypsum from the Kiln is neutralized with Lime and discharged as By-product.

The HF vapor is passed through the Kiln Column. The clean HF from the Kiln Column is condensed in HF condensers by means of Refrigeration. The crude condensed HF liquid is fed to the Distillation Columns through Crude HF Storage Tank. Pure AHF is withdrawn and sent to receiving tank after due Analysis.

The entire HF Plant is kept under negative pressure and there is no possibility of leakages of HF from the equipment to the atmosphere.

Raw Materials Anhydrous Hydrogen Fluoride (AHF) and Organic CHCI3 for R-22) are fed to Reactor (01). The Reactor contains special Penta chloride Catalyst which is used to catalyze the reaction between. AHF and Organic to produce Refrigerant gas as per the following reactions:

$$CHCI3\ (I) + 2HF(I) \longrightarrow CHCIF2\ (g) + 2HCI\ (g)(R22)$$

The Crude Refrigerant gases from Reactor enter the Stripper (02) to condense and return unconverted Reactants. $CHCl_3$ to the Reactor.

From Stripper, Crude gas mixture enters HCI Distillation Column (03). Top product of Distillation Column enters HCI Absorption Unit, which consists of Alumina Towers (07, 08), HCI Absorber (09) and Tail Tower (10). Here, HCI is generated by counter current absorption with water. The bottom product of the Distillation Column (03) enters exchanger where it is mixed with organic and is finally collected into Phase Separator (04). The top layer of the Phase Separator (04) is collected into the AHF Storage Tank (05) and is finally re-fed into the Reactor (01). The bottom layer of the Phase Separator enters Heavies Recovery Column (06). The bottom product of the Heavies Recovery Column (06) is stored into Heavies Tank and is finally re-fed into Reactor (01). The top product of the Heavies Recovery Column enters HF Absorption Column (11) where traces of HF are absorbed into Sulphuric Acid and output of the HF Absorption Column enters into Alkali Towers (12, 13) where the Crude gas is scrubbed with Caustic Soda Trisodium Phosphate. The Crude Gases are then dried in Acid Drying Towers (14, 15) where Moisture, is absorbed by circulating Sulphuric Acid, The dry Crude Gas is passed through Alumina Guard Tower (16), compressedbycompressor(17),liquefiedandstoredinCrudeTank(18).FromtheCrudeTank,theCrudemixtureis fedtoNon-condensableColumn(19)fromtopofwhichNon-condensableareventedout.ThebottomproductofNon condensable Column enters 1st Distillation Column (20), where R-22 is withdrawn from the top as Final Product, bottomfromtheColumn(20),whichmainlycontainsHighBoilerssuchasR-21andCHCl3isrecycledtotheReactor (01),

The Finished Product Refrigerant Gases withdrawn from respective Column tops are then sent to the Daily Storage Tanks. After duly approval of the Quality, the R-22 is sent to final storage for TFE feed stock.

The 32 % HCI obtained from the Absorption Unit is taken to the Storage Tank from where it is sold to Customers. The Spent Liquor from Alkali Tower is taken to Effluent Treatment Plant, for suitable treatment and disposal. The Spent Sulphuric Add from Acid Drying Tower (14, 15) is mixed with Oleum to make up the strength (11) is stored Into Sulphuric Storage Tank T-3107A/B and is finally fed to the Kiln.

Equipment reference no. is mentioned in block diagram of Plant-H.

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F. Surfactant Recovery Plant -1

In the manufacturing of PTFE, TFE is polymerized in DI water with the help of Initiators. Fluoro surfactant is present as the dispersing medium. This Flour surfactant remains in the Latex coming from the reactor. This Fluoro surfactant has to be removed from the Product before it is sent to the market. For this following process is followed.

a. First secondary surfactant (Tegretol) is mixed in this Latex. So that the product becomes stable. This Tegretol is Non-Fluorinated surfactant and can remain in the product as a stabilizer for the product
b. So after Adding this secondary surfactant the primary surfactant is removed by passing this liquid through ion exchange columns. Where the primary surfactant is captured by ion exchange resin and final product without Primary surfactant goes for further concentration and packaging of the product.
c. Now the resin contains this primary surfactant which has to be removed and to be recycled back to the process.
d. For removing the surfactant from resin solution of Ammonium Chloride 2%, Methanol 70% and water 28% is passed through this column. So, the surfactant get transferred to the is solution
e. This solution now contains mixture of following:

1. Surfactant
2. Methanol
3. Water
4. Ammonium Chloride

Methanol is separated by distillation under vacuum so that the se can be separated and all can be re used and can be recycled back to process. The methanol recovered has concentration of around 70 to 80 % which cannot be used in the process.

F. CaCl2Plant

Calcium chloride is one of the most versatile of the basic chemicals. It has been produced commercially for well over the years. The properties and characteristics of Calcium chloride make it useful in a large number of applications. Commercially Calcium chloride is produced in following forms. Liquid Calcium chloride is manufactured in concentrationsof20%to45%anditisalsoavailableas32%foodgradeformulation.

The object this plant is to utilize of Hydrochloric Acid by neutralizing it with Calcium Carbonate. The Calcium Chloride is produced by the reaction of Calcium Carbonate ($CaCO_3$) with 32% Hydrochloric Acid in a Reactor. The resulting 35% Calcium Chloride solution is produced & further it is neutralized with lime to make it free from any acidity. It is also Clarified/ filtered to remove all suspended impurities. The clear Calcium Chloride solution is then can be transferred for further use in evaporation or granulation plant to make anhydrous/ solid material. The Calcium Chloride in the form of powder / granules / flakes are easily transportable & salable in the market in India & abroad.

Process- Calcium Chloride

The Calcium Chloride is mainly produced commercially by Limestone & Hydrochloric Acid reaction. The other production processes such as recovery from by product or naturally available forms are not covered here.

Limestone-Hydrochloric Acid Process

Limestone can be treated with hydrochloric acid to form calcium chloride and carbon dioxide:

$$CaCO3+2HCl \longrightarrow CaCl2 + CO2 + H2O$$

If concentrated (32%) hydrochloric acid is utilized, the concentration of $CaCl_2$ in the produced solution will be approximately 32% and further evaporation is only needed when flakes/ granules are produced. The purification of the product is mainly accomplished by adding Ca (OH)2 as described in the natural brine process.

$$Ca(OH)_2 + Mg^{2+} \longrightarrow Mg(OH)_2 + Ca^{2+}$$

The high purity of the produced carbon dioxide (CO2) makes it suitable for applications within the food and pharmaceutical industries e.g., in the production of carbonated soft drinks. Extremely pure calcium chloride products can be obtained using this process if the purity of the hydrochloric acid is sufficient. Hence, the process is well suited for producing food grade products. It is also an environmentally friendly method to utilize by-product hydrochloric acid.

Design Basis

The design of the process is based upon the following steps: neutralization of hydrochloric acid with limestone to produce a 35% calcium chloride solution. If required, concentration of the $CaCl_2$ Solution to more than 50% using a double effect evaporation system, production of flakes using the flaker, calcinations of the flakes in a rotary calciner to further concentration & packing. Alternatively, 35% calcium chloride solution directly fed to Spray Dryer
/ Granulation Plant.

Neutralization of HCL

The neutralization of HCL with limestone is carried out as explained above to produce $CaCl_2$ and Co2 as by product. The $CaCl_2$ solution which contains un-reacted solids (impurities from the limestone) settled down in bottom of the Reactors which can be removed by drain Valves / manhole periodically to settling pits. The $CaCl_2$ solution which contains un-reacted solids, free acid and Chlorides of other undesirable metals like Magnesium etc. (impurities from the limestone) flows by gravity to Clarifier through retention tank. Milk of Lime Solution is dosed in Reaction Tank wherein the Milk of lime reacts with free acid and other metallic chlorides. The Calcium Chloride solution becomes neutral and other metallic chlorides converted in to metallic hydroxides which are insoluble in water.

Clarification / Filtration:

The neutralized Calcium Chloride Solution impurities get settled down in Clarifier which is continuously containing insoluble impurities. The Flocculent is added in the Solution overflowing from Retention Tank to Clarifier. The undissolved solids get settled down at the bottom of Clarifier which are intermittently discharged into settling pit. The overflow from Clarifier is discharged into Calcium Chloride Solution Storage Tank. The neutralized clear solution Calcium Chloride can be filtered by Inline Polished Filter and transferred for further process of Concentration and granulation. The sludge is filtered in a separate filter Press where the cake builds up on the filter cloth. The filtrate is collected in filtrate tank and the solids are discharged.

CO2 Washing and Cleaning

The CO2 gas is transferred to CO2 Liquefaction Plant for further processing. At CO2 Plant it passes through the Scrubber & demister free of the droplets. The Washed CO2 is then discharged to further processing for Liquefaction & Dry Icing Plant or vent off to the atmosphere.

G. CO2Plant

Purifying system

Two lines of CO2 gas is mixed in buffer tank (V0101) then transferred to washing tower (T0101) to remove the HCl. The washing tower has two stages for washing. First, to wash with circulation water by washing pump (P010A/B), then to purify with primary water, so to ensure HCl content can satisfy requirement. Washing pump is one in run one stand-by. The washing tower level is automatically controlled and can control the washing effect by controlling the level. After washing, the gas goes into separator (S0101) to separate saturate water, and then it is compressed by compressor(C0101A/B).

CO2 gas is compressed to 2.4~2.7 MPa and dehumidified by dehumidifier (E0101), to remove part of water by decreasing temperature, so to increase molecular sieve adsorbing time and enhance the adsorption effect. Dehumidifier (E0101) is cooled by utilizing the vent gas from reflux tank (V0102) and distillation tower (T0105)

Outlet gas from dehumidifier (E0101) is dried by dryer (T0102A/B), inside which we use 3A molecular sieve, and the dryer is

one in run one stand-by. When the moisture of molecular sieve is 15ppm, the dryer shall be switched and regenerated. The air is heated by electrical heater (F0101) then blown by a blower (P0102). Hot air passed from the bottom of molecular sieve layer and takes the moisture away. The outlet temperature is 200^{0}C, when the outlet temperature T10102 reaches 120^{0}C or complete regeneration after 30min over 100^{0}C, then stop regeneration process. To cool down the dryer, we use vent gas from dehumidifier (air is not allowed for cooling). To finish the cooling process when the T10102 temperature is ambient, then slightly open the outlet valve of dryer to press and then close for standby.

Dried gas is transferred to pre-rectifying tower (T0103) reboiler (E0102) for heating, part of the inlet gas before reboilering (E0102) goes into bottom of distillation tower (T0105) and heated, then gather with the gas and from the bottom of distillation tower, goes into pre-rectifying tower, where to remove the heavy component in gas. T0103 is cooled and washed by using the liquid from reflux tank (V0102). We control the outlet temperature TICA0106 as - 15^{0}C by controlling the liquid level, then the gas pass through absorber (T0104A/B)

Absorber (T0104A/B) can remove the heavy component which cannot be removed by pre-rectifying tower (T0103), and it is one in run one stand-by. Absorber regeneration shall be as per gas component data. Adsorbed is cooled by using the vent gas from dehumidifier (E0101). If insufficient, open the line PG0107A. (Air is not allowed for cooling). The process and parameter is the same as dryer regeneration operation.

Gas from absorber (T0104A/B) is transferred to liquefier (E0103), then to reflux tank (V0102) for primary gas liquid separation. Liquid Co2 in reflux tank divides into two parts, one goes to pre-rectifying tower (T0103) by reflux pump (P0103) and one goes into distillation tower (T0105). Co2 is controlled in distillation tower by level.

The distillation tower is heated by bottom coil; light part is vent from top and high purity liquid Co2 comes out from bottom. After testing, qualified Co2 liquid is transferred to storage tank for filling.

Refrigeration system

The low pressure NH_3 gas from liquefier (E0103) goes into NH_3 compressor (C0201A/B) and compressed to high pressure, high temperature NH3 gas. Then it is transferred to evaporative condenser (E0201) and changes to normal temperature, high pressure NH_3 liquid. The liquid NH_3 goes into siphon tank (V0202) and then to storage tank (V0202), and goes back to E0103 for evaporation, repeating the cycle.

Oil is cooled by Liquid NH_3 in NH_3 compressor (C0201A/B). LNH3 is from the bottom of siphon tank (V0202), GNH3 return to V0202 and then goes into evaporative condenser (E0201), repeating the cycle.

Storage

Liquid CO2 from storage tank is filling into truck by filling pump, to reduce loss in this process and truck gas line can be connected with storage tank gas line (VT0302), to make the gas return to storage tank, further goes back to compressor (C0101A/B).

H. FKM Plant

Hexafluoro propylene and Vinylidene fluoride are the main monomers for producing FKM 2,6 rubber. These two monomers in gas form taken in 02 nos. monomer mixing tanks among which one is dedicated for reactor pressurization and the other is for polymerization. The composition of these tanks is different and maintained as per recipe. After preparation of gas mixture, it is fed to Polymerization reactor by the gas compressor. Reaction pressure and temperature maintained as per recipe value. After feeding the recipe amount of monomer mixture feed is cut off and the reactor is vented till the pressure comes to atmospheric pressure. During this venting process reactor is also cooled to 30°C by cooling water circulation through reactor jacket. After that latex formed in the reactor is discharged to degassing tank where degassing done by evacuation and nitrogen flushing simultaneously and the latex temperature is further cooled down to 20-25°C. Then after checking viscosity of the latex it is transferred to latex storage tank. It is stored there till the downstream is ready. Then this latex is coagulated in coagulator by adding coagulant into coagulator. By this process polymer gets separated from the latex and it is transferred to washing tank

where vigorous washing is done of the polymer. Washing continued till the wash water effluent pH comes above 6.0. Then the material is dumped on to a rubber tank from where the material is loaded on trays after dewatering of the polymer. The trays are then placed inside the tray dryer in which drying of the polymer takes place for 24hrs at 95°C. After drying material is weighed and packed in PPCP drums. These drums are then taken in the close mixer where additives are added for pre compounding and thereafter the material is turned into a sheet in a two-roll mill. After that sheet is cut and placed on trays for cooling (cooling is required as the material is heated up during the process of mixing and sheeting). When the sheet temperature brings down to ambient temperature then this sheet is packed in the packing boxes as per requirement.

I. ETFEE Plant

Manufacturing of E-TFEE Product Using Reaction Between 18% Ethanolic-KOH Solution & TFE Gas. The process for the ETFEE production consists of 3 steps:

1) Unloading of the Raw material into storage tanks: One of the raw materials used in the manufacturing of ETFEE is 18% KOH in Ethanol. This will be supplied to the plant by tankers which are to be unloaded into tank in an approved tank farm area.
2) Reaction: The Ethanolic KOH reacts with TFE to give the ETFEE at a temperature of 50±2°C. The process steps involve
   - Pumping a fixed quantity of the Ethanolic KOH into the reactor
   - Cooling the mass and qualifying the reactor to make it oxygen ree.
   - Feeding the required quantity of TFE at a fixed rate and allowing the reaction to take place in controlled conditions.
   - Post completion of the reaction, water addition for solid dissolution, cooling the mass and evacuating the residual gases safely. Typical batch cycle time is 8hours.
   - After evacuation, the batch is transferred to a hold vessel and thereafter to the designated tank in approved tank farm.
3) Loading of Product into tanker: The crude product made in the process is sent via tankers to Ranjit Nagar facility for purification and ethanol recovery.

J. R-125 (Penta Fluor ethane)

The process includes CO removal, raw material metering, reaction, compression, distillation, drying, recovery, HFC-125 metering and storage. Refer to P&ID (BD1601-301～312) for details.

5.2.1 CO Removal

The gas from LV-1 MSU of TFE plant, under normal temperature and pressure of1.3kg/cm^2 enter to the pre-buffer tank (V-6801), then it is cooled to 15℃by pre-cooler (E-6801). It is pressurized to 6kg/cm^2 by diaphragm compressor (C-6801), pass through the after cooler (E-6802) cooled to 25 ℃, then go into the after-buffer tank (V-6802). The gas enters the CO absorption tower (T-6800) in countercurrent contact with the solvent (acetic acid copper ammonia solution), the tower top gas go to the mixture buffer tank (V-6809) after ammonia removal through ammonia washing tank(V-6830) and the decompression of control valve. The CO-contained liquid after decompression of control valve at the tower go to the upside of reflux regeneration tower (T-6801). The structure of reflux regeneration tower is refluxing section in the upper, regeneration section in the middle and reducer at bottom. After deamination in water washing tank (V- 6805), the CO- contained exhaust gases from reflux section top go to the waste gas tank (V-6825) for pressure stabilization, then it is pressurized by the blower (C-6803A / B) and sent to incineration. The liquid from regenerator is first cooled by cooling water cooler (E - 6806) and then pumped by solvent recycle pump (P- 6801A / B) to solvent cooler (E-6804) cooled up to 15 ℃, then go to CO absorption column (T- 6800). If the copper ratio is too high in the solvent, add compressed air to the reducer section to regulate the ratio. If total ammonia is too low in the solvent, add ammonia downstream of cooling water cooler (E-6806). If the total copper is too low, solvent out of the regenerator pass by solvent preparation tank (V- 6803) to adjust the total copper. Set solvent collection tank (V-6804) collect copper solvent emissions during shut down and maintenance. 5.2.2 Reaction (BD1601-305～306)

5.2.2.1 Catalyst preparation

Add certain quantity of TBA in reactor (R-6841A/B) and start catalyst circulation pump (P-6844A~C) to make the liquid circulate. Add certain quantity of HF gradually by HF metering pump (P6841A~C) to form complex with TBA and the temperature is controlled by the circulating condensate in jacket. The catalyst is qualified when the mole ratio of HF to TBA reach to1.5~1.9:1.

5.2.2.2 Reaction TFE gas from TFE distillation tower(T-606) side and bottom in TFE plant and the recovered from downstream distillation system is mixed and continuously fed into the TFE stabilizing tank (V-6844). It is heated and mixed with TBA in TFE heating tower (T-6841) and then fed into reactor (R- 6841A/B) through TFE buffer tank (V-6845). The AHF is fed into reactor by HF metering pump (P-6841A~C) after metering. Catalyst continuously circulates in reactor through catalyst preparation tank (V-6849A/B). TFE gas monomer and AHF are continuously fed into reactor to generate crude product HFC-125 under certain temperature and pressure. Crude HFC-125 gas comes out from reactor top and goes through demister cooler (E-6842) to reflux tower (T-6809) to reduce temperature. Then it goes to mixture buffer tank (V-6809) through reflux tower condenser (E-6829) for cooling.

5.2.3 Mixed gas collection, compression, dehydration and deoxidization (BD1601-307～310) TFE recovered from D-PTFE through D-PTFE buffer tank (V-6806) and TFE recovered from S-PTFE through S-PTFE buffer tank (V-6807) for pressure adjustment, then go to the mixture buffer tank (V-6809); Other continuous vent raw gas together with recovered gas emissions from distillation system go into the mixture buffer tank (V-6809).All these gas are mixed with crude HFC-125 from reflux tower. The mixture gas is compressed by the compressor (C-6802A/B), first stage outlet gas enters into the dehydrating tower (T-6802A/B) after cooling and dehydration by cooling dehydrator (E-6807A/B). It is cooled to -10 ℃ by low temperature dehydrating agent and continued dehydrating, then into the secondary buffer tank (V-6810), then go into the compressor for second-stage compression; Second stage outlet gas is cooled by secondary cooler (E- 6809) then go into the dryer (A-6801A ~C), silica gel adsorbed water from the gas, make the gas moisture content less than 100ppm.Then it go to deoxidizing tower (T-6803) remove O2 . If the moisture content of the gas close to 100ppm changes over the dryer, and the block up dryer is activated by steam heating and vacuuming. The polymerization inhibitor terpene via terpene metering tank (V-6813), terpene pump (P- 6803A / B) is supplied to the deoxidizing tower (T-6803), Make up terpene to NO.1 condenser (E-6812) by terpene make-up pump (P-6804A / B) on a regular interval and quantitative. 5.2.4 Distillation system (BD1601-310～312) Gas from the top of the deoxidizing tower (T-6803), passing through feeding cooler (E- 6810), enters No.1 rough separation tower (T-6804). TFE is recovered from sideline to TFE stabilizing tank (V-6844). Distillates from the top of No.1 condenser (E-6812), which contains NCG like R23 is sent to waste gas mixing tank (V-6826). Trace of TFE, R32 and large quantity of HFC-125 left at the tower bottom are continuously sent to No.2 light fraction removal tower (T-6805) by discharge control valve . Light components (including trace of R32, Y3, TFE) with boiling points lower than HFC-125 are rectified from top of No.2 light fraction removal tower (T-6805) passing through the terpene tank (V-6815) and No.2 condenser (E-6815) enter into the waste gas mixing tank(V-6826). HFC-125 from bottom of No.2 light fraction removal tower goes to No.3 distillation tower (T-6806). The side-cut gases HFC-

5.2.4 125 from top of No.3 distillation tower (T-6806) is sent to product metering tank(V-6846A/B) through collection condenser(E- 6826). The gas contain HFC-125 and trace of Y3 at No.3 condenser (E-6818) top recycle back to mixture buffer tank(V-6809).Materials at tower bottom intermittently go into recovery tower (T-6808). Higher purity HFC-125 from top of No.5 recovery tower (T-6808) goes back to mixture buffer tank(V-6809). Liquid at tower bottom are high-boiling residues. They are discharged to residue tank (V-6816). The residues are compressed into steel cylinder at regular intervals and sent out of battery limit to incineration unit for disposal.

5.2.5 Product storage and filling system, and tail gas scrubbing and absorbing syste（BD1601-310～312） When the HFC-125 in product metering tank (V-6846A/B) is qualified after analysis, it can be pumped to product storage tank (V-6847) in tank field for periodical tank wagon and cylinder filling. If the moisture is not qualified, it should pass HFC-125 dryer (A-6841A/B) for drying until the moisture is qualified, then it can be pumped to tank field. If the purity is not qualified, the gas should be recovered back to mixture buffer tank (V-6809). Qualified HFC-125 is pumped by product transfer pump (P-6848A/B) through product storage tank (V-6847) to tank wagon or cylinder. If the moisture is not qualified, it should pass product dryer (A-6842A/B) for drying until the moisture is qualified. The tank wagon and cylinder and related pipeline should be treated by vacuum before filling.

5.2.6 Three waste treatment Liquid waste is discharged to liquid waste pit (V-6820), and regularly sent to ETP for treatment by liquid waste pump (P-6811A/B).（BD1601-313） Liquid at recovery tower bottom are high-boiling residues. They are discharged to residue tank (V-6816). The residues are compressed into steel cylinder at regular intervals and sent out of battery limit to incineration unit for disposal.（BD1601- 312） Waste catalyst in waste catalyst tank (V-6848) is stored in steel drum and regularly sent qualified third party for treatment.（BD1601-306） All Fluoro-contained waste gas vent from plant is collected into waste gas mixing tank (V-6826) and sent to OSBL for incineration. （BD1601-304 The acid gas from HF tanks is washed by scrubber (T-6842) and high vent. The washing

liquid is discharged to liquid waste pit. （BD1601-313） Waste silica gel and molecular sieve are nontoxic and landfill. Condensate is collected from users into condensate collecting tank(V-6819) and mainly sent to reactor(R-6841A/B) jacket for circulation and part is transferred OSBL. （BD1601-313） The heating medium systems is for No.2 reboiler (E-6814), No.3 reboiler (E-6817) and residue tank (V-6816) heating. It contains heating medium tank (V- 6817) and heating medium pump (P-6808A / B) heating medium heat exchanger(E-6843). （BD1601-313） The vacuum system consist of vacuum buffer tank(V-6818), vacuum pump(P-6809A/B). It can be expanded as per actual requirement. （BD1601-309） Where there is a high concentration of TFE, and for equipment or pipeline which is easy to explosive, safety relief facilities must be set.

K. VDF Plant

1. Cracked gas enters the primary buffer tank from atmospheric pressure gas storage after single-stage compression, then dewatered by water calcium chloride tower after drum, then through the mist eliminator and cold removal, and enters the intermediate gas storage. It enters the secondary buffer tank after two-stage compression and reaches the intermediate tank after silica gel absorber drying and pre-/mid-/end cooling.
2. The liquid phase of intermediate tank is discharged into the catcher and enters # 1 tower, low boilers on the top # 1 tower enter acetone absorption tower and then discharged into drum. Tower bottom enters # 2 tower, VDF at the top of tower enters finished product metering tank after liquefaction by collecting condenser. Tower bottom enters # 3 tower to continue fractionating and recover VDF. Liquid at the tower bottom enters # 4, remove low boilers from the tower top. Bottom material enters # 5 tower, F142b at the tower top enters F142b tank after collection, place the bottom liquid into residue tank.

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Plant Location:

This gives an idea of surrounding vicinity and emergency time facilities such as residential premises, factory location, approaches to the factory, etc.

Storage Hazard & Control:

- Storage area in the complex known as tank farm consisting of storage of Liquid Chlorine, Methanol, Sulphuric Acid (98%), Hydrochloric Acid, Chloroform, Liquid Nitrogen, Anhydrous Hydrofluoric Acid, Caustic Lye, VDF, R-142b, HF, TBA etc.
- Storage facility is situated away from the manufacturing plants and fulfilling all rules and regulations.
- All storage tanks of hazardous substances are located within the boundary wall and dyke. As prescribed in the relevant statutory regulations, the entire electrical fittings are of Fire proof fitting.
- Proper enclosures in the form of bund walls have been provided.
- All necessary firefighting arrangements have been provided near the storage area to combat fire emergencies.
- Material Safety Data Sheets for all the raw materials intermediates and final product are attached. Work instructions for loading & unloading of chemicals are properly displayed in English near the area.
- In the factory lay out plan it is shown that where the raw material including hazardous substances are stored. The complete details regarding raw material, finished products, intermediates, by products etc is given in **Annexure-04 (List of raw materials, storage capacity, hazards and controls).**
- Whereas the complete details regarding material identification use , hazardous ingredients of material , physical data, hazardous properties , proper PPEs and first aid measures etc. is described in **Annexure 06 (Process and Vessel / Hazards and Controls).** The list of hazardous raw materials, finished products, intermediates, and by products which are handled, stored and processed is given in below and also in **Annexure 04 (List of raw materials, storage capacity, hazards and controls)**. Material Safety Data Sheets (MSDS) of these materials is attached.
- In Storage of coal, there are explosion hazards which are accentuated as the particle size is reduced and health hazards arising from dust.

- In storage of Hydrogen gas, there are explosion hazards.

List of Chemicals Handled at Site

Sr. No.	Name of the hazardous Chemical (mention concentration if any)	UOM	Quantity Maximum storage capacity	Actual stored (including in process handling)
1	Liquid Chlorine	M3	315 (105X 3)	179
2	Methanol	MT	250 (50X2 +150)	213
3	Sulphuric acid (98%)	MT	608 (100m3 X3 Tanks, 30.5m3)	517
4	Sulphuric acid (88%)	MT	360 (100 m3 X 2 Tanks)	306
5	Hydrochloric acid (31%)	MT	260 (50m3 X 04) (26m3)	221
6	Methylene Dichloride	MT	375 (150m3 X 2) (75m3 X 1)	319
7	Chloroform	MT	237 (100m3& 60 m3)	201
8	Carbon Tetrachloride (CTC)	MT	268 (100m3 & 75m3)	228
9	Natural Gas (NG)	SCM/D	190000, 2.45 bar, 30-40 ^{0}C	NA
10	Coal	MT	15000	13500
11	Hydrogen Gas	Nm3/D	100000	NA
12	Caustic Lye (32%)	MT	310 (117.5m3 X 2	264
13	Caustic Lye (48%)	MT	3576 (400m3 X 3, 1200m3)	3040
14	Anhydrous Hydrofluoric Acid (AHF)	MT	18.07	18
15	Dilute Hydrofluoric Acid (20% DHF)	MT	80	68
16	Flurosilicic Acid (H2SiF6 30%)	MT	100	85
17	Vinylidene Fluoride (VDF)	m3	39	39
18	Oleum	KL	200 (100 X 2 No.)	170
19	R-142-B	KL	79	79

Process and Vessel Hazards & Control

- In this section plant wise hazards of processes, operations and controls provided to cope up with all kinds of abnormalities. The details regarding various controls like exhausts, scrubbers, vents and other operating controls etc. have been mentioned.
- The consequences arising from the release of a toxic material would be time dependent and would vary according to the point of release. The major difference between the release of toxic and flammable materials is that toxic clouds are light and therefore may remain hazardous over greater distances.
- Scrubbers for control of emitted gases, Chlorine gas, Sulphuric Acid & HCl from process vessels.

Process Hazards and Control Measures Provided

The following are the major process hazards due to inherent properties of chemicals and chemical reactions.

(A) Fire Hazards

Methanol, Methylene Chloride, Natural Gas, Hydrogen, Vinylidene Fluoride etc. are the main raw materials responsible for fire hazard. Following precautions are to be taken during processing:

(1) Water Sprinkler System.
(2) Water curtain system

(3) Fire Hydrant System.
(4) Foam Trolleys
(5) Full fledge Fire Station with fire tender.
(6) Portable fire extinguishers are provided in the plant at various places and are maintained.
(7) Water tapping are provided and supply of water is ensured.
(8) Hot work permit system followed.
(9) No smoking in the plant.
(10) Flame proof electrical equipment and wiring wherever required.
(11) Proper PPEs are provided.
(12) "No Mobile use" board is displayed.
(13) Cautionary and Sign board displayed.

(B) Toxic Hazards

Chlorine, Sulphuric Acid, Hydrochloric Acid, Methylene Chloride, Chloroform, Carbon Tetrachloride, Anhydrous Hydrofluoric Acid, are the main raw materials responsible for toxic hazards. Following precautions are taken during processing:

(1) Scrubber System provided.
(2) Detectors are provided
(3) No manual handling as far as possible.
(4) Enclosed processing.
(5) Eyes wash, Safety showers are provided. 24hours water supply is ensured.

There may be very few causes for the occurrence of major emergency during the process due to leakage, spillage, fire, vapor cloud and spread of chemicals. Any abnormality in the process which may lead to such a situation will be controlled immediately. As light delay in decision making may result in to severe consequences.

Running water arrangement and safety showers are provided for use in case of contact with acids / alkalis. Reactors are regularly rested for monitoring corrosion if any. **The following additional measures are taken.**

- The transfer of acids & alkali from storage area to plant is done under supervision.
- The addition of chemicals in the reaction vessel is carefully controlled by experienced workers.
- The temperature is watched and monitored carefully and as supervisor shall constantly attend to the process.
- The work of adding hazardous chemicals shall be done under supervision and by wearing protective wears for hands, feet, goggles and cartridge masks for organic fumes. The feed shall be regulated by standing further away from feeding opening.
- The entire worker working in the entire plant shall wear protective such as gloves, gumboots; apron safety goggles as and when needed.
- Thefollowingprecautionsshallbetakenwhilereplacementoftheflanges.
- Shut down the supply of chemical by closing valve.
- Before opening any portion required safety appliances like hand gloves, acid proof goggles, face shield, helmet, apron and safety shoes and mask should be used.
- Pressure in the pipe lines could be released slowly by opening the drain valve.
- No flanges or joints or any other equipment connected with the process line should be opened abruptly. The bolts joining them should be opened slowly by standing on the side of such opening; a suitable deflector may be put on the flange joint.
- While replacing a piece of pipe, firm supports should be put below the pipe to prevent its slipping and falling down.
- Safety belts shall be used when working at elevated places.

- The ground area underneath the overhead work place should be cordoned off and caution boards should be displayed.
- To enter a vessel for cleaning, airline mask shall be used. All statutory precaution should be followed before entering in the vessel. A constant supervision is also absolutely necessary.
- First-aid measures are out lined in MSDS of hazardous chemical
- Cautionary notice for acid and alkali is displayed at various places in the plant in language understood by workers.

Other Hazards & Control

In the plant, in addition to the storage hazards, process hazards and vessel hazards there are few more hazards having the following details,

(a) Boiler Failure Hazard

(b) Non-Chemical Vessels failure hazard

(c) Hazards due to structural collapse.

(d) Piping/ equipment failure.

(e) Maintenance hazards

(f) Hazards due to failure of electrical installations.

(g) Physical injuries.

a) Boiler Failure Hazard.

- Boiler is periodically checked and the same is tested by a competent authority.
- Routine check-up of the boiler with it sell fittings and connections.
- Necessary maintenance and repair of the boiler.
- To close down the boiler in emergency.

b) Non-Chemical vessels failure Hazard Controls

- Due to infer or quality or poor maintenance or unsafe working condition such hazards may take place.
- To overcome the problem, following steps have been taken.
- Proper maintenance of all machineries.
- Regular checking for corrosion
- Thickness and hydraulic test of vessel.
- Guard to the belt for each motor
- Proper fitting and checking for the electrical connection in the factory.
- Regular checking of suction and delivery line of compressor, blowers, water line, etc.

c) Hazards due to structural collapse

Structural collapse is possible because of any one or more of the following reasons,

- corrosion
- old structure
- heavy load
- extensive vibrations
- heavy stress on structure
- Natural calamity i.e. earthquake, fall of lightening etc.

- Accidents.
- To avoid the above, regular checking is done by a competent authority in above case major emergency may arise suddenly and outside emergency services can be utilized.

d) Piping / Equipment Failure

- All piping materials and equipments materials selected compatible to their services and according to ISI type.
- Periodical inspections and thickness measurement, NDT testing will be carried out.
- Anti-corrosion painting and color coding is followed.
- Hydro test of vessels/ system will be carried out.
- Pressure test (leak test) will be done before every start-up.
- Cooling water will be treated to minimize.

e) Hazards due to failure of electrical installations.

- To prevent any threat, the electrical aspect of various sections following controls is provided.
- Earthling bonding of equipment/motors/storage tank etc. is provided.
- DGsetisprovidedtosupplythepowerandtocontroltheprocessincaseofpowerfailure.
- Flame proof electrical motors and junction boxes provided.
- Emergency lightening is provided.

f) Transformer

Transformer failures are mainly attributed to internal faults, automatic tap changing gear, flash over, arcing in the transformer top high oil temperature etc. transformer failure may sometimes lead to fire or an explosion. Current leakage due to improper earthling may also lead to fire. In case of fire generally cables catch fire immediately due to its nature, this leads to major fire.

(g) Fire Or Bursting of Tanker

In case any vehicle / tanker & truck catches fire or burst / explode on the road or similar event occurs inside the plant area during loading of materials, the impact of such event shall have on the entire plant. Smoke cloud, fire, considerable heat radiation will take place apart from destabilizing civil & mechanical structure.

(h) Leak / Spillage of Toxic Liquid On Road

In case of spillage or leakage of or spillage of liquid on the road, the same affect the employee of Plant. In such case firefighting system shall be kept ready as well as the employees may be asked to assemble to assembly point. Immediate actions by spill control team should be taken to clear the area. And spill control team could be asked to absorb / neutralize the toxic chemicals by suitable absorbent / neutralizers.

Trade Waste Disposal

Details of solids, liquids and gaseous trade waste generated per day and their treatment and neutralizing/inactivating methods with capacity are given in **Annexure 8.**

ETP (Effluent Treatment Plant)

All effluent (process effluent, Washing &Filtrate etc.) from all sections of the plant in acidic, basic and neutral form is transferred to Effluent Treatment Plant, where it is treated by Primary Treatment (neutralization tank, flash mixer, primary clarifier etc.), Secondary Treatment (Aeration tank with activated return sludge process) &then Tertiary Treatment (Coagulation & flocculation (by dosing chemicals in HRSCC, chlorination, filtration by MGF & ACF),sludge generated during the treatment process is

dewatered by decanter &centrifuge(stored at plant site &then disposed to TSDF site. Waste water treatment Plant:

1. Primary Treatment,
2. Secondary Treatment 3.

Tertiary Treatment

There are different streams from all sections of the plants entering into the Wastewater Treatment Plant. Out of these streams, some streams are acidic. The acidic effluent is neutralized by addition of caustic solution and the neutralized effluent is pumped to equalization tank.

Stream – I or TFE-I & II Plants (High fluoride & COD removal)

1. Collection Tank–A
2. Flash mixer with lime dosing system
3. High-rate solids contact clarifier –I with polymer dosing system
4. pH correction tank with acid dosing system
5. Collection tank–B
6. Multi grade filter
7. Fluoride removing resin column
8. Softener
9. Treated Water Sump

The facility is to collect and homogenize the effluent received from the TFE-I &TFE-II plants. Effluent from collection tank is pumped to flash mixer for mixing with Lime solution. This effluent is taken to high rate solids contact clarifier – I with polymer dosing system for clarification using effective coagulation &flocculation with help of coagulant/polymer dosing. The pH is adjusted in pH correction tank &then treated effluent is collected in collection tank –C. Then effluent is pumped to the multigrade filter-I &Fluoride Removal Resin Column for filtration &removal of the residual suspended solids &high fluoride content. After that effluent is passed through softener for hardness removal. The treatedeffluentiscollectedinholdingtank&transferredtoguardpond&finallydischargedtoGIDC.

Stream – II or WTP, H2 Bottling, TFE-I & II CT, CPP CTP, DI Plants (Low COD Stream)

1. Equalization Tank –A /B
2. High-rate solids contact clarifier –II with polymer dosing system.
3. Collection tank C
4. Multi grade filter

The purpose of Equalization tank - A / B is to facilitate collection of raw effluent from various processing plants such as WTP plant, ,Captive power plant (CPP) CT, common utility units etc. This effluent is taken to high-rate solids contact clarifier – II with polymer dosing system for clarification using effective coagulation &flocculation with help of coagulant/polymer dosing. This effluent is collected &settles in collection tank-C. The treated effluent from collection tank –C is pumped to the multigrade filter for filtration &removal of the residual solids. The clear effluent from the secondary clarifier overflows to the receiving guard pond & is discharged to GIDC.

Stream – III or CMS-I & TFE-I Plants (High BOD & COD removal)

1. Oil & grease traps
2. Collection cum neutralization tanks (2Nos.)
3. Flash mixer
4. Primary clarifier
5. Aeration tank
6. Secondary Clarifier
7. Sludge thickener
8. Centrifuge
9. Sludge Storage area
10. Guard Pond

Two equalization tanks are provided for collection of effluent from CMS-I & TFE-I plants. The effluent is thoroughly mixed till the required pH value is obtained. The neutralized effluent is pumped to flash mixer. The collected effluent is allowed to settle in primary clarifier. The gravity separation method separates the solid & liquids. Then it is effluent is collected in aeration tank &secondary treatment is done. The collected solid sludge is pumped to sludge thickener &liquid water is allowed to flow to guard pond. The concentrated sludge in sludge thickener is sent to centrifuge. The clear effluent is collected in guard pond & finally discharged to GIDC.

Stream – IV or CA, Flaker, Cl2 Bottling, CMS-II & Power Plants (SS removal)

1. Collection cum neutralization tanks (2Nos.)
2. Primary clarifier
3. Sludge thickener
4. Centrifuge
5. Sludge Storage area
6. Guard Pond

Two equalization tanks are provided for collection of effluent from various processing plants as mentioned above. The collected effluent is allowed to settle in primary clarifier. The gravity separation method separates the solid &liquids. The collected solid sludge is pumped to sludge thickener &liquid water is allowed to flow to guard pond. The concentrated sludge in sludge thickener is sent to centrifuge. The clear effluent is collected in guard pond &finally discharged to GIDC.

Stream – V or PTFE, PT-PTFE, DPTFE, & S&A Plants (High fluoride & SS removal)

1. Collection Tank
2. HRSCC-II with Polymer, FeCl3, Lime & HCl dosing system
3. Chlorine Contact Tank
4. Multi grade Filter
5. Activated Carbon Filter
6. Holding Tank
7. Decanter

The facility is to collect and homogenize the effluent received from the PTFE, PT-PTFE, DPTFE, & S&A plants. f These also facilitate collection of batch / intermittent / continuous flow of raw effluent and holding of some surplus amount. Effluent from collection tank is pumped and mixed with Lime solution &FeCL3 solution from dosing system this effluent is taken to high-rate solids contact clarifier – II with polymer dosing system for clarification using effective coagulation &flocculation with help of coagulant/polymer dosing. The provision of Chlorine contact tank is only for chlorination of effluent by adding solution of Sodium Hypo chloride. The treated effluent from collection tank –C is pumped to the multigrade filter &Activated Carbon Filter for filtration &removal of the residual suspended solids & organic suspended solid. The solid sludge is collected in sludge sump &pumped to decanter for dewatering. The centrate is taken in treatment process. The treated effluent is collected in holding tank &transferred to guard pond &finally discharged to GIDC.

Records of Past Incidents

- Because of good handling with hazardous substances and sound precautionary technique used, no major incident is recorded in the past.
- Details of the Major Incidents, Major Emergencies and Disasters happened in the facility are given in. **Annexure - 09 (Records of past incidents).**

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Chapter-3

Emergency Organization

Introduction

This chapter highlights the organization for emergency preparedness. No plan will succeed without effective emergency organization. Emergency organization is a part and parcel of a good On-Site and Off-Site emergency response management plan, without which all resources, facilities etc. even available with us, can not be put into services at a right time as time is the key factor in tackling an emergency. It is not possible to envisage and detail every action which should be taken in emergency and to harness the basic elements of emergency preparedness such as gravity of emergency, communication of information, On-Site action for process and emergency controls, mobilization of internal and external resources for fire and toxicity control, warning people at right time, Evacuation, Medical Preparedness, Pollution control etc.

Emergency organization is set up specifying duties and responsibilities of all to make best use of all resources and to avoid confusion while tackling the emergency. On-site Emergency Response Management Plan highlights the flow of information and co-relation among various action groups within the factory. Emergency organization and arrangements include:

- Site Main Controller
- Incident coordinator
- Deputy Incident Controller
- Emergency Response Team
- **Assembly Points**

Assembly Point No.	Location
1	New Admin Building
2	VIP Gate
3	Spent Methanol Tank North side
4	CMS-2 North Side Garden
5	CMS-2 Near north Side Garden
6	Limestone storage area north side
7	CaCl2 -4 Back east side contractor shed
8	Coal gate
9	CPP contractor shed
10	CCGT West side
11	TFE-3 South side
12	Cl2 Bottling east side near N2 tank
13	TFE-2 South side Transformer area
14	VDF substation West Side
15	Warehouse West side

- Emergency Control Center
- Fire &Toxicity control arrangements
- Medical Arrangements
- Transport Control Arrangements
- Pollution Control Arrangements
- Other Arrangements

1. The Emergency Response Team (ERT) will respond to any emergency at Gujarat Fluorochemicals Limited. Chart on next page (chart 1) shows the Emergency Response Team Organization (ERT). The roles & responsibilities of the individuals and the groups in the ERT and in the supporting groups are specified in next pages.

2. Communication among ERT members is primarily relied on wired telephone system. Other communication facilities such as the public address system, Walkie-Talkies, Intercom telephones, facsimile systems and electronic mail systems are also available.

3. ERT Team Members: **Detail is as Annexure No. –17**

Sr. No.	ERT Group	Quantity
1	Rescuer	250 Nos.
2	Fire Fighter	250 Nos.
3	First - Aider	100 Nos.

Emergency Alert Codes

4. For the purpose of determining the level of emergency response support required the following three emergency alert codes are used for the notification of emergencies:

Alert I Emergency

Any incident which is considered to be minor in nature and has no potential risk of threatening lives or facilities in the plant and it is within the capability of the ERT to conduct initial containment for spills, suppression of fires, or rescue operations for personnel shall be classified as Alert I emergency. Typical examples are:

- Minor fires involving plant equipment which can be extinguished easily
- Minor gas or toxic releases which can be isolated easily within a short period of time
- Minor building fires or fires involving non-process/plant equipment
- Minor hazardous material spills or releases from road tankers or storage tanks which can be contained by dike or absorbent materials or recovered by vacuum cleaner.

Alert II Emergency

Any incident which is considered to be serious in nature and, though it is still within the capability of the ERT to handle, has a potential risk of threatening other facilities or buildings on site or off-site shall be classified as Alert II emergency. Typical examples are:

1. Fires involving flammable storage tanks or plant equipment
2. Gas or toxic releases of relatively large quantity but can be isolated safely
3. Spillage of flammable or hazardous substances which requires substantial resources for Cleaning up or recovery

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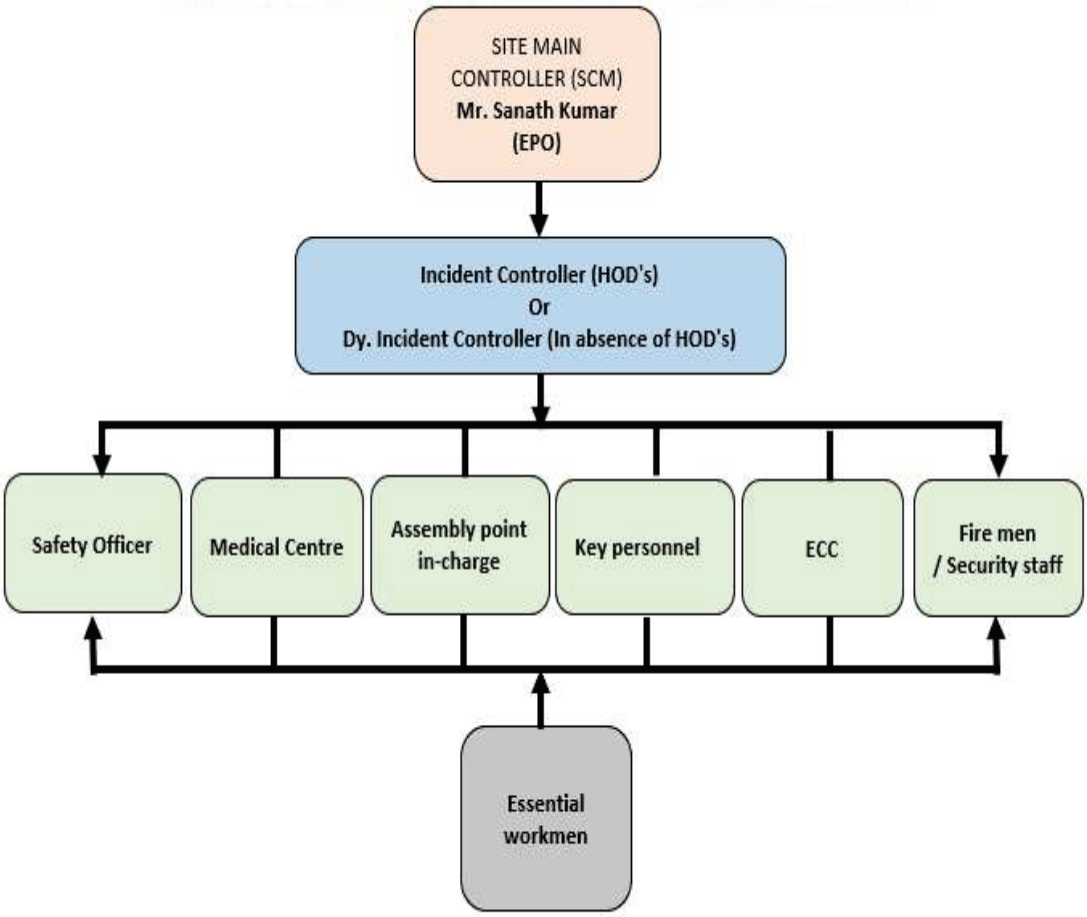
Alert III Emergency

Any incident considered being beyond the capability of the ERT to handle and it requires the assistance from external emergency agencies such as the Fire Service shall be classified as Alert III emergency. Typical examples of Alert III emergency are:

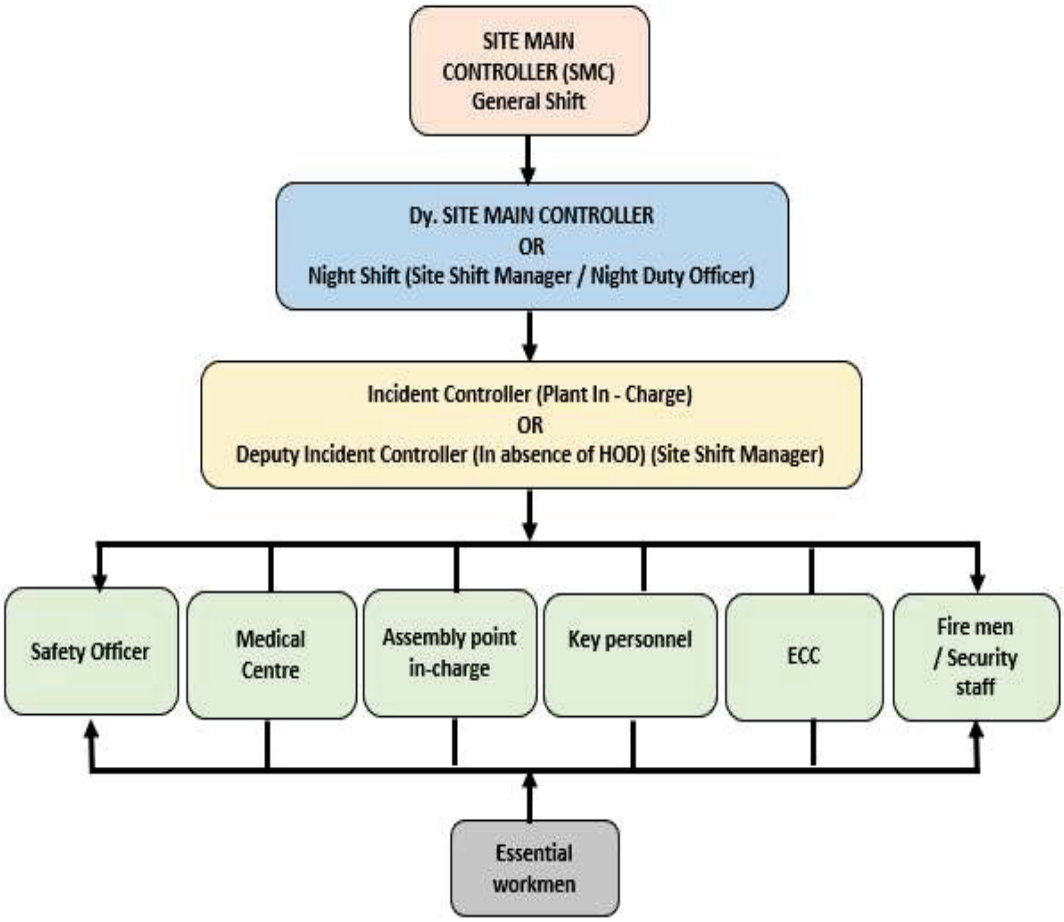
- Major and prolonged fires involving the plants or storage tanks.
- Major and prolonged gas or toxic releases due to catastrophic failure of process equipment or storage tanks which warrant a site-wide evacuation
- Major hazardous materials spills due to catastrophic failure of process equipment, storage tanks or road tankers.

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ON-SITE EMERGENCY RESPONSE & MANAGEMENT TEAM ORGANIZATION CHART



ON-SITE EMERGENCY RESPONSE & MANAGEMENT TEAM SUCCESSION ORGANIZATION CHART



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Key Personnel of the Emergency Response Management Plan Organization See

ANNEXURE – 14 & 15 - Incident Controller

ANNEXURE – 16 Site Man Controllers

ANNEXURE – 17 Key Personnel List &ERT Team Members ROLES&RESPONSIBILITIES

OF EMERGENCY RESPONSETEAM:

Detailed roles and responsibilities to be carried out by the On-Site Emergency Response Organization are tabulated,

ROLE	RESPONSIBILITY
Site Main Controller **Location** **Emergency Control Center**	Assisted by Incident Controller and other services Co-coordinators. Overall emergency coordination. Review and approve tactical plan. Communicate with Incident Co-coordinator and mobilize supporting groups. Call out and mobilize key personnel. Direct plant emergency actions (e.g. plant/equipment isolation plant shutdown, etc.). . Monitor personnel accounting status and activate rescue operations through Incident Coordinator if necessary. . Assess on/off-site impact and alert neighboring companies if necessary. . Decide on plant-wide evacuation if needed. . Continuous review and assess possible developments. . Control rehabilitation of affected areas and victims on cessation of emergency. . Announce All Clear message. • Site recovery and post incident critique.
Incident Controller **Primary Location** **Emergency Control Center**	Rush to the site and size up emergency situation and decide response strategy and tactical plan. Deputing Deputy Incident Controller on emergency site. Coordinating with Deputy Incident Controller. Organize emergency response team. Size up control zones Set up field Incident Post. Command and direct emergency response actions.

	Deploy emergency equipment. Direct rescue operations upon getting instruction from Site Main Controller. Communicate with Site Main Controller & update on incident status. Monitor safety of operations & decide to stop unsafe operations. Monitor personnel fatigue and stress Ensure decontamination is established Ensure that outside emergency services including mutual aid have been called in. Co-ordinate with external agencies after their arrival in case of emergency. Inform the emergency team leaders about the situation.
Deputy Incident Controller **Primary Location** **Emergency Site**	Direct all operations within the affected area with the priority of, - Secure the safety of personnel - Minimize the damage to plant, property and environment. - Minimize the loss of material. Decide whether on-site emergency action plan is to be initiated depending upon the process control and severity of the incident. Direct rescue, spill control, firefighting team leaders. Monitor the incident as a whole. Ensure that emergency control center / security supervisor and complementary communicating officer are informed. Evacuate non-essential persons to assembly point. Appraise ECC about the developments of emergency control continuously by personal approach or messenger or telephone. Search for the casualties using PPE. Appraise the situation to a senior officer whoever reaches first at site. Preserve evidences that will be necessary for subsequent inquiry into the cause of emergency and concluding preventive measures. Remark: Plants are running in three shifts and shift in charges is available round the clock in each shift. As shift in charge is having thorough knowledge of the plant and has capability to take decisions both for processes and incident control, he will be Dy. Incident controller in absence of HOD

Duties of N.D.O. **Location Emergency Control Center**	.Assisted by Incident Controller and other services Co-coordinators. .Overall emergency coordination in absence of Site Main Controller. . Communication with SMC regarding emergency.
Duties of HSE Staff **Primary Location: Incident Site**	Take instructions from the site main controller. Liaison with Hospital to handle emergency cases related to Injury and Illness. Assist the Site Main Controller to alert and co-ordinate with external emergency organizations. Assist the Site Main Controller to make announcement. Call out key personnel. Assist in handling in-coming phone calls, queries from external agencies and employee family. Ensure communication aids are provided for effective communication at ECC. Evaluate the spill. Mobilize all necessary and suitable spill control equipment. Take instructions from the Site main controller. Assign spill control responders. Provide direction for spill control responders Suitably rotate spill control responders to avoid fatigue Monitor and maintain essential supplies to the incident site. Perform spill control activities. Coordinate with first aid / firefighting team if required Check the conditions of the PPE provided for spill Control. Inform about the situation to incident coordinator. Suitably dispose all contaminated items after spill control.

Medical Care / First Aid Coordinator (Medical Centre) **Primary Location: Incident Site**	After hearing the siren two people will bring stretcher & medical oxygen kit to incident place. Arrange for additional oxygen sets / cylinders required from neighboring factories. Get ready with the list of blood group donors and arrange to send the donors if required. It shall be ensured that telephone traffic is controlled. Arrange for refreshment/ food for the personnel engaged in the emergency action. Get the relevant data of the victims and inform their relatives. Inform nearly by Hospital / medical institutions about the required help. Provide support for first aid and rescue operations. Update the Site Main Controller on the first aid operations. Monitor and assist the incident first aid center and the medical center.
Duties of Assembly Point In-Charge	Shall evacuate the area and report to a specified assembly point. Assembly point in-charge will be any of Key Personal or in his absent available senior most personal takes this responsibility. At reaching the designated Assembly points after considering the wind direction, the workers and the staff must be instructed to queue according to the plant and the department they belong to. Each section senior person must then count the heads and match with their daily attendance record to see if anyone is left missing in the plant. If so then the fire and rescue personnel must be informed accordingly with his most probable place of being.
Duties of Key Personnel	On receipt of emergency message/siren departmental in-charge shall arrange to spare and ensure to send personnel trained in Fire Fighting, First Aid and Rescue for emergency activity at incident place. Departmental in-charge arranges to vacate the shop floor or work place keeping necessary employees to operate continuous process and evacuated personal should assemble at the assembly point. The individual concern shall leave the work place as safe as possible like switching of welding machines, gas cylinders, electrical light or appliances in their room. Proactively takes charge of various activities (fire and safety, gas spill control, communication, medical services, transport, engineering and technical help, utilities and outside help) being carried out at the time of emergency.

	Co-ordinate and ensure the activities related to perform show (at incident control, assembly point, Emergency control, communication, security main gate) appropriately. Direct and help securities to handle crowed/mass with proper discipline.
Duties of Non - Emergency Personnel	Do not get panic. Act accordingly to the prevailing situation. Check the wind direction and decide the escape route if it is required to do so. Do not approach the scene of accident as a spectator. Do not engage phone unnecessarily somebody may be trying to pass on some information. Non-operations employee shall approach assembly points after receiving instructions. Visitors shall move out of the factory on hearing the siren.
Duties of Security Staff	Keep main gate closed till all clear siren and normalcy is restored. Do not allow any vehicle or tanker inside the factory, except essential vehicles such as fire tenders/ foam tender, Ambulance, Govt. Agencies, Statutory Authorities, Mutual - Aid staff, Ambulance etc. In case of toxic gas release send two watch guards to alert the neighboring factories depending upon wind direction. Check about public in vicinity and ask them to evacuate on upwind at a safe place. Help fire squad team to evacuate non-essential personnel and non-technical staff. Depute security guards to control traffic on the internal road. Depute security guards to help firefighting, if necessary. Lead the external helping teams to reach the accident site. Do not engage phone unnecessarily somebody may be trying to pass on some information. Control the crowd Cordon off the affected site
Duties of Essential Staff	Firefighting, gas leak and spill control till Fire Brigade takes the charge. To help to the Fire Brigade and mutual aid teams, if it is so required. Shutting down plant and making it safe. Emergency engineering work e.g. isolating equipment, materials, process, providing temporary by-pass lines, safe transfer of material, urgent repairing or replacement, electrical work etc.

	Provision of emergency power, water, lighting, instruments, equipment, material etc. Movement of equipment, special vehicle and transport to or from the scene of the incident. First-aid and medical help. Moving tankers or other vehicles from areas of risk. Carrying out atmospheric test and pollution control. Manning of assembly points to record the arrival or evacuated personnel. Manning for outside shelters and welfare of evacuated persons there. To look after the rehabilitation of affected persons after withdrawal of emergency at the site. Assistance at casualties' reception areas to record details of casualties. Assistance at communication centers to handle outgoing and incoming calls and to act as messengers if necessary. Manning of works entrances in liaison with the police to direct emergency vehicles entering the work, to control traffic leaving the works and to turn away or make alternative safe arrangements for visitors, contractors and other traffic arriving at the works. Informing surrounding factories and the public as directed by the Site Main Controller.

Coordination Instructions

Personal Emergency Contact Numbers

The contact numbers (telephone and mobile) of the key personnel who will provide support and back- up services and assistance to the On-Site Emergency Response Management Team are listed at various locations such as the Security Cabin & Admin Buildings.

Details of Fire Fighting & Life Saving Equipments as per – Annexure – 20

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Procedure for Emergency Call-Out of Key Personnel
(After Office Hours)

The Shift In charge shall call the respective Incident coordinator and provide the following information and record the same and incident coordinator shall call to Site Main Controller.

(i) What happened (e.g., fire, spillage, explosion, etc.)
(j) Time and location of incident
(k) Alert level

On receiving the information from the fire alarm, Trained Security personnel shall rush to the incident location to help the Shift In charge in handling the emergency. If the Unit Head is not available, the Shift In charge will call the respective Incident Co-coordinator at his home phone number. Upon receipt of such emergency calls, the key personnel shall call out their respective team members who need to render assistance in the emergency in the same manner. The Site Main Controller, safety officer and incident coordinator shall depart immediately to the site depending on the alert level of emergency.

Important Note

Till the Site Main Controller or his designate reach, the site during an after office hours Emergency, the respective HOD shall act as a Site main controller and take decisions regarding the external agency call-out and on handling the emergency

If the key personnel, especially the Functional heads are outstation or out of the country where they cannot be reached by mobile phone they shall delegate their responsibility to their resources or members.

Recognition of Problem

- The first action in case of a chemical spill, and critical to subsequent actions, is early, accurate identification of what is being spilled, the extent of the spillage, the expected duration and potential for the incident to worsen. This can sometimes be determined quickly. Other incidents may require some investigation time. Activate alarm through phone call to security to alert the emergency response team.
- A quick "size-up" is required if effective notification, and possible evacuation of employees or contractors are needed. Attempt to stop leak only if personal safety is not endangered stop all work in the vicinity and ensure no source of ignition. Evacuate all workers to up-wind location.
- If in your best judgment, based on the initial known factors, there is potential to cause harm to anybody, you should alert them as quickly as possible. To delay this action greatly increases the level of possible harmful results.
- Generally, if you feel the leak can be controlled in a short time (30 minutes or less) you should advise them of the situation. If you feel the leakage will continue for longer than that and the spilled material is very toxic or highly corrosive you should advise immediate but orderly evac

Safety of Personnel

- The first concern in the event of any spillage must always be the safety of people, both employees and our contractors.
- All must be accounted for as quickly as possible. If anybody is missing, organize search and rescue operation with the instruction of the emergency Incident Controller.
- Personnel who are not needed to cope with the problem should be removed from the emergency area to an area of safety as quickly as possible.
- Persons remaining in the spill area must wear the appropriate level of personal protective equipment (PPE) to protect them from exposure to the chemical involved before attempting any emergency action.

- This PPE would include either a self-contained breathing apparatus (SCBA) or an airline respirator with an emergency egress unit. Body protection would depend on the chemical involved with reference to the MSDS.

- Traffic control and barricade off accessible roads.

Standard Procedure for Evacuation

A plant emergency may require various evacuation steps by employees. Depending on the seriousness of the emergency or by specific instruction, employees must be prepared to evacuate:

Various kinds of emergencies that can warrant limited or total plant area evacuation are:

- Severe fire
- Severe toxic-flammable gas release
- Threatening calls, civil unrest or curfew
- Earthquake, flood, storm

The Site Main Controller / Coordinator shall use his judgment and discretion to decide, and as far as reasonably practicable consult with the Management Leaderships, to effect a partial or total evacuation of personnel from the site.

- Some spillage could be serious enough to either evacuate the affected area and possibly site or have them take shelter in safe places until the spillage passes.
- Evacuation of employees and contractors should be initiated by fire alarm and then advising appropriately, specific evacuation information and instructions. Evacuation routine shall be cross-wind and up-wind relative to the gas cloud near assembly point.
- This Four Gates (VIP gate, Material gate, Labor gate and coal gate) are identified as emergency evacuation gates. So, in case of emergency use these gates according to wind direction. In plant for wind direction various wind sock available for check wind direction.

Evacuation classification:

Stage I

- On hearing the siren, respective area team will make quick check for any abnormality and verify the affected zone.
- On verification Shift In charge/ Incident Coordinator shall decide further course of action. If the fire is small and in Alert level 1, then the Shift In charge/ Incident Coordinator will engage the Fire Fighting team to put off fire and need not evacuate all the people.

Stage II Evacuation

- On hearing the siren, respective area Shift In charge/ Incident Coordinator shall verify the affected area. If the fire stage is evaluated as Alert II, then the Shift In charge/ Incident Coordinator shall retain Fire Fighting team and First aid team at incident location and evacuate rest of the people to the assembly point.

Stage III Evacuation

- On hearing the siren, respective area Shift In charge/ Incident Coordinator shall verify the affected area. If the fire stage is evaluated as Alert III level, then the Shift In charge/ Incident Coordinator shall take instruction from Site Main Controller to do further firefighting or to evacuate the incident location.

- Plant evacuation will take time to execute. If there is adequate warning time, normal Shutdown procedures will be used as outlined in the Operations Manual.
- Orderly evacuation steps may then take place. When time is limited, crash-type Shutdown procedures will be used. Information to evacuate will be passed down through supervision to all personnel in the plant.

Assembly Points and Evacuation Routes

- There are total 15 Assembly points as below mentioned locations.

Assembly Point No.	Location
1	New Admin Building
2	VIP Gate
3	Spent Methanol Tank North side
4	CMS-2 North Side Garden
5	CMS-2 Near north Side Garden
6	Limestone storage area north side
7	CaCl2 -4 Back east side contractor shed
8	Coal gate
9	CPP contractor shed
10	CCGT West side
11	TFE-3 South side
12	Cl2 Bottling east side near N2 tank
13	TFE-2 South side Transformer area
14	VDF substation West Side
15	Warehouse West side

- These are the locations where all personnel on site will assemble in case of an emergency and the head count will be conducted by the security supervisor at all mentioned four gates.

The Incident Coordinator and the Designated Rescuers

Respond to the scene of the release or incident and communicate with the Operation Team of the affected area. Determine the needs of the area, which could include searching, rescue and transporting of victims to areas where medical assistance is available. Determine extent of release. Develop a plan of action with the Site main controller and review plan with Operations Heads.

(1) Determine scope of search

- Decide whether search is needed.
- Decide on size of area to search(downwind)
- Do not search unoccupied or locked buildings unless someone is believed to be inside.

(2) Consider resources available.

- Extra manpower available
- Vehicles available for transportation

- Extra safety equipment available

(3) Determine use of manpower and protective gear worn

- Minimum of two persons per team
- Donned proper protective gear.
- Ambulance and First Aider on standby

(4) Execute plan - revise plan as needed.

Emergency Control Center (ECC)

The Emergency Control Centre (or Room) is the place from which the operations to handle the emergency are directed and coordinated. It will be attended by the Site Main Controller, key personnel and Senior Officers of the Fire, Police, Dy. Director – Industrial Safety and Health, District Authorities and Emergency Services. The Centre should be equipped to receive and transmit information and directions from and to the incident controller and areas of the works as well as outside. It should also have Equipment for logging the development of the incident to assist the controllers to determine any necessary action.

In addition to the means of communication, the center should be equipped with relevant data and equipment which will assist those manning the center to be conversant with the developing situation and enable them to plan accordingly. It should be sited in an area of minimum risk and close to a road to allow for ready access by a radio-equipped vehicle for use if other systems fail or extra communication facilities are needed.

For large sites, or where toxic releases might be anticipated, consideration should be given to setting up two control centers to ensure, so far as is possible, that one will be available for use, should the other be disabled. If necessary, the police will assist to set up an Emergency Control Centre remote from the works.

The center should therefore contain:

An adequate number of external telephones. It is strongly recommended that at least one should be ex- directory or capable of use for outgoing calls only. This will avoid the telephone switchboard being overloaded with calls from anxious relatives, the press etc. The latest telephone directories with a separate list of important numbers.

1. An adequate number of internal telephones.
2. Radio equipment, hot lines, and Walkie -Talky.
3. Plans of the factory to show:

a) Areas of large inventories of hazardous materials including tanks, reactors drums and compressed gas cylinders
b) Location of radioactive sources.
c) Sources of sirens and safety equipment including fire, explosion, spill and gas controls.
d) Stocks of other fire extinguishing materials.
e) The fire-water system and additional sources of water.
f) Site entrances and road system, updated at the time of the emergency to indicate any road that is impassable.
g) Assembly points, shelters, lunchroom and canteen.
h) Casualty treatment Centre's, first aid centers and ambulance
i) Parking points, rail sidings and visitor's room.
j) Location of the factory in relation to the surrounding community.

Site main controller will operate from ECC, details regarding ECC is given in

Annexure -20 (Emergency Control Center)

Items available in emergency control center

- SCBA (Self Contained Breathing Apparatus)
- PPEs (Safety Helmet, Hand Gloves, Body Apron, Safety Shoe, Glasses, Face Shield, Chemical Suits etc.)

- Telephone connections (2Nos.)
- Emergency Torch
- Drawings
- Fire Extinguisher Details
- Plant Layout
- Copy of updated Organization Chart
- Copy of onsite emergency response plan
- Walkie Talky set

About medical arrangements:

- The Occupational Health Centre (OHC) with all the required facilities with two nos. of Ambulances are available at OHC which runs round the clock. Qualified Medical Officer and 4 Male Nurses are available at OHC.
- Following Equipments are available at OHC.
  - Central Oxygen Line
  - Separate Oxygen Cylinders
  - ECG Machine
  - PFT Machine
  - Audiometry Machine
  - Vision Test
  - Suction Machine

Accounting for Personnel /Head count

It is necessary to know that everyone on – Site has been accounted for and that the relatives of casualties if any have been appropriately informed. Holidays and sickness absence will have to be taken into account and adequate personnel for relief are made available including replacement for some others who may be at off- site at time engaged on other work. Records of the employee (normal roll present on a particular day or shift can be known from timekeeper office. Officers' presence can be known in departments. Shift schedules are also maintained in the department and in time office for each person.

Shift change time will create confusion. In such case to record will help depending on outgoing or incoming punches. Records of arrival and departure of all visitors is maintained by the security department together will the names of persons/ officers of the company to whom they have come to meet. etc. In charge of assembly point will record the names & department of people reporting at assembly point. A responsible person will collect the list to compare them against the normal roll or list of those believed to be on-site inform the police of any believed to the missing. IC will be informed and arrangement will be made for further search. Visitors should be accompanied by responsible members of the works staff. Designated to perform emergency duty. Display proper board for storage area.

In the immediately affected area Incident controller etc. will arrange for a search to locate any injured persons or casualties. Other workers/colleagues also will give information regarding the same. Head count at the respective assembly point shall be tallied by Head count coordinator and communicate to Communicator Wait for further instructions from the Emergency Response Incident Commander or Communicator. Any person who is not accounted for will be located by the Officer (H.R. & Safety) on instruction from Communicator and the rescue team will carry out search and rescue operations to locate the missing person or persons upon the instructions of the Incident Commander.

Public relations:

Inevitably a major incident will attract the attention of the press, television and radio services and anxious inquiries from friend and relatives will be flooding the factory. It is essential to make arrangements for authoritative release of information to them.

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Declaration of Cessation of Emergency

The security officer or guard will not signal the end of the emergency until that all the spillage / leakage are arrested or fires are extinguished and there is no risk of re-ignition in case of fire, in case of gas, the all clear will be declared only when the source of emission has been effectively isolated and gas clouds dispersed well above safe level. Even when the all clear signal has been given , great care is needed while entering affected areas and no work in connection with salvage , collection of evidence should be commenced until a thorough examination of the area has been carried out. The siren code will follow for declaring the cessation of an emergency. Source of leakage spillage or re-ignition such as diesel engines, hand or power operated tools, flame cutting equipment and so on until it has been established that no flammable materials remain where they could be ignited. All clear shall be given by Site Main Controller.

Traffic control:

The security in-charges or guard shall contact Site in charge and shall make himself available at main gate for traffic control till local authorities help is available. In case of diverting the traffic of nearby roads or stoppage, security guard shall co-ordinate with site in charge with outside agencies as police, ADM etc. Unwanted traffic and public gathering shall be controlled & avoided by security personnel till local help from police is available.

Annexure - 25 Local Crisis Group

Types of Accident: Major accidents, which may require outside help, are follows:

1. Leak / Spillage Of

- Solvents, Chemicals, Fuel Oil, etc. release

2. Bursting at:

- Process area
- Storage Area

3. Fire or Explosion at:
- Reactors
- Storage Tanks
- Utilities
- Transformers /Substations

4. Natural Calamity /War

In case of natural calamity like flood, storms, or earthquake (remote possibility) or war like situations the management may seek outside help. The help may be for firefighting, evacuation (of surrounding population), medical treatment, shelter, transport or communications. The responsibilities of outside organizations will be rendering services as follows during emergency to provide,

- Food
- Help in evacuation of the surrounding area
- Communications
- Firefighting
- Shelter
- Medical services
- Transport

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Chapter-4
Communication System

About Communication System

Effective and immediate communication of the emergency is the vital element in the process of emergency preparedness. It helps to mobilize the resources in the shortest possible time and attack on the emergency at its incipient stage. The communication system with regards to raising the alarm, declaring the major emergency and procedure to make it known to others is explained here.

1. Alarm system: Company having electrically operated siren to warn person which is placed in different plants building.
2. Telephones: Company having landline phone as well as mobile phone for immediate communication.
3. Walky-Talky & PA System: Company having Walky-Talky system and Personal Address System for internal communication. And In emergency all plant come in common channel-10 of fire for emergency.
4. Emails: Company having E-Mail facility for immediate detailed reporting.

Raising the Alarm Making the Emergency Known

All the plants/ departments are provided with internal telephones. Plant helper/ operator of a plant, while working in plant / taking round of the plant, can easily notice an unwanted incident that might occur. He shall immediately communicate the same to other helpers/ operators as well as message will be passed on to shift officer. Any one of them will blow siren as per instruction of site main controller. Plant manager / etc. will be informed immediately. Fire and safety key personnel and other key personnel will also be informed at the earliest.

Siren

When the area of plant site and the number of installations is more, siren has to be installed for general communication to media. It can be used for declaring the on-site as well as off-site emergency. And making the major emergency known to the people. Siren not only communicates the emergency to the plant personnel but also to the surrounding areas of the factory.

Declaration of Major Emergency and Emergency Alert Codes

The declaration of major emergency puts many agencies on actions and the consequences may be serious, therefore such declaration should not be decided on whims or immature judgment or without proper thoughts. Because of the scale of activity which will be activated after the declaration of a major emergency, it is advisable to restrict the authority to declare it. In Gujarat Fluorochemicals Limited, Site Main Controller shall declare major emergency. For the purpose of determining the level of emergency response support required the following three emergency alert codes are used for the notification of emergencies:

Alert I Emergency

Any incident which is considered to be minor in nature and has no potential risk of threatening lives or facilities in the plant and it is within the capability of the ERT to conduct initial containment for spills, suppression of fires, or rescue operations for personnel shall be classified as Alert I emergency. Typical examples are:

- Minor fires involving plant equipment which can be extinguished easily.
- Minor gas or toxic releases which can be isolated easily within a short period of time.
- Minor building fires or fires involving non-process/plant equipment.
- Minor hazardous material spills or releases from road tankers or storage tanks which can be contained by dike or absorbent materials or recovered by vacuum cleaner.

Alert II Emergency

Any incident which is considered to be serious in nature and, though it is still within the capability of the ERT to handle, has a potential risk of threatening other facilities or buildings on site or off-site shall be classified as Alert II emergency. Typical examples are:

- Fires involving flammable storage tanks or plant equipment
- Gas or toxic releases of relatively large quantity but can be isolated safely
- Spillage of flammable or hazardous substances which requires substantial resources for cleaning up or recovery

Alert III Emergency

Any incident considered being beyond the capability of the ERT to handle and it requires the assistance from external emergency agencies such as the Fire Service shall be classified as Alert III emergency. Typical examples of Alert III emergency are:

- Major and prolonged fires involving the plants or storage tanks.
- Major and prolonged gas or toxic releases due to catastrophic failure of process equipment or storage tanks which warrant a site-wide evacuation
- Major hazardous materials spills due to catastrophic failure of process equipment, storage tanks or road tankers.

Telephone Messages

All plants i.e. electrical substation, maintenance department, process area, etc. and all emergency services all offices / units / departments are connected with internal telephones network, public address system and warlike- Talkies which act as an easy and immediate means of communication. After emergency declaration or even while just receiving the emergency message on phone, a Fire control room operator has to play an important role. He should be precise, sharp, attentive and quick in receiving and noting the message and then for immediate subsequent action for further communication. Once emergency declared all Walkie – talky channel will set on HSE Channel no. 10.

Site Shift Manage (SSM) role as communication officer and help to Incident controller during emergency for communication with senior management, plant HOD, Fire Crew, Security and ERT.

Sr. No.	Communication	During Gen Shift Hrs.	During Silent Hour
01	Internal Communication	Concerned Plant	Concerned Plant
02	Neighboring Factories & Public in vicinity	Security	Security
03	Key Personnel	Emergency Control Room	Shift officer / Supervisor/Control Room
04	Outside emergency services and authorities	Emergency Control Room Operator	Shift officer / Supervisor/Control Room

- Location of **Alarm & Siren** is given in **Annexure -23**
- All-important **internal & external telephone** nos. are given in **Annexure - 24 &25**
- List of **walky-talky sets** are given in **Annexure -24**

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- **External Telephone Communication Metrix**

Sr. No.	Name	Designation	Telephone (O)	Telephone (M)
1	Deputy Collector	SDM Bharuch	2642241980	9978405256
2	Mamlatdar Vagra	Mamlatdar	2641225221	7574817007
3	Officer (IS&H) Bharuch	Factory Inspecter	2642240421	9099046683, 9428164488
4	GPCB Bharuch RO	Regional Officer	(02642) 246333, 248665	9825645297
5	Police Sub Inspector	Police Station, Dahej	2641256233	9825213405
6	Taluka Dev. Officer Vagra	Divisional officer	2641225223/225697	7567012640
7	Police Inspector	GIDC, Ankleshwar	2646225551	9408303240
8	Medical Officer, MBBS	Community Health Centre, Vagra	2641225243	9427444428
9	Press Reporter, Bharuch	Press Reporter, Bharuch	---	9879553471 / 8140184149
10	NGO, Ambheta	NGO, Ambheta	---	8200248541
11	Village Representative, Dahej	Leader, Dahej	---	9427874566
12	Village Representative, Ambheta	Leader, Ambheta	---	9879563990

- **Internal Telephone Communication Metrix**

Sr. No.	Name	Designation	Telephone (O)	Telephone (M)
1	Mr. Sanath Kumar	Site Head	02641618009	9724176011
2	Mr. Jignesh Parmar	Dy. Site Head	02641618444	9998213810
3	Dr. Sharad Potghan	HSEF Head	02641618090	7201000199
4	Dr. Sunil Bhatt	HR Head	02641618005	9099941862
5	Mr. Rajiv Sharma	Commercial Head	02641618013	8155911124
6	Plant HOD's	Plant HOD	Telephone Directory	Contact Detail at ECC
7	Fire Station	Emergency Services	02641618084	9081066613
8	OHC	Emergency Services	02641618088	9714178885
9	Security	Emergency Services	02641618086	7359607700
10	ERT member	ERT	Contact Detail at ECC	Contact Detail at ECC
11	Mutual Aid member	Mutual aid	Contact Detail at ECC	Contact Detail at ECC

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Chapter-5
Action on Site (Information on Preliminary Hazard Analysis)

Gujarat Fluorochemicals Limited has planned following three stage activities as they are co-related: provide better points for emergency preparedness and emergency actions with subsequent follow-up:

- Pre- Emergency Activity
- Emergency time Activity
- Past Emergency Activity

To take care for Pre-Emergency activity the care should be taken for the following important aspects,

- Internal Safety Survey
- Pressure vessel testing
- protective equipment
- communications
- Medical facilities

Following types of Hazards exists in the factory as:

- Storage hazards (Chemicals)
- Materials handling (Drums)
- Operating Hazards (Process)
- External Hazards

Definitions:

Hazard:
A hazard is a physical situation which may cause human injury, damage to property or the environment or some combination of these criteria.

Risk:
Risk is likelihood of an undesired event i.e., accident, injury or death occurring within a specified period or under specified circumstances. It may either a frequency or a probability depending on the circumstances. Source of Potential Harm or a situation with a potential for harm.

Fire Hazards:
Fire hazards exist in following areas & the same is indicated in the site plan.

1. Reactors
2. Transformers
3. Panels (Electrical)
4. Raw material and Finished Product storage area.

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Leakage or Spillage of Chemicals

This area is focused on chemicals as per below given table. Special instructions for storing handling & emergency actions in case of release of toxic are given separately in MSDS (Material Safety Data Sheet)

Sr. No.	Name of the hazardous Chemical (mention concentration if any)	UOM	Quantity Maximum storage capacity	Actual stored (including in process handling)
1	Liquid Chlorine	M3	315 (105X 3)	179
2	Methanol	MT	250 (50X2 +150)	213
3	Sulphuric acid (98%)	MT	608 (100m3 X3 Tanks, 30.5m3)	517
4	Sulphuric acid (88%)	MT	360 (100 m3 X 2 Tanks)	306
5	Hydrochloric acid (31%)	MT	260 (50m3 X 04) (26m3)	221
6	Methylene Dichloride	MT	375 (150m3 X 2) (75m3 X 1)	319
7	Chloroform	MT	237 (100m3& 60 m3)	201
8	Carbon Tetrachloride (CTC)	MT	268 (100m3 & 75m3)	228
9	Natural Gas (NG)	SCM/D	190000, 2.45 bar, 30-40 ^{0}C	NA
10	Coal	MT	15000	13500
11	Hydrogen Gas	Nm3/D	100000	NA
12	Caustic Lye (32%)	MT	310 (117.5m3 X 2	264
13	Caustic Lye (48%)	MT	3576 (400m3 X 3, 1200m3)	3040
14	Anhydrous Hydrofluoric Acid (AHF)	MT	18.07	18
15	Dilute Hydrofluoric Acid (20% DHF)	MT	80	68
16	Flurosilicic Acid (H2SiF6 30%)	MT	100	85
17	Vinylidene Fluoride (VDF)	m3	39	39
18	Oleum	KL	200 (100 X 2 No.)	170
19	R-142-B	KL	79	79

Hazard Identification and Risk Summary

Major Hazard: A brief description of the possible hazards at M/s. Gujarat Fluorochemicals Limited in handling hazardous chemicals is given in this section.

Fire and Explosion of

- Reactors
- Compressor
- Utilities
- Transformers
- Tanks

Safety and mitigation measures:

General Safety Considerations

1. Adherence to international engineering standards in the design, construction and testing of the storage tanks, equipments and other hard wares.
2. Statutory approvals of hazardous storage, waste treatment and disposal stack emission etc.
3. Storage tanks containing hazards material are located away from the main plant.
4. Identified various hazards in plant area and are keeping a sharp and alert watch on various likely emergency spots.
5. Protective equipments are regularly checked and kept easily accessible and easily workable during emergency.
6. Other personnel protective equipments are also kept ready, duly tested at a regular interval.
7. Procedure of safe shut down and isolation.
8. Action to be taken if emergency arises from any toxic chemicals leakage, fire, explosion, collapsing of structure or equipment etc.
9. Time to time they are feed with the knowledge of safety measures and controls.
10. List of emergency tools, fire fighting procedure.
11. Workers are given practical training for the fire fighting regularly by an expert organization.
12. use of personal protective equipment

Equipment and Storage Safety

1. Safe work systems in place like permit to work system.
2. Various permits for different jobs like (Hot work, Vessel entry & Confined Space, Tanker unloading, Working at height etc.)
3. All storage tanks are located in the dykes with flame arrestor and breather valve.
4. spillage and leaks from the storage tanks can be collected and transferred out and treated for safe disposal
5. Floor washing is collected and treated in effluent treatment plant.
6. the hazardous equipments are provided with seal arrangement which will prevent leak
7. safety valves , rupture disk is provided to the high hazardous reactors

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Mock Drill & Training

Training schedule for all employees and contractors' personnel.

Type of Training	Training Contents
Basic Emergency Response Training	On-Site ER training Basic First aid training (one day course) Basic Fire Fighting Training (one day course) Handling hazardous chemicals
Advanced Emergency Response Training	Spill Control Training Communication Training Tabletop Exercises of Emergency Scenarios. Planned Mock Drills Surprise Mock Drills After office hours planned & surprise mock drills Advanced Fire Fighting, Rescue and First-Aid Training

- All employees should know the details of emergency response management plan and they must receive initial training in emergency procedures. Then suitable intervals this knowledge must be exercised and the basic plan reviewed and brought up to date.
- It is essential to establish the necessary confident volunteers and better expertise, so that individual can carry out their allocated duties.
- Rehearsal of Mock Drill should be regularly carried out effectively and should cause minimum disruption to the normal activity.
- Mock drills is conducted six monthly.
- An after mock drill report may be prepared detailing the lacunas & strong points so as to make improvements in the emergency action plan.
- All ERT members are required to attend the following basic and advanced emergency response training

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About Fire System

- The plant is equipped with a comprehensive fire protection system, following facilities have been provided for the fire protection:
- To met and control the emergency and to minimize the dangerous consequences, ready to use tools and equipments are essential. A list of firefighting equipments is prepared and their location is indicated in the list.
- All buildings and process areas are provided with hand-held fire extinguishers. Depending on the type of hazards, Foam type, CO2 or Dry Chemical (for ABC fires) are installed and spaced in accordance with the regulatory requirements

A list of details about portable extinguishers is attached in **Annexure: 20**

Details of Fire Fighting & Lifesaving Equipments & Fire Hydrant Network Drawing.

Fire Suppression and Control

Most site employees receive training on basic firefighting. Any employee is capable of extinguish a small fire. Larger fires will require coordinated effort centered around the specially trained Emergency Response Team on

each shift. Due to our remote location from outside assistance, our response plan is premised on handling our own firefighting. Immediate action for quick fire fighting

1. Think! Can I extinguish the fire? Do I need help?
2. If fire is in incipient stage, use hand held fire extinguisher, hose reel or fire monitor to extinguish fire.
3. If fire is too large - get help! Activate fire alarm and report the location of the fire. If you know, give wind direction
4. Stop all work in the area. Secure all ignition sources in the area.
5. Emergency Response Team report to staging area upwind of incident and don PPE and receive instruction from Incident Coordinator. Account for all personnel.
6. Site Main Controller /Emergency Incident Coordinator and Emergency Response Team determine course of action.
7. Site Manager sets up communications center at Emergency Control Center to contact Key personnel, additional resources, and external agencies as necessary.
8. Uninvolved employees report to one of the assembly points. Do not enter the site of the emergency unless you have a specific emergency assignment there.

Site Main Controller

The Site Main Controller will have the responsibility for directing the emergency until the emergency is brought under control. He will be responsible for manning the command post and coordinating all site activities which could impact upon the control of the emergency. He will work with the Incident Coordinator to develop a plan of action and will direct him in whatever duties are required. He will be responsible for directing the emergency response team in all firefighting in the field. He must also be kept advised on all operations at the unit that might affect fire control or endanger personnel.

Incident Controller

The Incident Coordinator will take charge of the Incident site and instruct Fire team & first aid team and maintain two-way communications with Emergency Control Centers and report to the Site main controller.

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List of Rescue / Safety Equipment (Respiratory & Non-Respiratory)

- Safety Helmet
- Safety Hand Gloves
- Safet0y Goggles
- Face shields & gumboots.
- SCBA (Self Contained Breathing Apparatus)
- Respirators

System Elements or Events That Can Lead to a Major Accident

Control of Spillage

- Efforts must be undertaken where safely possible to minimize the effect of the spillage until it can be secured.
- If the spill is creating a vapor cloud, and the material is water soluble, a water fog curtain can dramatically reduce the concentration of escaping vapor.
- Even water reactive materials can be handled this way in some cases by keeping the water fog curtain away from direct contact with the spill area.
- If the spill is liquid, run-off of the spill and/or any applied water can be confined by closing isolation valves in the drain age systems.
- Once the spillage is controlled and the emergency is over, clean up and recovery can then be handled by vacuum cleaners, excavation, absorbent, drumming, etc.
- Spills of volatile liquid materials may be successfully controlled by the application of stabilized foam.
- The gelled foam blanket will effectively suppress vapor release from many spills for periods of several hours to several days. The gel can be penetrated and a suction hose used to remove the liquid beneath it.
- In some cases of airborne dust, a properly applied water fog curtain downwind can also provide an effective barrier.
- In all cases, any action that can be safely attempted by properly protected personnel to reduce or terminate the chemical release will be carried out.
- As in all emergencies, communication, clearly understood responsibilities and roles, and an action plan are all critical to a safe, effective response.

Clean-Up

- Following any accidental release, all spilled materials will be recovered and disposed of safely in accordance with established regulatory permits, standards and proper practices.
- All contaminated items will be either thoroughly decontaminated or properly disposed off by incineration. Contaminated clothing should also be incinerated.

Spill Emergency Reporting

- Location
- Name of Material (Spilled)
- Equipment from which the spillage occurred.
- Rate and size of spill. / Spill control media

Emergency Actions in Case of Spillage

- Assess the situation and blow siren depending upon the situation.
- Stop operation if required.

- Stop hot jobs in surrounding area; suspend operations which are likely to create sparks.
- Check wind direction and approach from up ward direction
- Inform effluent treatment plant about the possibility of hydrocarbons coming into the effluent plant.
- Be prepared for firefighting if required start evacuation
- Cool down surrounding equipment / vessel with water.
- Vapors traveling in down wind direction should be knocked down with the fire water spray.
  Cordon off the area if required
- Evacuate non – essential persons from the surrounding depending upon the emergency.
- In case of liquid pool advice fire personnel to cover it with foam.

Control of toxic releases:

- A slow or intermittent release of chlorine may affect the people who are at outside the site.
- A major event leading to a sudden release of a large quantity of a toxic substance, which would form a large toxic cloud e.g. release to atmosphere of most of the contents of a storage vessel through the failure of a tank shell, man hole cover etc.
- Although the probability of occurring of such event is extremely low, the consequence would be severe for the people living close to the incident and in the path of cloud.
- The role of emergency service would be rescue, treatment of the injured, making safe the affected area etc.

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POSSIBLE ON-SITE EMERGENCY SCENARIOS & EMERGENCY RESPONSE PLAN

Liquid Chlorine Spillage and Pollution

In case of rupture of pipeline, breakage of valves of storage bullets possibility of liquid chlorine is there.

Chlorine is a very reactive chemical. Chlorine will react violently with hydrogen, acetylene gases, and solvents. These reactions create heat, or an exothermic reaction. Chlorine reactions with ammonia can create explosive compounds and gases that are toxic to breathe. Chlorine reacts with metals and heat and can cause fires. In the presence of water, chlorine can create a highly corrosive and dangerous acid mist.

Emergency Action:

Chlorine spills will become increasingly dangerous if they are not contained promptly. If a spill or leak has occurred, take the following actions:

1. Notify trained personnel immediately, such as the company HAZMAT team or the local fire department. Untrained persons or those without proper personal protective equipment must not enter areas with high concentrations of chlorine.
2. Evacuate people from the hazardous area for at least 50 feet in all directions and have them stay upwind from the chlorine release. They should be sheltered in a building with doors and windows shut and air conditioners turned off.
3. Stop or control the source of exposure. If the exposure is from a leaking cylinder, take the cylinder outdoors or to an open area until it has completely drained and the contents have evaporated.
4. Ventilate potentially explosive atmospheres by opening windows.
5. Keep combustibles such as wood, paper, and oil, away from the leak.
6. Remove all sources of heat and ignition.
7. Refer to the manufacturer's Material Safety Data Sheet (MSDS) for more information about Chlorine hazards.

Hazard from Electrolysis Process

1. Risk of electrocution, which may be caused by contact with faulty electrical installations or equipment (electrolysis cells) or when the work is carried out in a humid environment where electricity, chemical solutions and water are present.
2. Hazard of explosion due to the formation of hydrogen/chlorine mixture in the presence of ignition sources, such as UV radiation, electrical equipment and hot surfaces.
3. Injuries of the eyes and other parts of the body caused by splashed liquids from electrolysis cells, uncontrolled chemical reactions, during addition of solutions and/or substances into an electrolysis cell, and during drainage of caustic soda from an electrolysis cell.

4. Exposure to chlorine can cause the burning of eyes, the nose and the mouth, coughing, sneezing, choking and substantial pain, nausea and vomiting, headaches and dizziness, syncope, fatal pulmonary oedema, pneumonia, conjunctivitis, keratitis, pharyngitis, burning chest pain, hemoptysis, hypoxemia, dermatitis, skin blisters.

Preventive action:

Check periodically electrical equipment for safety before use and call a qualified electrician for testing and repair of faulty or suspect electrical equipment.

Sulphuric Acid Spillage and Pollution

In case of rupture of pipeline, breakage of valves of storage tank possibility of sulfuric acid is there. In case of spillage / pollution, Sulphuric fumes will create toxic effect in the surroundings. More ever the liquid Sulphuric splash has local corrosive and toxic effect.

Emergency action:

1. Check the land wall valve for its close position.
2. see the wind direction and stay upwind.
3. All personnel handling the emergency should invariably wear SCBA sets, PVC / Acid suit, gumboot PVC hand glove, Acid and Alkali proof goggles etc.
4. Cordon off the area and evacuate unwanted personnel from the surrounding area.
5. Isolate the source of supply to the leaky line / equipment if it safe to dose.
6. Start barricading the spillage area to prevent entry into storm water drain, contain the spillage in a limited area with the help of soil/lime.
7. Water curtain or fire water spray can be used to dilute the emergency vapors (depending upon the spilled chemicals properties)
8. Spillage sulfuric acid may be collected in sealable containers if possible.
9. Neutralize the left over with lime (every care should be taken of the addition of the lime as heat of neutralization would cause hot fumes &heat)
10. Neutralized mass should be transferred to effluent treatment plant for further treatment.
11. Flush the affected part with plenty of water and seek medical help in case of burning sensation persists.

Caustic lye Spillage and Pollution

Caustic lay is a corrosive chemical. Due to breakage of valves, pipeline connections of storage tank / storage tank burst out, caustic will get spilled. The spillage quantum will vary according to the size and volume of source of spillage. The effect of this spillage will be local spilled caustic will burn the body tissue and will damage the eyes severely if it comes in contact. No serious toxic is there due to caustic spillage.

Emergency Action:

1. All personnel handling the emergency should wear PVC suit / alkali suit, gumboot, pvc hand gloves PVC goggles.
2. Isolate the source of leakage.
3. cordon off the area.
4. Avoid the entry of unnecessary people.
5. start barricading the spillage area with sand /earth.
6. Spilled caustic is to be collected in sealable container if possible.

Explosion Hazards of PTFE

Finely divided PTFE resins can become extremely combustible in the presence of various metal fines. For example, metal fines (e.g., bronze, aluminum) mixed with powdered PTFE when exposed to high temperatures (above about 370°C) may react violently producing fire and/or explosion.

Once polymerization starts, an exothermic chain reaction may occur that develops high temperatures and pressures within the reactor and which can lead to possible explosion or violent rupture of the reactor and/or discharge of flammable and/or toxic gases.

Explosion in Natural Gas Pipeline

The leakage of the pipeline may occur from a chemical reaction resulting in internal corrosion as the natural gas has sulfur dioxide or sour gas. The external corrosion results from defects of coating material and cathodic protection method. The leakage of NG may also occur from flanges in the pipeline.

Emergency action:

1. Evacuate the workers and employees from the area of the leak.
2. Do not start up or shut down any machinery, vehicles or equipment in or near the area.
3. Stop the hot work immediately in the vicinity.
4. Keep people at a safe distance from the area. Upwind of a leak is the safest place to be.
5. Notify Incident Controller about the leak of natural gas.

Explosion in boiler:

Due to process abnormality and failure of safety devices provided, explosion of boiler can not be ruled out. More ever, steam drum can also fail due to material failure and process abnormalities. The steam drum failure can set a high pressure wave resulting into severe damage.

One of the most dangerous situations in the operation of a boiler is that of a Hydrogen Gas explosion used as fuel in the furnace. The inherent cause of Hydrogen Gas explosions can generally be traced back to an operations or maintenance problem. If a steam boiler is properly operated and maintained, including performance of all the necessary routine preventive maintenance, the likelihood of a hydrogen gas explosion is virtually eliminated.

The fragments of the exploded parts may fall on process pipelines / vessels in the surrounding area and can cause toxic gas release due to their failure.
The action plan will vary depending upon the contents of the ruptured pipeline / vessel. Hence the plant emergency action should be followed accordingly.

Emergency action:

1. Arrange for isolation by closing battery limit valve of Natural gas (NG) or Hydrogen Gas.
2. Don't allow anybody to enter without full body and respiratory protections if toxic gases / corrosive liquid leakage.
3. Cordon off the area and evacuate the people
4. Stop all hot jobs in the surrounding area. Suspend all the operations which are likely to create sparks.
5. Don't use water to fight fuel oil fire. Use foam, DCP cylinders.
6. Cool the nearby tanks / other equipments by spraying water on the surface to protect form radian theat.
7. Search for casualties caused by impacts of flying refractory brickbats and torn open metal parts.

Hazards of Reactor

1. Explosions from uncontrolled chemical reactions due to overpressure or due to release of energy from exothermal reactions (a result of mechanical damage or corrosion).
2. Exposure to hazardous substances due to a sudden release of toxic materials from a reactor due to the work- related accident or as a result of human error.
3. Exposure to high temperatures and heat-stress from chemical reactors.

4. Exposure to carcinogenic, mutagenic and teratogenic substances present in the reactor, or released from the reactor during cleaning and maintenance work.
5. Exposure to suspended dust can give rise to respiratory diseases.
6. Musculoskeletal injuries related to awkward working postures during inspections and/or maintenance works.
7. Corrosive chemicals pose a hazard by contributing to fire and explosion hazards; they have high toxicity and as a result can cause serious injury and even death

Preventive Action:

1. Check periodically electrical equipment for safety before use and call a qualified electrician for testing and repair of faulty or suspect electrical equipment.
2. Periodic checking of earthling shall be done.
3. Apply chemical safety rules when handling or working with hazardous chemicals.
4. All workers required handling corrosive chemicals or likely to come into contact with these chemicals should be informed of the hazards involved and trained accordingly.

Fire in Raw materials & finished goods storage

Type of Incident	Fire
Material	All Chemicals
Main Hazard	Release of Toxic Gases
Location	Raw Material Storage & Finished goods warehouse
Incident Scenario	An unlikely scenario could be due to fire, which could result from an electrical short circuit. Release of toxic gases due to spillage of liquid chlorine, HCl, Sulphuric Acid, Chloroform, Carbon Tetrachloride & Methylene Di Chloride.
Emergency Response Plan:	
	Activate the emergency team and call security for buzzing siren depending on the size of fire and level of emergency.
	Emergency shutdown of all equipment in the plant.
	Activate the evacuation plan and evacuate all the plant personnel except for the emergency response team members.
	Use of dry chemical fire extinguishers provided inside the plant area followed

	by the hydrant line.
	If the fire is beyond the fighting capability, consider controlled burning and ensure complete combustion of all the raw materials.
	All men shall be duly donned with fire suits and with complete breathing apparatus.
Personnel and Traffic Control	Close all access road to the Tank farm area & warehouse area and allow only emergency vehicles and personnel responsible for emergency response.
	Inform all the adjacent operating units.
	Stop all visitors or vendors from entering into the site.
Environment / Drainage Control	Remove all the contaminated material and either dispose it safely or incinerate, if required for complete combustion.
	Dispose the ash as approved by the regulatory authorities

Earthquake & Tremors

Scenario: Earthquake or tremors at site

All raw materials, finished products, consumables, packaging materials in Gujarat Fluorochemicals Limited, site & Site infrastructure facilities.

Personnel injury, fatality, damage to property and spill of raw materials and hazardous materials stored in the site.

Location: Entire sites

Considering the seismic zone all the facilities have been designed accordingly to withstand tremors and aftershocks.

Emergency Response Plan: Evacuate all personnel from the site after head count. Inform regulatory authorities, local police and fire brigade.

Do's:

(1) Alert others.
(2) Use the nearest emergency switch & stop the critical equipment /system.
(3) Use the nearest / shortest exit & get out of the building you are in.
(4) Stay away from the building.
(5) Assemble at the assembly point for headcount.
(6) Keep the lighting on.

Don'ts:

(1) Do not panic.
(2) Do not try to enter any of the buildings to stop any non-critical equipment if in case they are operating.
(3) Do not try to enter any of the buildings immediately after the tremors stop.

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Natural Calamities: Flood, Storm, and Cyclone

As we sited nearest to the sea, natural disaster like Flood, Storm and Cyclone may be the major possible emergencies. Adequate Emergency management plan and preparedness is essential to mitigate such dangers. For this, adequate preparedness and timely action is required. Following is the way to manage such situations:

A. Ensure availability and adequacy of following:

1. Emergency Torches
2. Rescue and Lifesaving equipment
3. Dewatering Pumps
4. Emergency Lights adequacy checking
5. Readiness of Emergency Vehicle like buses and cars.
6. Availability of trained emergency response team
7. Active action required from few departments like: Electrical, Utility and Administration
8. Ensure readiness of Tractor, Forklift etc.
9. Readily available Local and District Disaster management Plan
10. Emergency contact numbers like – LCG, DCG, DIA and Mutual industries

B. In case of flood or cyclone or both:

1. If prediction of such natural calamities is predicted/forecasted by meteorological department, Keep close watch on news channels and media.
2. Pay full attention on whether condition like abnormal wind speed, cloud, rain etc.
3. Manpower Management (Do not allow entry of Vendors/Visitors etc.)
4. For wind speed, Refer following Table:

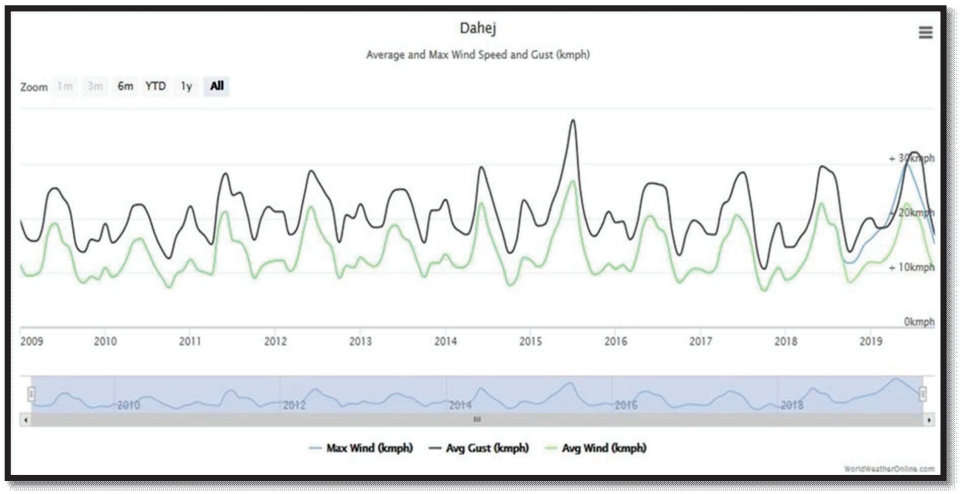
Beaufort number	Description	Wind speed	Sea conditions
0	Calm	< 1 mph < 2 km/h	Sea like a mirror
1	Light air	1–3 mph 2–5 km/h	Ripples with appearance of scales are formed, without foam crests
2	Light breeze	4–7 mph 6–11 km/h	Small wavelets still short but more pronounced c rest shaveaglassy appearance but do not break
3	Gentle breeze	8–12 mph 12–19 km/h	Large wavelets: crests begin to break; foam of glassy appearance; perhaps scattered white horses

4	Moderate breeze	13–18 mph 20–28 km/h	Small waves becoming longer; fairly frequent white horses
5	Fresh breeze	19–24 mph 29–38 km/h	Moderate waves taking a more pronounced long form; many white horses are formed; chance of some spray
6	Strong breeze	25–31 mph 39–49 km/h	Large waves begin to form; the white foam crests are more extensive everywhere; probably some spray
7	moderate gale,	32–38 mph 50–61 km/h	Sea heaps up and white foam from breaking waves begins to be blown in streaks along the direction of the wind; spindrift begins to be seen
8	Gale,	39–46 mph 62–74 km/h	Moderately high waves of greater length; edges of crests break into spindrift; foam is blown in well-marked streaks along the direction of the wind
9	Strong/severe gale	47–54 mph 75–88 km/h	High waves; dense streaks of foam along the direction of the wind; sea begins to roll; spray. affects visibility
10	Storm	55–63 mph 89–102 km/h	Very high waves with long overhanging crests; resulting foam in great patches is blown in dense white streaks along the direction of the wind; on the whole the surface of the sea takes on a white appearance; rolling of the sea becomes heavy; visibility affected
11	Violent storm	64–72 mph 103–117 km/h	Exceptionally high waves: small- and medium-sized ships might be for a long time lost to view behind the waves; sea is covered with long white patches of foam; everywhere the edge soft he waves crests are blown into foam. visibility affected
12	Hurricane force	≥ 73 mph ≥ 118 km/h	The air is filled with foam and spray; sea is completely white with driving spray; visibility. very seriously affected
References: Met Office, Royal Meteorological Society, *Britannica*			

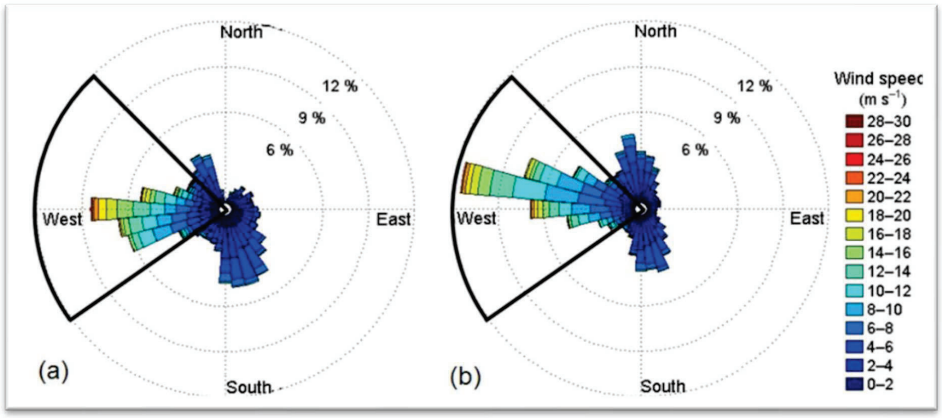
In Dahej area, normal wind speed is 7 KMPH which falls under light breeze. For current weather forecast or condition, visit:www.worldweatheronline.comand keep yourself updated. Use zip code 392130. Refer Appendix for average normal wind speed and Wind direction of Dahej.

APPENDIX

Wind Speed (Yearly Average) :



Wind Direction



(a) December to May (b) June to November

Personnel & Traffic Control:

Close all site roads and restrict. Do not enter the site unless it is absolutely safe to do so. Only the ER team shall enter first and upon clearance from the Incident Commander the others shall enter.

Environment / Drainage Control:

In case of any hazardous material spill, try to recover by scrapping and reloading into the drums only if the access is clear. Try & clear the HSD spill by using absorbents and incinerate the waste.

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LIST OF ANNEXURES

Sr. No.	Annexure Title	Annexure No.
1	Identification of the Factory	Annexure -1
2	Map of the Area	Annexure -2
3	Factory Lay Out	Annexure -3
4	List of raw materials, storage capacity, hazards and controls	Annexure -4
5	Material Safety Data Sheets (Separate Volume)	Annexure -5
6	Process and Vessel / Hazards and Controls	Annexure -6
7	Identification of other Hazards and Control	Annexure -7
8	Trade Waste Disposal	Annexure -8
9	Records of Past Incidents	Annexure -9
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31	ISO 14001:2004 Certificate	Annexure -32
32	OHSAS 45001:2018 Certificate	Annexure -33
33	QHSE Policy	Annexure -34

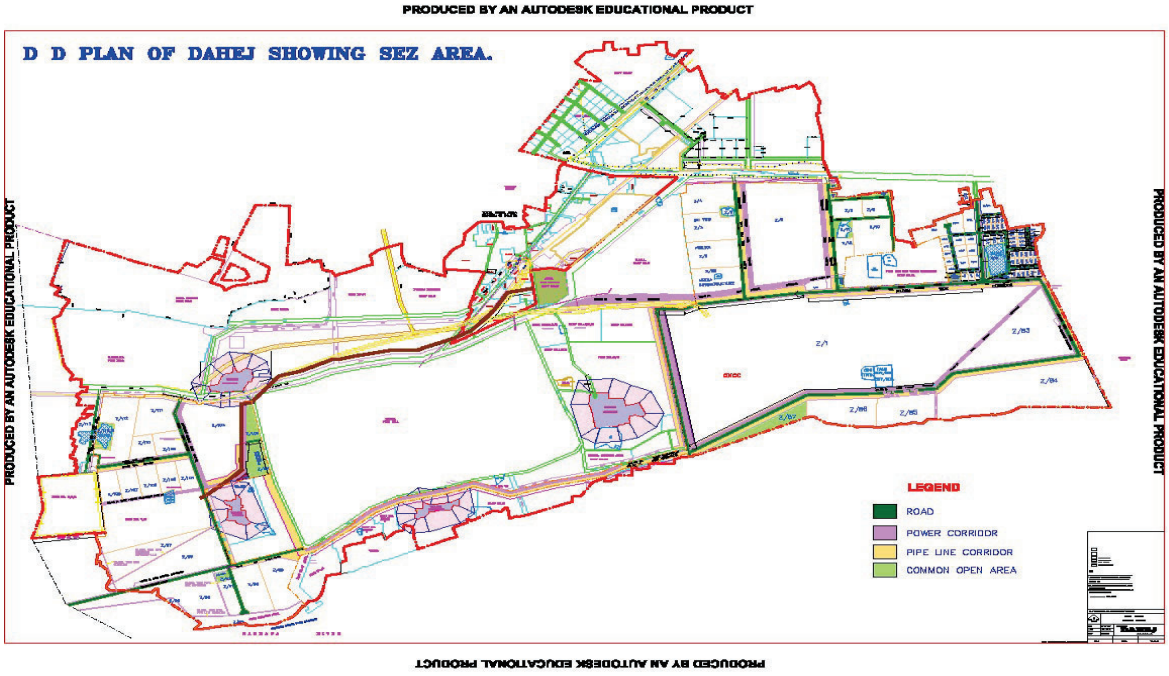
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ANNEXURE – 1: Identification of the Factory



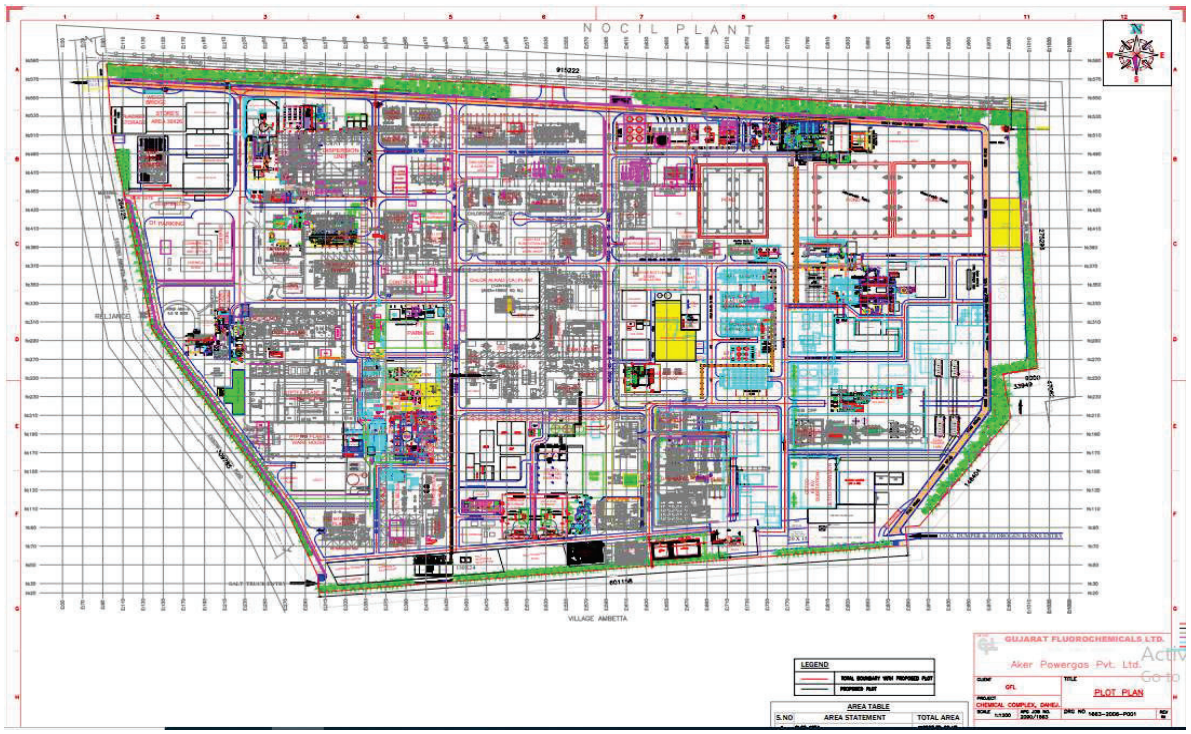
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ANNEXURE – 2: Map of the Area



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ANNEXURE – 3: Factory Layout



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ANNEXURE – 4: LIST OF RAW MATERIALS, STRORAGE CAPACITY, HAZARDS AND CONTROLS

Sr. No.	Name of the hazardous Chemical (mention concentration if	UOM	Quantity Maximum storage capacity	Actual stored (including in process handling)	Storage Type (tank, cylinder, drum, bags etc.)	Probable Hazards (fire, explosion toxic release, spill, etc.)	Control Measures provided	Facilities in case of Emergency
1	Liquid Chlorine	M3	315 (105X 3)	179	Bullet	Toxic release, spillages	Steel bullet, Standby bullet, electric connection- flame proof as per IS – 2148, online breathing air pipeline with air Mask assembly, CASCADE Trolley, standby breathing air cylinders, 4No DCP type fire extinguisher, Cautionary boards displayed, sprinkler system, and fencing, Fire hydrant network cover to bullet area	Chlorine Gas Detectors, Water sprinkler system, Fire hydrant system, breathing apparatus, Airline mask, Waste gas scrubber system, Fire extinguishers, Full fledge Fire control room with fire tender, OHC with round the clock nurse available.
2	Methanol	MT	250 (50X2 +150)	213	Tank	Fire, Explosion and Spillages	Steel bullet, Standby bullet, electric connection- flame proof as per IS – 2148, online breathing air pipeline with air mask assembly, standby breathing air cylinders,4No DCP type fire extinguisher, Cautionary boards displayed, sprinkler system, fencing	Flammable Gas detectors, Water sprinkler system, Fire hydrant system, Foam type Fire extinguishers, and Sand bucket; Full fledge Fire control room with fire tender, OHC with round the clock nurse available.
3	Sulphuric acid (98%)	MT	608 (100m3 X3 Tanks, 30.5m3)	517	Tank	Toxic release, spillages	Dyke wall, Scrubber system, fire extinguishers, Safety shower	Fire hydrant system, Scrubber system, breathing apparatus, Airline mask, Fire extinguishers, Full fledge Fire control room with fire tender, OHC with round the clock nurse available
4	Sulphuric acid (88%)	MT	360 (100 m3 X 2 Tanks)	306	Tank	Toxic release, spillages	Dyke wall, Scrubber system, fire extinguishers, Safety shower	Fire hydrant system, Scrubber system, breathing apparatus, Airline mask, Fire extinguishers, Full fledge Fire control room with fire tender, OHC with round the clock nurse available
5	Hydrochloric acid (31%)	MT	260 (50m3 X 04) (26m3)	221	Tank	Toxic release, spillages	Dyke wall, Scrubber system, fire extinguishers, Safety shower	Fire hydrant system, Scrubber system, breathing apparatus, Fire extinguishers, Full fledge Fire control room with fire tender, OHC with round the clock Nurse available
6	Methylene Dichloride	MT	375 (150m3 X 2) (75m3 X 1)	319	Closed cylinder lca vertical containper	Fire, Explosion, Toxic release	Dyke wall, safety shower, fire extinguishers, breathing apparatus	Water sprinkler system, Fire hydrant system, breathing apparatus, Online Airline mask, Fire extinguishers, and Full fledge Fire control room with fire tender, OHC with round the clock nurse available

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Sr. No.	Name of the hazardous Chemical (mention concentration if	UOM	Quantity Maximum storage capacity	Actual stored (including in process handling)	Storage Type (tank, cylinder, drum, bags etc.)	Probable Hazards (fire, explosion toxic release, spill, etc.)	Control Measures provided	Facilities in case of Emergency
7	Chloroform	MT	237 (100m3& 60 m3)	201	Tank	toxic release	Dyke wall, safety shower, fire extinguishers, breathing apparatus	Water sprinkler system, Fire hydrant system, breathing apparatus, Online Airline mask, Fire extinguishers, and Full fledge Fire control room with fire tender, OHC with round the clock nurse available.
8	Carbon Tetrachloride (CTC)	MT	268 (100m3 & 75m3)	228	Tank	Toxic release	Dyke wall, safety shower ,fire extinguishers, breathing apparatus	Water sprinkler system, Fire hydrant system, Breathing apparatus, Online Airline mask, Fire extinguishers, and Full fledge Fire control room with fire tender, OHC with round the clock nurse available.
9	Natural Gas (NG)	SCM/D	190000, 2.45 bar, 30-40 ^{o}C	NA	NA	Fire	Fire Extingusher	Fire hydrant system, breathing appartus, fire extingusher and fire control room with fire tender, OHC with round the clock medical staff available.
10	Coal	MT	15000	13500	Coal Storage Yard	Fire	Fire Extinguishers Safety shower, fire extinguishers, breathing apparatus	Fire hydrant system, breathing apparatus, Fire extinguishers, and Full fledge Fire control room with fire tender, OHC with round the clock nurse available.
11	Hydrogen Gas	Nm3/ Day	100000	NA	Not Stored, Transferred to Hydrogen Bank	Fire, explosion	Safety shower, fire extinguishers, breathing apparatus	Fire hydrant system, Breathing apparatus, , Fire extinguishers, and Full fledge Fire control room with fire tender, OHC with round the clock nurse available.
12	Caustic Lye (32%)	MT	310 (117.5m3 X 2	264	Tank	Caustic Splash	Dyke Wall, Safety shower, fire extinguishers, breathing apparatus	Fire hydrant system, breathing apparatus, Fire extinguishers, and Full fledge Fire control room with fire tender, OHC with round the clock nurse available.
13	Caustic Lye (48%)	MT	3576 (400m3 X 3, 1200m3)	3040	Tank	Caustic Splash	Dyke Wall, Safety shower, fire extinguishers, breathing apparatus	Fire hydrant system, breathing apparatus, Fire extinguishers, and Full fledge Fire control room with fire tender, OHC with round the clock nurse available.

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Sr. No.	Name of the hazardous Chemical (mention concentration if	UOM	Quantity Maximum storage capacity	Actual stored (including in process handling)	Storage Type (tank, cylinder, drum, bags etc.)	Probable Hazards (fire, explosion toxic release, spill, etc.)	Control Measures provided	Facilities in case of Emergency
14	Anhydrous Hydrofluoric Acid (AHF)	MT	18.07	18	Bullet	Toxic Release	Safety Shower, SCBA, Breathing Air Compressor, Positive Pressure Control room, First Aid Kit	Safety Shower, SCBA, Breathing Air Compressor, Positive Pressure Control room, First Aid Kit, Emergency Dum tank, Dyke Wall, Centralized Scrubber System,
15	Dilute Hydrofluoric Acid (20% DHF)	MT	80	68	Tank	Toxic Release	Safety Shower, SCBA, Breathing Air Compressor, Positive Pressure Control room, First Aid Kit	Back End Scrubber System
16	Flurosilicic Acid (H2SiF6 30%)	MT	100	85	Tank	Toxic Release	Safety Shower, SCBA, Breathing Air Compressor, Positive Pressure Control room, First Aid Kit	Safety Shower, SCBA, Breathing Air Compressor, Positive Pressure Control room, First Aid Kit, Emergency Dum tank, Dyke Wall, Centralized Scrubber System, Back End Scrubber System
17	Vinylidene Fluoride (VDF)	m3	39	39	Bullet	Toxic release, Spillages	Safety Shower, Cartridge Mask, First Aid Kit, Full body PVC Suit, Safety Shoes, Safety Gum Boot, PVC Hand gloves	Safety Shower, First Aid Kit, Cartridge Mask, Full body PVC Suit, Safety Shoes, Safety Gum Boot, PVC Hand gloves, Emergency Dum tank, Dyke Wall Safety Shower, SCBA, Breathing Air Compressor, Positive Pressure Control room, First Aid Kit, Full body PVC Suit, Safety Shoes, Safety Gum Boot, PVC Hand gloves, Fire hydrant system, Fire extinguishers and Full fledge Fire control room with fire tender, OHC with round the clock nurse available.
18	Oleum	KL	200 (100 X 2 No.)	170	Vertical Cylindrical storage tank	Toxic Release	Level Transmeter and Level switch with Interlock of high level with Pump	One spare storage tank is remained always empty for transfer of material from one storage tank to another storage tank with pump, Safety Shower, SCBA, Positive Pressure Control room, Chemical Suit,Fire hydrant system, Fire extinguishers and Full fledge Fire control room with fire tender, OHC with round theclock nurse available.
19	R-142-B	KL	79	79	Bullet	Fire	Dyke wall, safety shower ,fire extinguishers, breathing apparatus	Water Curtain system , Fire hydrant system,Breathing apparatus, Air line mask,, Fire extinguishers, Full fledge Fire control room with fire tender, OHC with round the clock nurse available.

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ANNEXURE – 5: MATERIAL SAFETY DATASHEETS

1. MSDS –Material Safety Data Sheets of all the Chemicals are available at Emergency control center & in safety Dept.

2. Plant wise MSDS available at all the Plant Control Rooms.

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ANNEXURE- 6: PROCESS & VESSEL HAZARDS AND CONTROLS

Sr. No.	Name of the Plant, Department or Place	Name of the hazardous process and operation	Materials in the process /operation with their quantity	Name of the vessel and its location	Operation parameters: pressure, temperature etc.	Type of hazards possible (exothermic, runaway, pressure release, toxic release, fire explosion etc.	Control measure provided	In charge Person	
								Name and Designation	Telephone Number
1	Chloro Alkali Plant	Electrolyzing	Hydrogen, Caustic & Cl_2	Electrolyzer	Pressure, Temperature, Flow	Explosion, Cl2 leakage & Caustic Splash	DCS control with Interlock , Gas detector alarm	HOD	8106
2	Chloro Alkali Plant	Cl_2 Washing & Drying	Cl_2	Cl_2 Cooling & Washing Tower	Pressure, Temperature	Cl2 Leakage	DCS control with Interlock , Gas detector alarm	HOD	8106
3	Chloro Alkali Plant	H_2 Washing	H_2	H_2 Washing Tower	Pressure, Temperature	Explosion	DCS control with Interlock, Pressure Relief Valve	HOD	8106
4	Chloro Alkali Plant	H_2 Compression	H_2	H_2 Compressor	Pressure, Temperature	Explosion	DCS control with Interlock, Gas Detection System.	HOD	8106
5	Chloro Alkali Plant	Caustic Concentration	Caustic	Evaporation Unit	Pressure, Temperature, Flow	Caustic Splash	DCS control with Interlock	HOD	8106
6	Chloro Alkali Plant	Cl_2 Liquefier	Cl_2	Liquefier	Pressure, Temperature	Cl2 Leakage	DCS control with Interlock , Gas detector alarm	HOD	8106
7	Chloro Alkali Plant	Cl_2 Vaporizer	Cl_2	Vaporizer	Pressure, Temperature	Cl2 Leakage	DCS control with Interlock , Gas detector alarm	HOD	8106
8	Chloromethanes Plant	Chlorination	Methanol and HCL as per plant load	Hydrochlorination or Pressure,	Flow, Temperature	Leakage/ rupture in the out let pipe	Interlocks connected to DCS to Monitor parameters	HOD	8131
9	Chloromethanes Plant	Stripping	Chloromethane as per plant load	Organic Stripper	Temperature	Leakage through nozzles, gaskets, flanges etc due to unavailability/failure of cooling water	Interlocks connected to DCS to Monitor parameters	HOD	8131
10	Chloromethanes Plant	Absorption	HCl, Caustic soda and water as per plant load	HCl absorber	Flow, Pressure	High pressure/ levels	Interlocks connected to DCS to Monitor parameters	HOD	8131

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Sr. No.	Name of the Plant, Department or Place	Name of the hazardous process and operation	Materials in the process /operation with their quantity	Name of the vessel and its location	Operation parameters: pressure, temperature etc.	Type of hazards possible (exothermic, runaway, pressure release, toxic release, fire explosion etc.	Control measure provided	In charge Person	
								Name and Designation	Telephone Number
11	Chloromethanes Plant	Quenching	Chloromethane, HCl and water as per plant load	Quenching and dehydrating system	Flow, Temperature	Leakage in the reactor outlet pipe/ Rupture in bellow EX2104	Interlocks connected to DCS to Monitor parameters	HOD	8131
12	Chloromethanes Plant	Chlorination	Methyl chloride and chlorine as per plant load	Thermal chlorination section- CH_3Cl distillation section	Pressure, Temperature , Flow	Closure of manual valves, Malfunctioning of LIA2307	Interlocks connected to DCS to Monitor parameters	HOD	8131
13	TFE Plant	Combustion	Natural gas and steam	Back firing furnace	Flow, Temperature	Explosion and Fire	Interlocks connected to DCS to Monitor parameters	HOD	8290
14	TFE Plant	Condensation	Tetra Fluoroethylene	TFE Condenser	Flow, Temperature, pressure	Explosion	RCC Explosion proof covering to reactor	HOD	8290
15	TFE Plant	Thermal Cracking	Chlorodifluoromethane	Steam heated Furnace & Cracking reactor	Pressure, Temperature	Explosion	RCC Explosion proof covering to reactor	HOD	8290
16	TFE Plant	Distillation	Tetrafluoro ethylene and other hydro carbons as per the plant load	Distillation tower	Temperature, Pressure	Explosion	RCC Explosion proof covering to reactor	HOD	8290
17	PTFE Plant	MMT,MST, Condense Process	Tetra fluoroethylene	MMT, Metacones Process	Pressure, Temperature	Explosion & Self Polymerization	RCC Explosion proof covering to all reactors, DCS Monitoring & Field Observations	HOD	8274
18	PTFE Plant	Polymerization	Tetra fluoroethylene, de-ionized water,	Reactors & Silica Gel	Pressure, Temperature	Explosion, Run Away Reaction	Interlocks connected to DCS to Monitor parameters , RCC Explosion proof Separation wall.	HOD	8274
19	Power Plant	Steam Generation	Natural Gas, Hydrogen & Coal	Boiler	Pressure, Temperature	Explosion	Pressure Relief Valve, Temperature & Pressure Indicator	HOD	8146
20	AHF Plant	Combustion, Reaction, Condensation, Distillation	Natural Gas, Hydrofluoric Acid, Sulfuric Acid, Oleum Acid, Chloroform, Chlorofluoromethane	Kiln, Associator, Striping Column, Distillation Column, Reactor, Stripper, Distillation Tower	Flow, Temperature Pressure,	Toxic release, fire explosion	Interlocks connected to DCS to Monitor parameters, Back End Scrubber, Dump Tank, Centralized Scrubber	HOD	8306

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Sr. No.	Name of the Plant, Department or Place	Name of the hazardous process and operation	Materials in the process /operation with their quantity	Name of the vessel and its location	Operation parameters: pressure, temperature etc.	Type of hazards possible (exothermic, runaway, pressure release, toxic release, fire explosion etc.	Control measure provided	In charge Person	
								Name and Designation	Telephone Number
21	FKM Plant	Polymerization	TFE, HFP & VDF	Reactor	Pressure & Temperature	Toxic release, fire explosion	Interlocks connected to DCS to Monitor parameters , RCC Explosion proof Separation wall, Field Observation	HOD	8193
22	E- TFEE Plant	Polymerization	Ethanolic KOH & TFE	Reactor	Pressure & Temperature	Toxic release, fire explosion	Interlocks connected to DCS to Monitor parameters , RCC Explosion proof Separation wall, Field Observation Separation wall, Field Observation	HOD	8193
23	A & H Plant	Unloading of Oleum tanker into Oleum	Oleum	Oleum Storage tank T-3102-A/B, Located at G. Floor in Tank farm	Atmospheric Pressure & ambient Temp.	Toxic Release	Level Transmeter and Level switch with Interlock of high level with Pump	HOD	8306

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ANNEXURE – 7: IDENTIFICATION OF OTHER HAZARDS AND CONTROL

Sr. No.	Name of the possible hazard or emergency	Its source and reasons	Its effects on persons & property	Place of effect	Control measures provided	In charge person at source (3)	
						Name and Designation	Tele. Number
1	Line rupture of chlorine liquid pipeline from liquefier to bullets	Length -30 m, ID - 101.6 mm, Inventory of liquefied gas- 6.46 ton/hour, pressure of the line -5Kg/cm2.	Extremely toxic gas	CMS Control Room, Dahej Village	No flange joint, all weld joint is tested by MPT design of pipe is as per the operating parameters.	HOD	8106
2	Line rupture of chlorine liquid pipeline from Chlorine bullet to pump	Length -5.0 m, ID - 150.0 mm, Inventory of liquefied gas– 1.5-ton, pressure of the line -5 Kg/cm2.					
3	Line rupture of chlorine canned pump discharge to vaporizer	Length -35.0 m, ID - 60.0mm, Inventory of liquefied gas– 1.8 ton, pressure of the line-17.5 Kg/cm2.					
4	Line rupture of chlorine gas pipe line from vaporizer to CMS plant.	Length -200 m, ID - 101.6 mm, Inventory of liquefied gas - 6 ton/ hour , pressure of the line - 12.5 kg/cm2	Extremely toxic gas	CMS Control Room, Dahej Village	No flange joint, all weld joint is tested by MPT; design of pipe is as per the operating parameters.	HOD	8106
5	Leak of chlorine from pipe line vaporizer to CMS plant.	Hole diameter – 5 mm, Inventory of liquefied chlorine – 6 ton/ hour, Pressure of the line – 11.8 bar(g)	Extremely toxic gas	CMS Control Room, Dahej Village	No flange joint, all weld joint is tested by MPT; design of pipe is as per the operating parameters.	HOD	8106
6	Catastrophic rupture of Cl2 bullet.	MS horizontal tank, inventory of chlorine – 147000 kg , pressure of the storage – 10.77 bar(g)	Extremely toxic gas	CMS Control Room, Dahej Village	Concrete bund, bullet is fabricated, tested as per the norms of CCOE and approved by the CCOE.	HOD	8106
7	Catastrophic rupture of methanol storage tank	Vertical tank Dia – 3.6 m, ht. –4.8 m, inventory – 8000kg	Highly flammable liquid	CMS Control Room, Chlorine Storage	Concrete bund, Tank is fabricated, tested as per	HOD	8131

GUJARAT FLUOROCHEMICALS LIMITED

Sr. No.	Name of the possible hazard or emergency	Its source and reasons	Its effects on persons &property	Place of effect	Control measures provided	In charge person at source (3)	
						Name and Designation	Tele. Number
				Tank & TFE Substation	the norms of CCOE and approved by the CCOE.		
8	Catastrophic rupture of methylene chloride tank	Horizontal tank, Dia. - 4.1 m, length - 6.1 m, inventory – 145000 kg.	Flammable Highly toxic	CMS Control Room, Dahej Village	Dyke provided to contain leakages, Tankis fabricated, tested.	HOD	8131
9	Line rupture of NG pipe line in back firing furnace	Length – 65 m , ID – 250 mm , inventory of material – 300kg / hour ,Pressure –2.45 (g)	Explosive	Monomer Tank, Substation and Cl_2 Storage Tank	No flange joint, all weld joint is tested by MPT; design of pipe is as per the operating parameters.	HOD	8290
10	Line rupture of NG pipe line supplying fuel to CPP plant	Length – 160 m ,Dia. - 76.2 mm, inventory – 7083.3 ton / hour	Explosive	CPP, Common utility Substation	No flange joint, all weld joint is tested by MPT, design of pipe is as per the operating parameters.	HOD	8146
11	Line rupture of Chlorodifluoromethane in PTFE Plant	TFE Plant	Explosive	PTFE Plant	Flame detonators installed in lines to preventflame propagation	HOD	8274
12	TFE Line Rupture in pipe rack	Length – 700 m, Dia. - 50 mm, inventory : 300 to 1000 Kg / Hrs., Pressure – 6.5 to 7 Kg / cm2	Explosive	PTFE Plants Pipe Rack	Rupture disk, Vent valve interlock with line pressure, Flame arrester	HOD	8274 8193 8290
13	AHF Check Tank, Kiln Pressurized, HF Crude Vessel Leak, Distillation Re boiler & Column Pressurized & leak, Dump Tank Leak, Associate Tank Leak	AHF Check Tank 02 Nos. Capacity 50MT Inventory – HF Gas release for 1/2 hr Kiln: Length – 22m, Dia.-2m. Inventory – HF Gas release for ½ hr HF Crude Vessel: 02Nos. ,Capacity 4MT HF Gas release for ½ hrs Distillation Reboiler & Column: 02No, Capacity 2MT HF	Toxic Releases	A& H Plant & Surrounding up to 500Meter is Red Zone towards wind Direction.	Dump Tank, Dyke Wall, Back End Scrubber, Centralized Scrubber, Plant Scrubber.	HOD	8306

GUJARAT FLUOROCHEMICALS LIMITED

Sr. No.	Name of the possible hazard or emergency	Its source and reasons	Its effects on persons &property	Place of effect	Control measures provided	In charge person at source (3)	
						Name and Designation	Tele. Number
		Gas release for ½ hrs					
14	Vinylidene Fluoride	Flange Leakage, Corrosion in Skid and associated instruments	Toxic Release Fire & Explosion	FKM and nearby plants	Skid stored in shed. Sprinkling system provided to keep skid cool.	HOD	8193
15	Spillage, Fire, Explosion in Ethanolic KOH Tank	Flange Leakage, Pipeline / Tank Corrosion	Highly flammable liquid	CMS Control Room, Chlorine Storage Tank & TFE Substation	Concrete bund, Tank is fabricated, tested as per the norms of CCOE and approved by the CCOE.	HOD	8193

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ANNEXURE – 8: TRADE WASTE DISPOSALS

Sr. No.	Type and name of the trade waste	Its generation per day	Place of its safe disposal	Place of its safe disposal	Treatment method of safe disposal (treatment plant, vent gas scrubber, flare, incinerator, water blanketing etc.)	Alarm indicating accidental release of release in excessive proportion	Monitoring and control measures provided	In charge person	
								Name and Designation	Tele Number
1	Brine sludge	12160 MT/Year	CA Plant	It is disposed of at TSDF site Bharuch Enviro Infrastructure limited at Ankleshwar	BEIL, Ankleshwar. GSPL, Surat RSPL, Panoli	Not applicable	As per hazardous waste (management and handling) rule - 2008	HOD	8129
2	Used oil	36 KL/Year	All Plants	It is sold to CPCB / MOEF authorized parties for disposal.	Disposed of to recycler with MOEF registered agency	Not applicable	As per hazardous waste (management andhandling) rule –2008	HOD	8129
3	Spent catalyst	18 MT/Year	CMS Plant	It is disposed of at TSDF site Bharuch Enviro Infrastructure limited at Ankleshwar	BEIL, Ankleshwar. GSPL, Surat RSPL, Panoli	Not applicable	As per hazardous waste (management and handling) rule – 2008	HOD	8104
4	Discarded carboys/ Drums / Cylinder	Whenever generated	All Plants	It is sold to authorized recycler or decontaminated within our own premises and then sold off or there will be by back arrangement with the supplier(s)	BEIL, Ankleshwar. GSPL, Surat RSPL, Panoli	Not applicable	As per hazardous waste (management and handling) rule – 2008	HOD	8129
5	Sludge from wet scrubber	Whenever generated	All Plants	It is disposed of at TSDF site Bharuch Enviro Infrastructure limited at Ankleshwar	BEIL, Ankleshwar. GSPL, Surat RSPL, Panoli	Not applicable	As per hazardous waste (management and handling) rule – 2008	HOD	8090
6	ETP Sludge	1560 MT/Year	ETP Plant	It is disposed of at TSDF site Bharuch Enviro Infrastructure	BEIL, Ankleshwar. GSPL, Surat RSPL, Panoli	Not applicable	As per hazardous waste (management andhandling) rule –2008	HOD	8090
7	Resins from DM Plant	9 MTPA	Utility	It is disposed of at TSDF site Bharuch Infrastructure limited at Ankleshwar	BEIL, Ankleshwar. GSPL, Surat RSPL, Panoli	Not applicable	As per hazardous waste (Management and handling) rule – 2008	HOD	8164 /8143

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ANNEXURE – 9: RECORDS OF PAST INCIDENTS

Sr. No.	Type of incident (major accident, emergency of disaster)	Date and time of occurrence	Its place	Duration	Time required in controlling it	No. of workers working at that time	Persons affected		Persons died		Effects on the Survivors		Subsequent safety measures provided	Other details if any dates user etc.
							Inside the factory	Outside the factory	Inside the factory	Outside the factory	Immediate	Delay		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Refer Form No. 29 (Accident Register)							--- NIL---							

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ANNEXURE – 10: GAS DISPERSION CONCENTRATION

Product CHLORINE	Maximum concentration (ppm) in downwind direction										
	100 M	200 M	300 M	400 M	500 M	700 M	1 KM	2 KM	3 KM	4 KM	5 Km
Scenario 1	Weather conditions: Wind velocity: 5 m/s, Atmospheric stability: F, Relative Humidity: 75%, Air Temperature: 27° C										
	2650	863	450	286	202	120	69.2	22.9	11.1	6.6	4.4

Product CHLORINE	Maximum concentration (ppm) in downwind direction.										
	100 M	**200 M**	**300 M**	**400 M**	**500 M**	**700 M**	**1 KM**	**2 KM**	**3 KM**	**4 KM**	**5 Km**
CHLORINE leak :- Assuming continuous release of 3 Kg/cm2 chlorine gas to the atmosphere in ppm	Weather condition: - wind velocity 3 M/ sec. the down wind concentration at various distances calculated EFFECTS-s Software for must unstable after noon weather condition.										
	790	**237**	**117**	**71**	**48.2**	**26.9**	**14.5**	**4.33**	**2.14**	**1.3**	**0.881**
CHLORINE leak :- Assuming continuous release of 3 Kg/cm2g chlorine gas to the atmosphere in ppm.	Weather condition: - wind velocity 5 M/ sec. the downwind concentration at various distances calculated EFFECTS-s Software for must unstable after noon weather condition.										
	316	**94.8**	**46.8**	**28.4**	**19.3**	**10.7**	**5.78**	**0.857**	**1.73**	**0.52**	**0.353**

Product CHLORINE	Maximum concentration (ppm) in downwind direction.										
	100 M	**200 M**	**300 M**	**400 M**	**500 M**	**700 M**	**1 KM**	**2 KM**	**3 KM**	**4 KM**	**5 Km**
CHLORINE leak :- Assuming catastrophic failure of one chlorine tonner and instantaneous release of 900 kg of chlorine gas intothe atmosphere in ppm.	Weather conditions: Wind velocity : 5 m/s, Atmospheric stability: F, Relative Humidity: 75%, Air Temperature: 27° C										
	2650	863	450	286	202	120	69.2	22.9	11.1	6.6	4.4

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ANNEXURE – 11: EVACUATION TABLE

Evacuation Table Based on Prevailing Wind of 6 to 12 sec (2, 7, to 3, 4 m per sec) (Vulnerable area based on PHAST software)			
Material	**Radius of immediate danger area (KM)**	**Dimension of Evacuation area**	
		Downwind (KM)	**Cross wind (KM)**
Chlorine –Failure of Chlorine Bullet	>10 KM	5.05 KM	5.05 KM
Chlorine –Line leakage of Liquid Chlorine from liquefier to bullet	1.4 KM	5 KM	5 KM
Chlorine –Line leakage of liquid chlorine from tonner	1.1 KM	5.05 KM	0 KM
Chlorine –Line Leakage of Cl2 from Evaporator to plant	.071 KM	.232 KM	.232 KM -

Further detailed hazardous material emergency vulnerable zone marked in Disaster Mgt. Plan report Table VI.6

Evacuation Table based on **Instantaneous Release** of 900 Kg. of Chlorine gas due to catastrophic failure of one Chlorine tonner with wind speed of 2 mts/sec. (calculated EFFECTS-s Software)			
Material	**Radius of immediate danger area (KM)**	**Dimension of Evacuation area**	
		Downwind (KM)	**Cross wind (KM)**
CHLORINE-Line leakage of Liquid chlorine from pump to tonner	0.789 KM	5 KM	5 KM

Evacuation Table based on Continuous Release of 3 Kg. /sec of Chlorine gas for 600 seconds due to leakage of one Chlorine tonner with wind speed of 2 mts/sec. (calculated EFFECTS-s Software)			
Material	**Radius of immediate danger area (KM)**	**Dimension of Evacuation area**	
		Downwind (KM)	**Cross wind (KM)**
CHLORINE-Failure of Tonner	3.5 KM	5 KM	5 Km
Hydrogen-Failure of Hydrogen Cylinders	0.047 Km	0.024 Km	0.024 Km
Hydrogen-Leak from H2 cylinders Through ¾ Instrument tubing	0.015 Km	0.024 Km	0.024 Km
Methanol- Failure of MeOH tank	0.0190 Km	0.025. Km	0.025. Km
Methanol- Leakage from the tank or Associate lines	>. 010.. Km	.020 Km	.020 Km
Methanol – Failure of Methanol tanker	0.022 Km	0.028 Km	0.028 Km
Anhydrous Hydrofluoric Acid-Failure of HF storage vessel	0.909 Km	2.7 Km	2.7 Km
Anhydrous Hydrofluoric Acid-Leakage from HF vessel	2. Km	<10 Km	<10 Km
Methylene Chloride- Failure of Methylene Chloride tank	0.251 Km	0.835 Km	0.835 Km
Methylene Chloride- Leakage from 2” leak in Methylene chloride tank	0.114 Km	0.359 Km	0.359 Km
Chloroform- Failure of Chloroform tank	0.530 Km	1.3 Km	1.3 Km
Chloroform-2” leak in Chloroform tank	0.074 Km	0.167km.	0 .167 km
Carbon Tetra Chloride (CTC)-Failure of CTC tank	0.291 Km	0.603 Km	0.603 Km
Carbon Tetra Chloride-2” leak in CTC tank	0.300 Km	0.600Km	0.600Km

Oleum-failure of Oleum storage tank	0.146 Km	0.346Km	0.346Km
Oleum-2" leak in Oleum tank	>0.003Km	-	-
Natural Gas -Leak from NG pipeline Explosion	0.114 Km	0.285 Km	0.285 Km
Natural Gas - Natural Gas Over Pressure (Blast force)	0.99 Km	0.127km	0.127km
Natural Gas - Leak from pipeline Thermal radiation from jet fire	0.300 Km	0.46 Km	0.46 Km

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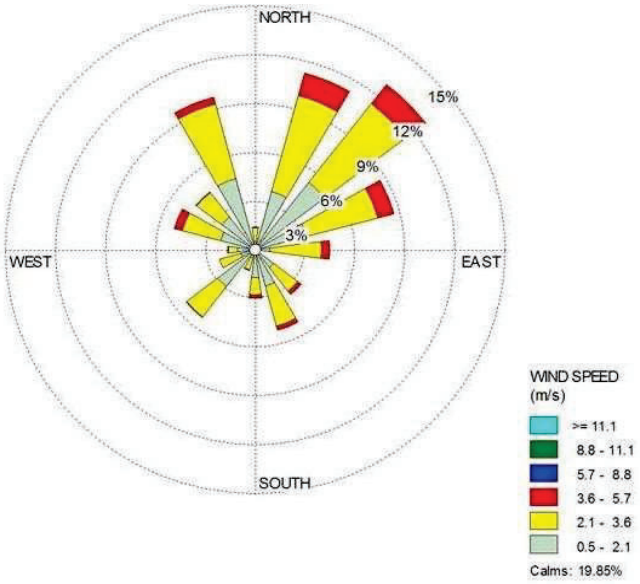
ANNEXURE – 12: ENVIRONMENT IMPECT ASSESSMENT

Sr. No.	Distance (Radius) from the Factory	Environment (Employees Nutrient Neighboring Factory, Residence, Colony, Village, Water Courses, River, Schools, Hospitals, Public Places, Vegetable / Food Markets, Cross, Tall Structure, Flora & Fauna)	Population with Composition						Possible Consequence & Assessment					Types of control measure necessary	
			Day Times			Night Times			Type of Risk &effect possible	Duration of Risk	Risk Assessment			Available in the Factory	Required from outside
			Healthy	Vulnerable	Total	Healthy	Vulnerable	Total			Roof, People, Name and amount (Rs.) of property &otherEnvironment that may be effected	Frequency of the Hazard (i.e. one such incident in what time)	Acceptable Criteria		
1	Upto 900 Mtr.	Neighboring Factories	800	40	840	300	15	315	Leakage of Chlorine Gas	Max. 30 Min.	Varying with Situation	No Experience	Data not Available	Fire HydrantSystem	Self Reliance
2	1000 Mtr.	Ambheta Village	300	15	315	380	19	399	Leakage of Chlorine Gas	Max. 20 Min.	Varying with Situation	No Experience	Data not Available	Fire HydrantSystem	Self Reliance

GUJARAT FLUOROCHEMICALS LIMITED

ANNEXURE – 13: WEATHER CONDITIONS

Sr. No.	Period of Year		Wind Velocity M / Second	Wind Direction	Weather Conditions: Dry, Moist, Rainy, Cold, Hot, Stable, Unstable, stormy	Pasqual classification A to F
1	June	September	20 to 30 km/hr	SW to NE	Monsoon Moist, Rainy, 60% to over 90% RH Maximum Rainfall 200 mm per day	D
2	October	January	7 to 15 km/hr	SW to NE NW to SE	Cold 8 °C Min.	D, E, F
3	February	May	7 to 14 km/hr in normal condition Max. 28 km/hr	SW to NE NW to SE	Dry, Hot 44 °C Maximum	E,F



WINDROSE DIAGRA

GUJARAT FLUOROCHEMICALS LIMITED

ANNEXURE - 14 & 15: INCIDENT CONTROLER

GABC.	TFE-1	Mr. C L Prasad Mr. Jagdish Bharwad	GM AGM	B.E B.E	8290 8157	Bharuch	5108 5248	9998214676 9737255598	Mr. Irfan Shaikh	Bharuch	9904825 080
GABC	TFE-2	Mr. C L Prasad Mr. Jagdish Bharwad	GM AGM	B.E B.E	8290 8259	Bharuch	5108 5248	9998214676 9737255598	Mr. Hemant Patel Mr. Chirag patel Mr. Jayant Bid Mr. Peter Katara	Bharuch	9879677928 9033981760 9033862014 7203865755
GABC	CMS	Mr. D K Singh Mr. R S Kushwaha	Sr. Gm Chief Manager		8131 8123	Bharuch	5109 5228	7046008512 9904061800	Mr.Santosh Dimri Mr. Jayesh Patel	Bharuch	8238064693 9974878862
GABC	CA	Mr. Pradeep Chauhan Mr. Manish Shukla Mr. Amit Rana	AGM Ass. Manager Ass. Manger	B.E B.E.	8129 8127 8127	Bharuch	5206 5213 5216	8347446969 9427518231 9429285873	Mr.Mukesh Sisodiya Mr. Sunil Pusty Mr.Kalpesh Patel	Bharuch	9574213555 9998849134 9825620988
GABC	FKM	Mr. T K Dash Mr. Jitendra Katariya	DGM Lead Engineer	B.E.	8177 8325	Bharuch	5711	9624488969	Mr.Padmar Pethenkar Mr. Santosh Patel	Bharuch	9327365295 9173863313
GABC	Mech. Chemi	Mr. Mukesh Barvalkiya Mr. Niraj Patel	AGM Manager	B.E B.E	8267 8114	Bharuch	5284	7698888227 7016826730	Mr. Yuvraj Mr. Satish Gohil Mr. Harsh Mopdi	Bharuch	8155071122 9978904915 9712947770
GABC	Power Plant	Mr. Dharmesh Rathod Mr. Dipak Pael	Sr. Manager Shift Incharge	B.E B.E	8141 8207	Bharuch	5331 5701	9825155360 9099085215	Mr. Kiran Mistry Mr. Viren Patel	Bharuch	8866016002 8866000257
GABC	CA Cl2 & EL	Mr. R.K Gupta Mr.Mahesh Kothiyal	DGM Manager	B.E	8319 8319	Bharuch	5243 5707	9924114953 9924445487	Mr.Rupesh Mahobe	Bharuch	9638334426

GUJARAT FLUOROCHEMICALS LIMITED

GABC	A & H	Mr. Mahendra Kunpara Mr. Maulik Vora	AGM Ass.mgr	B.E B.E	8299 8314	Bharuch	5815	8238040802 9879669036	Mr. Mikul Patel Mr.Rakesh Sankhyan	Bharuch	988285042 9574444772
GABC	Inst. Poly	Mr. D L Patel Mr. Amit Gamit	Manager Shift Engineer	B.E B.E	8265 8273	Bharuch	5358 5366	9904339979 7202031329	Mr. Divyesh Vora Mr. Nikul Patel	Bharuch	9904499972 8270
GABC	Inst. Chem.	Mr. Yogesh Badresiya Mr. Vikas Das	Manager Shift Engineer	B.E B.E	8101 8101	Bharuch	5360	8128991930 9913213782	Mr. Jayendrasin Rana	Bharuch	990996128
GABC	Electri. Chemi	Mr. Sunil Das Mr. Ashok Parnami Mr. Shirin G Patel	Sr. Eng. Ele. Eng. Ele. Eng.	B..E B.E. Dip.	8412 8161 8161	Bharuch	5380 5801 5340	7203017405 9428721595 9825311773	Mr. Jigar Patel Mr. Dhiren Pandya	Bharuch	9687378580 7046277710
GABC	Electri. Chemi	Mr. M.P. Singh Mr. Virendra Kathvadiya Mr.Prakash Kumar	DGM Shift Engineer Shift Engineer	B.Tech B.E.	8115 8516 8116	Bharuch	5383	7046055509 8128989663 9924140983	Mr. Tappan Joshi Mr. Nikhil Shing	Bharuch	9558805446 9427583034
GABC.	Mech. Poly	Mr. R. P .Chandarana Mr. Dhaval Patel Mr. harsit ctoriyawal	Sr. Manager Shift Engineer Shift Engineer Shift	B.E B.E B.E	8439 8470 8505	Bharuch	5354	8140711177 9601938125 7990854669	Mr. Prakash Ainani Mr. Dhaval Kher Mr. Jatin Bhatiya	Bharuch	7359810999 8511685515 9998960784
GABC.	S—PTFE	Mr. Milay Dani Mr. Dipti Ranjan Sahoo	GM Ass. Mgr	B.E	8175 8547	Bharuch	5275	9624702288 9737730540	Mr.Kiran Katpiswala Mr.,Shailendra Rathod	Bharuch	9825305325 9979897758
GABC.	D-PTFE	Mr. Sandep Tarafdar Mr. Hiten Shah	GM Mgr	B.E	8321 8226	Bharuch	5129 5231	985275980	Mr. Devidah Chaudhary	Bharuch	9924357145
GABC.	VDF	Mr. Ranit Singh Mr. Abid Husain	GM AGM	B.E B.E	8201	Bharuch	5146 5125	9081810110 7211108754	Mr. Ravi Rajuliya Mr. Het patel	Bharuch	8309011772 8238063725

GUJARAT FLUOROCHEMICALS LIMITED

ANNEXURE – 16: SITE MAIN CONTROLLER

Sr. No	Site Main Controller				
	Name in priority order	Designation	Place of availability		Phone No
			In the Factory	Residence Address	In the Factory
1	Mr. Sanath Kumar	Executive President Operation	ADM. Building.	Bharuch	8009
2	Mr. Sanjay Bhan	VP - Polymer	S-PTFE	Bharuch	8290

ANNEXURE - 17 (A): GUJARAT FLUOROCHEMICALS LIMITED - KEY PERSONNEL

Sr. No	Site Main Controller					Runner		Phone No.
	Name in priority order	Designation	Place of availability		Phone No	Name and Designation	Place of availability	
			In the Factory	Residence Address	In the Factory			
1	Mr. Sanath Kumar	Executive President Operation	ADM. Building.	Bharuch	8009	Mr. Atul Borange	CES Building	8450
2	Mr. Sanjay Bhan	VP – Polymer	SPTFE First Floor	Bharuch	8290	Mr. Munish Mehta	SPTFE First Floor	8485
3	Mr. Pramod Jain	Head Engineering	CES Building	Bharuch	8484	Mr. N I Doshi	CES Building	8304
4	Mr. Rajiv Sharma	CCO - Purchase	ADM. Building	Baroda	8013	Mr. Bharat Khunt	Purchase Building	8040
5	Dr. Sunil Bhatt	Head - HR	ADM. Building	Bharuch	8005	Mr. Anand Swaroop	HR Building	8300
6	Dr. Sharad Potghan	Head - HSEF	OHC Building	Bharuch	8090	Mr. Kiran Patel	HSEF Building	8095

GUJARAT FLUOROCHEMICALS LIMITED

ANNEXURE - 17 (B):GUJARAT FLUOROCHEMICALS LIMITED – ERT TEAM

Name	Designation	Department
ABHISHEK SACHAN	SENIOR OPERATOR	FI PLANT
AJAY BAVALIYA	SENIOR OPERATOR	FI PLANT
PATEL SWAPNILKUMAR UDDHAVBHAI	Lead Engineer	HSEF
NARESH SHIVABHAI PARMAR	Senior Officer	HSEF
HET PATEL	ENGINEER - POLYMER	VDF/R225
SWAPNIL PATEL	LEAD OPERATOR	VDF/R225
JATIN PATEL	PLANT OPERATOR	VDF/R225
RAJESH M PATEL	LEAD OPERATOR	FKM
URVISH S. PATEL	ENGINEER - CMS	CMS PLANT
ABHIJEETSINH M. VAGHELA	ENGINEER - CMS	CMS PLANT
HARSH KOTHARI	ENGINEER - (CHEMICAL)	CMS PLANT
HARSH S DAVE	LEAD ENGINEER	MECHNICAL (CHEM)
RAJEEV M.K. NAIR	ASSISTANT SUPERVISOR	MECHNICAL (CHEM)
ALPESH A RAJ	SENIOR TECHNICIAN	MECHNICAL (CHEM)
HARESH B AHIR	PLANT OPERATOR (POLYMER)	FKM
GIRISH M VAIDYA	ASSISTANT SUPERVISOR	FKM
SHYAM D. CHAVDA	BOILER OPERATOR - CPP	CPP
YASH H. PAUN	ENGINEER - CMS	CMS PLANT
URVISH S. PATEL	ENGINEER - CMS	CMS PLANT
HEMANT KUMAR	LEAD CHEMIST	New Polymer (PVDF,PFA/FEP,ADDITIVES)
NISHOO D. SACHAN	SENIOR OPERATOR	PTFE
RITESH KUMAR	SENIOR CHEMIST	New Polymer (PVDF,PFA/FEP,ADDITIVES)
MAHENDRABHAI S. BARIYA	JUNIOR OPERATOR	PTFE
JIGAR T. PATEL	PLANT OPERATOR (POLYMER)	PTFE-D
BHAVESH J PATEL	SENIOR CHEMIST - QA/QC	QA/QC - PTFE
SHREERAM Y LEEHE	ENGINEER	DPTFE - 8th /9th reactor
RAKESH RATHVA	PLANT OPERATOR - POLYMER	DPTFE - 8th /9th reactor
MURLI M BARPANDE	LEAD OFFICER - HSE & ENV.	ETP
HARESH Z PATEL	ASSISTANT SUPERVISOR	ETP
PRAKASH M MOTWANI	CHEMIST	QA - CENTRAL LAB
RAVINDRASINH P. RAJ	LEAD CHEMIST	QA - CENTRAL LAB
SAGAR PATEL	ENGINEER	DPTFE - 08th/09th Reactor
ALPESH T. MACHHI	ENGINEER	DPTFE - 8th /9th reactor
ANKIT KUMAR V. PATEL	JUNIOR PLANT OPERATOR - POLYMER	PVDF
BHAVIN PITHVA	SENIOR OPERATOR	PVDF
HARSHIT N. GAJERA	PLANT OPERATOR - POLYMER	VDF/R225
ANKITKUMAR RI SHAH	SENIOR OPERATOR	TFE-2
MIHIR F PATEL	ASSISTANT SUPERVISOR	PTFE
TABREZKHAN F PATHAN	SENIOR ENGINEER	MECHANICAL-CPP
YUVRAJSINH HIMMATSINH CHAVDA	JUNIOR PLANT OPERATOR	VDF/R225

GUJARAT FLUOROCHEMICALS LIMITED

Name	Designation	Department
VIKEN PATEL	LEAD ENGINEER	TFE-3
KAPIL GEHLOT	ASSISTANT MANAGER (ETP)	ETP
VIKRAM B GOHIL	PLANT OPERATOR - CMS	TFE-2
BIJAYA KUMAR JENA	SENIOR PLANT OPERATOR (POLYMER)	PFA/FEP
DEVENDRA SINGH	PLANT OPERATOR	PFA/FEP
SANJAY KUMAR	PLANT OPERATOR - POYMER	TFE-1
VIKRAM B GOHIL	PLANT OPERATOR - CMS	TFE-2
SHAILESH P KACHHADIYA	ASSISTANT SUPERVISOR	A&H
BHAVESH I GOHIL	JR. PLANT OPERATOR - POLYMER	PTFE-D
MEHUL PANCHOLI	SENIOR ENGINEER	MECHANICAL-PTFE
RAVINDRA H YADAV	ASSISTANT MANAGER - PTFE	PFA/FEP
ANKIT THAKUR	OPERATOR	FKM
JIGNESH J CHAUHAN	LEAD OPERATOR	PTFE
HEMANT K PATEL	ASSISTANT SUPERVISOR	PTFE
ASHOK MISHRA	ASSISTANT SUPERVISOR	PVDF
SAURABH THANKI	SENIOR ENGINEER	VDF/R225
YOGESH P PATIL	SENIOR OPERATOR - POLYMER	TFE-3
AFJAL ANSARI	JUNIOR PLANT OPERATOR - POLYMER	FKM
SURESHBHAI M VASAVA	SENIOR TECHNICIAN	MECHANICAL-PTFE
ANKITKUMAR RAJENDRABHAI SHAH	SENIOR OPERATOR	TFE-2
HITESHBHAI V PATEL	SENIOR OPERATOR	TFE-2
SHABHAN KHAN	PLANT OPERATOR - POLYMER	FKM
JAGDISH B. AHIR	OPERATOR	PVDF
DIGVIJASINH N. RAJ	ASSISTANT SUPERVISOR	PVDF
AKASHKUMAR K. PATEL	JUNIOR PLANT OPERATOR - POLYMER	FKM
RINIK NIZAMA	JR. OPERATOR -POLYMER	DPTFE - 8th /9th reactore
RAKESH M PATEL	SENIOR TECHNICIAN - MECHANICAL	MECHANICAL-PTFE
KINJALKUMAR G. MAKWANA	PLANT OPERATOR (AHF)	A&H
JITENDRASINH N BORASIA	SENIOR CHEMIST - QA	QA/QC - PTFE
HARSH KOTHARI	ENGINEER - (CHEMICAL)	CMS PLANT
UTSAV VIPULKUMAR GANDHI	ENGINEER -CMS	CMS PLANT
CHANDRAKANT R JADAV	SUPERVISOR	CMS PLANT
DEVENDRA G PATEL	SUPERVISOR	CMS PLANT
SUHEL I AGHAM	SUPERVISOR	PTPTFE
NAGENDRA SINGH	CHEMIST - Q.A/Q.C	QA/QC - PTFE
ASHVIN GOHIL	JUNIOR OPERATOR - PRODUCTION (CMS)	CMS PLANT
HARDIPSINH P. PARMAR	JUNIOR OPERATOR	PTPTFE
VIJAY MISTRY	PLANT OPERATOR - CMS	CMS PLANT
BHARAT A MARATHE	ASSISTANT SUPERVISOR	PTFE-D
SANJIV B MAKASANA	SENIOR ENGINEER	CMS PLANT

GUJARAT FLUOROCHEMICALS LIMITED

Name	Designation	Department
HRISHIKESH NATH	SENIOR ENGINEER	QA/QC - PTFE
CHETAN N JANI	CHEMIST - Q.A/Q.C	QA/QC - PTFE
JUGENDRA SINGH	OPERATOR - POLYMER [DAHEJ]	VDF/R225
KUNJAN ASHVINBHAI MODI	JUNIOR ENGINEER - POLYMER	VDF/R225
AKSHAY D. PATIL	PLANT OPERATOR - POLYMER	VDF/R225
MANTU KUMAR SAH	SUPERVISOR - ETP	ETP
BHATT NIKUNJ MAHESHBHAI	ENGINEER - PPC	PPC COMPLEX
RAKESH PARMAR	SENIOR OPERATOR	UTILITY
RAHUL A. MEHTA	SENIOR OPERATOR	UTILITY
PATEL HEMANTKUMAR	ENGINEER	ELECTRICAL - DAHEJ B
DHRUV DIVYESH KUMAR	ENGINEER	PRODUCTION - FKM
PRITAM BASU	ENGINEER	ELECTRICAL - POLYMER
PATIL RAKESH RAGHUNATH	Senior Technician	ELECTRICAL
VRAJ PATEL	JR. ENGINEER	MECHANICAL - MAINTENANCE
PALIWAL NARENDRA MODILAL	SENIOR MANAGER	INSTRUMENT
ROHAN PATEL	SUPERVISOR	PRODUCTION - MP
RAVI SURTI	GET	CIVIL
ARVIND KUMAR	OPERATIONS	PRODUCTION - MP
ISTIYAK AHMED	OPERATIONS	PRODUCTION - MP
DHARMENDRA KUMAR SINGH	Senior Engineer	MECHANICAL
NARESH SHIVABHAI PARMAR	Senior Officer	HSEF
SHAILESH C. GOHIL	LEAD OPERATOR	PTFE
ARPIT VISHNUBHAI PATEL	OPERATOR	PTFE
MANISH KUMAR CHAUDHARY	SENIOR OPERATOR	PTFE
KHIJARALI G MOMIN	ASSISTANT SUPERVISOR	PTFE
YOGESHKUMAR J PATEL	LEAD OPERATOR	PTFE-D
KARTIK VAGHASIYA	PLANT OPERATOR - FI	FI PLANT
RAJESH KUMAR	ASST. SUPERVISOR	FI PLANT
ASHOK I DESHANNAVAR	ASSISTANT SUPERVISOR	ELECTRICAL-CPP
GULAB D RAMRAJE	SUPERVISOR - ELECTRICAL	ELECTRICAL
MALKESH MACHHI	SENIOR OPERATOR	FKM
JAYDEEPSINH DABHI	OPERATOR - POLYMER [DAHEJ]	VDF/R225
MAYANKKUMAR V. SHAH	ENGINEER - POLYMER	VDF/R225
PRATIK MISTRY	Jr. PLANT OPERATOR - CACL2 PLANT	CACL2
SANJAYKUMAR R MEWADA	ASSISTANT SUPERVISOR	VDF/R225
ALPESH S KESARIA	SUPERVISOR	CACL2
ROHIT MISHRA	ASSISTANT SUPERVISOR - FI	FI PLANT
ALOK TRIPATHI	ENGINEER - FI PLANT	FI PLANT
JITENDRA P. PATEL	LEAD ENGINEER	PTPTFE
AJAY BAVALIYA	SENIOR OPERATOR	FI PLANT

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Name	Designation	Department
VIKAS KUMAR SHARMA	ASST. SUPERVISOR	PTFE
HASMUKH M RANA	SENIOR OPERATOR - CPP	CPP
SHAILENDRASINH M RATHOD	LEAD OPERATOR	PTFE
JIGARKUMAR K. PATEL	ASSISTANT SUPERVISOR	CPP
VIJAY PRAJAPATI	ASSISTANT SUPERVISOR	FI PLANT
MOHSIN R BHATTI	SENIOR PLANT OPERATOR	CACL2
MARWADI SMIT MANOJKUMAR	ENGINEER	PFA/FEP
PATEL RUPIT JATINBHAI	ASSISTANT SUPERVISOR	PRODUCTION - FKM
HIRAPARA VARUN ASHOKBHAI	GRADUATE ENGINEER TRAINEE	PVDF
CHHATROLA R GANESHBHAI	ASST.SUPERVISOR	PFA/FEP
GAUTAM AHIR	OPERATOR	DPTFE - 8th /9th reactor
VISHAL D. JASOLIYA	ASSI.SUPERVISOR - PRODUCTION	PVDF
MEET D VAGHELA	GRADUATE ENGINEER TRAINEE	ELECTRICAL
BRIJESH KUMAR	ASST.SUPERVISOR	POLYMER
MODI ASUTOSH RAMCHANDRA	GRADUATE ENGINEER TRAINEE	PTFE
CHOTALIYA MILAN KISHORBHAI	GRADUATE ENGINEER TRAINEE	ELECTRICAL
THAKOR AMARDIPSINH	TRAINEE OPERATOR	PTFE
MUNISH MAINRAI	ENGINEER - PTFE	PTFE
SAGAR NARESHBHAI G	ENGINEER	FKM
SHIR CHIRAG DILIPBHAI	GRADUATE ENGINEER TRAINEE	FKM PLANT
CHADDARWALA PARTH D	GRADUATE ENGINEER TRAINEE	FKM
SHIV KUMAR VERMA	SENIOR ENGINEER	FKM
NAGESH SINGH	ASST.SUPERVISOR	PFA/FEP
Gor Jigar Pankajkumar	ASST.SUPERVISOR	PFA/FEP
SANJAY V PATEL	PLANT OPERATOR (PROD.)	PVDF
ARAVIND KUMAR	ASS. SUPERVISOR - POLYMER	PVDF
DILIPSINH JADEJA	CHIEF MANAGER - ADMIN	ADMIN
RAVAL SAURABH GIRISHKUMAR	GRADUATE ENGINEER TRAINEE	ELECTRICAL
MAKADIA B JITENDRABHAI	SR.ENGINEER	CMS
KHUNT BRIJESH HARSHADBHAI	GRADUATE ENGINEER TRAINEE	CMS PLANT
BAMBHANIYA HASMUKH PI	GRADUATE ENGINEER TRAINEE	CMS
NISHANT ANILBHAI RANA	GRADUATE ENGINEER TRAINEE	PFA/FEP PLANT
RAJ VISHVAJITSINH VIKRAMSINH	GRADUATE ENGINEER TRAINEE	D-PTFE PLANT
SONI DARSHANKUMAR P	GRADUATE ENGINEER TRAINEE	MECHANICAL - POLYMER
PATEL AKASH ARVINDBHAI	GRADUATE ENGINEER TRAINEE	MECHANICAL [CHEMICAL]
RANJEETKUMAR R YADAV	PLANT OPERATOR - PTFE	QA/QC
RAVIKUMAR D. PATEL	TECHNICIAN	APTFE
MACHHI VISHALKUMAR R	ENGINEER	MECHANICAL-PTFE
AMIT KUMAR VISHWAKARMA	ASST. SUPERVISOR	PFA/FEP

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Name	Designation	Department
RAGHUVIRSINH K. SOLANKI	J. TECHNICIAN - MECHANICAL	MECHANICAL-PTFE
DIPAK KUMAR VASAVA	SR.ENGINEER	PRODUCTION - FKM
RAJ RAJPALSINH RANJITSINH	ASST. SUPERVISOR	POLYMER
PATEL RUPIT JATINBHAI	ASSISTANT SUPERVISOR	PRODUCTION - FKM
CHIRAG M PATEL	SENIOR PLANT OPERATOR	PTPTFE
MIT DHARMESHBHAI PATEL	TRAINEE CHEMIST - QA/QC	QA/QC
MAHENDIALI PALSANIYA	TRAINEE CHEMIST - QA/QC	QA/QC
SINGH AAUSH BHARDWAJ PRABHAKAR	GRADUATE ENGINEER TRAINEE	VDF
Nirav Panchal	Senior Engineer	INSTRUMENT
RAJKUMAR CHAUDHARY	ASSISTANT SUPERVISOR - POLYMER [MILL OPERATIONS]	FKM - MILLING OPERATIONS
SHABHAN KHAN	PLANT OPERATOR - POLYMER	FKM
SACHIN RANA	Jr.PLANT OPERATOR - POLYMER	FKM
PATEL MITESHKUMAR HIMATLAL	OPERATIONS	PRODUCTION - FKM
SUDHIR KUMAR	ASS. SUPERVISOR - POLYMER	FKM - MILLING OPERATIONS
VISHAL PRAJAPATI	ASST. SUPERVISOR	MECHANICAL
NEEL PATEL	ENGINEER	PTFE
PATEL ASHISHBHAI B	ENGINEER	TFE
LAMBODAR PATRA	SENIOR OPERATOR	FKM
PADHIYAR NILESH JAGDISHBHAI	ASS. SUP.- PRODUCTION	PVDF
AKSHAY M. PRAJAPATI	JR. PLANT OPERATOR - POLYMER	PVDF
Milan Gadhiya	Assistant Supervisor	CA
ANJAN	CHEMIST	DPTFE
HARDIK PATEL	Assistant Supervisor	PVDF
PRASHIL DESAI	CHEMIST	APTFE
JITENDRA M. MISTARY	Chemist	QA-QC
RAKESH PARMAR	SENIOR OPERATOR	UTILITY
SANJAY KUMAR	PLANT OPERATOR - POYMER	TFE-1
RANA HIREN A	S.ENGINEER - MECHANICAL	MECHANICAL
BRIJESH KUMAR	ASST.SUPERVISOR	POLYMER
KASHINATH JANA	ASST. SUPERVISOR	FKM
KHILJI ASHIF IKBAL	ASS. SUP. - PRODUCTION	FKM
NADIM KHAN	CHEMIST (QA/QC)	QA/QC - PTFE
DIPAK T. PATIL	SUPERVISOR	FKM
MUKESH L. CHAUDHARY	ENGINEER - PTFE	QA/QC - FKM LAB
ANKIT TRIPATHI	ASS. SUP. - PRODUCTION	FKM
SUMITKUMAR R. GADARA	PLANT OPERATOR - POLYMER	FKM
ANKUSH KUMAR PIMPALE	OPERATOR	FKM
DHADUK JAYDIP MANSUKHBHAI	ASSI.SUP. - PRODUCTION	VDF
THADODA VAIBHAVKUMAR M	ASSI. SUP - PRODUCTION	VDF
VADAVIYA DHAVAL CHHAGAN	ASSI. SUP. - PRODUCTION	FKM

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Name	Designation	Department
RANA RAHUL SATISHBHAI	ASSISTANT SUPERVISOR - PRODUCTION	TFE - 3
BARAD NAITIK KUMAR KANAJIBHAI	ASSISTANT SUPERVISOR - PRODUCTION	ProjecTS
JESADIYA HARSHIL RAMESHBHAI	ASSISTANT SUPERVISOR - PRODUCTION	PVDF
RAVAT MILANKUMAR RAMNIKLAL	ASST.SUPERVISOR	PVDF
JATIN KUMAR RANA	ASSISTANT SUPERVISOR	PVDF
SANKET PATEL	Assistant Supervisor	PVDF
ABHISHEK DHARMESHBHAI RANA	ASST. SUPERVISOR	PVDF
ACHARYA PARTHKUMAR BHARATBHAI	ENGINEER - PRODUCTION	PVDF
ATIT SHAH	ENGINEER	PVDF
DILEEP SINGH	SENIOR OPERATOR	PVDF
MODI NEEL PRAVINCHANDRA	ENGINEER - PRODUCTION	PVDF
SANJAY KUMAR NAGAR	ASST. SUPERVISOR	PVDF
VAIBHAV GOPAL PATIL	SUPERVISOR - MECHNICAL DAHEJ- B	PVDF
DHRUV KUMAR MAHESHBHAI PATEL	ENGINEER - POLYMER	PVDF
PRAJAPATI HIRENKUMAR HASAMUKHBHAI	TRAINEE OPERATOR - POLYMER	PVDF
MALKHAN SINGH	SENIOR OPERATOR	FKM
PATEL JAY NAROTTAMBHAI	GRADUATE ENGINEER TRAINEE	A&H PLANT
NIKUNJ BAMBHROLIYA	ASSISTANT SUPERVISOR	A&H
PATEL VRUSHANGKUMAR	ENGINEER	A&H
KAUSHIK CHAUHAN	ASST.SUPERVISOR	DAHEJ B
PATEL URVISHKUMAR SHASHIKANT	ASST. SUPERVISOR	DAHEJ B
MEGHVADA JAMSINH BALUBHAI	ASST. SUPERVISOR	DAHEJ B
JOTVA RAJDEEPBHAI DEVSIBHAI	ASST. SUPERVISOR	DAHEJ B
MAHESH CHANDRA	CHEMIST	Monomers (TFE-1/2/3/R125/VDF)
HASRATALI M SAIYED	SENIOR CHEMIST - QA	Monomers (TFE-1/2/3/R125/VDF)
PANDYA CHANKIKUMAR	ASSISTANT SUPERVISOR - PRODUCTION	TFE-3
RUSHIKESH S. HAZARE	Assistant supervisor - Production	FKM - MILLING OPERATIONS
VAIBHAV GOPAL PATIL	SUPERVISOR - MECHNICAL DAHEJ- B	TFE - 3

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ANNEXURE – 1: EMERGENCY CONTROL CENTRE

Sr. No.	Materials kept in the Emergency Control Centre	Numbers of quantity	Person who will handle/operate this item
1	External Telephones	2 Nos.	Head HSE
2	Internal Telephones	2 Nos.	Head HR & Admin.
3	Telephone directory - Internal and External	1 No.	Head HR & Admin.
4	Wireless	2 Nos.	Head HSE
5	Map of the Site	1 No.	Head Engineering
6	Factory Layout	1 No.	Head Engineering
7	Layout showing fire hydrant / extinguishers	1 No.	Head HSE
8	Layout Showing emergency control center and assembly point	1 No.	Head HSE
9	Stock sheet of fire extinguishing material and its availability	1 No.	Head HSE
10	Muster role of employees	1 No.	Head HR & Admin.
11	Work permits book	1 No.	Head HSE
12	Gate passes book	1 No.	Head HR & Admin.
13	List of employee blood group	1 No.	Head HSE
14	Note pads, pens, pencil, rubber, stationery	Sufficient Quantity	Head HR & Admin.
15	Copy of On-site emergency plan	1 No.	Head HSE
16	Copy of Off-site emergency plan	5 Nos.	Head HSE
17	Torches	3 Nos.	Head HSE
18	Umbrella	5 Nos.	Head HR & Admin.
19	Raincoat	10 Pairs	Head HR & Admin.
20	Safety shoes	5 Pairs	Head HSE
21	Helmets	10 Nos.	Head HSE
22	Goggles	10 Nos.	Head HSE
23	Ear Muffs	10 Nos.	Head HSE
24	Aprons	5 Nos.	Head HSE
25	Camera with rolls	1 No.	Head HR & Admin.
26	Stop Watch	1 No.	Head HR & Admin.
27	Self-Breathing Apparatus	2 Nos.	Head HSE

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Annexure – 19: Details of Fire Fighting & Life Saving Equipments Details of Fire Fighting & Life Saving Equipment's

1. Fire Water Storage & Pumping Capacity

Fire Pumps		Fire Water		
Type of Pump	**Nos.**	**Type of Storage**	**Capacity**	**Plants Covered**
Pump House - A Electric Pump (273 m3 / Hr) Diesel pump (273m3 / Hr.) Jockey Pump (78 m3 / Hr)	03Nos. 01No. 02 Nos.	02 nos. of Water Lagoon on Ground	2500 m^3	All
Type of Pump	**Nos.**	**Type of Storage**	**Capacity**	**Plants Covered**
Pump House - B Electric Pump (273 m3 / Hr) Diesel Pump (273m3 / Hr.) Jockey Pump (78 m3 / Hr)	02Nos. 01No. 01No.	03 Nos. of FRP Tanks	508 m^3	All

2. Fire Alarm Systems

Fire alarm System				
Fire Alarm Panel	Smoke Detector	Beam Detector (OSID Imager)	Beam Detector (OSID Emitter)	Response Indicator
23	**977**	**10**	**12**	**158**

Plant wise First - Aid Fire Fighting Equipments (Fire Extinguishers, Sand Buckets Etc), SCBA & Cascade

A) Total Quantity

CO2 Fire Extinguisher		DCP/ABC Fire Extinguisher		Foam Type Fire Extinguisher		Fire Buckets
Capacity	**Qty**	**Capacity**	**Numbers**	**Capacity**	**Qty**	**Qty**
4.5 kg	450 Nos.	02 KG	159 Nos.	9 lit	1 No.	161 Nos.
		06 KG	692 Nos.	50 Lit	10 Nos.	
6.8 Kg	5 Nos.	10KG	12 Nos.	100Lit.FoamTrolley	6 Nos.	
		25 KG	1 Nos.			

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B) Plant wise Fire Extinguisher

Fire Fighting Equipments list														
Sr. No	Plant	Fire Hydrant	Fire Hose Box	Fire Hose	Fire Extinguisher	Water Monitor	TP Branch	Foam Trolley (100 Lit)	Safety Shower	SCBA Set	SCBA Cylinder trolley	Airline System	Fire Bucket	Total
1	CPP & CCGT	29	29	58	124	1	29	0	3	2	0	0	12	**287**
2	CA & CA Flaker	33	33	66	91	5	33	0	26	14	2	14	30	**347**
3	CMS	41	41	82	112	3	41	2	36	6	0	15	30	**409**
4	A&H	23	23	46	108	5	23	0	48	14	0	23	11	**324**
5	TFE-1	15	15	30	65	4	15	0	11	3	0	0	28	**186**
6	R-125/TFE-VR	10	10	20	26	1	10	0	11	1	0	1	0	**90**
7	TFE-2	16	16	32	48	4	16	0	11	3	0	1	0	**147**
8	S-PTFE/WH	21	21	42	69	0	21	0	5	5	0	0	0	**184**
9	PT-PTPTFE & WH	6	6	12	62	0	6	0	1	3	0	0	4	**100**
10	D-PTFE	10	10	20	16	0	10	0	3	2	0	0	0	**71**
11	A-PTFE	10	10	20	11	2	10	0	2	0	0	0	0	**65**
12	SR-1/2	2	2	4	30	0	2	0	3	1	0	0	4	**48**
13	8/9TH REACTOR	7	7	14	38	0	7	0	2	2	0	0	4	**81**
14	FKM & S&A	15	15	30	57	0	15	0	5	3	0	0	0	**140**
15	VDF	18	18	36	12	4	18	2	12	4	0	0	24	**148**
16	R-225	9	9	18	16	0	9	0	7	1	0	0	0	**69**
17	PVDF	5	5	10	30	0	5	0	1	2	0	0	0	**58**
18	TFE-3	13	13	26	18	2	13	0	11	0	0	0	8	**104**
19	CU	5	5	10	32	0	5	0	3	2	0	0	0	**62**
20	FI	13	13	26	62	3	13	0	8	3	0	6	12	**159**
21	PFA/FEP	0	0	0	0	0	0	0	10	1	0	0	0	**11**
23	Micropowder	0	0	0	7	0	0	0	0	0	0	0	0	**7**
24	ETP	0	0	0	12	0	0	0	2	1	0	0	0	**15**

25	OLD CACL2	0	0	0	6	0	0	0	2	1	0	0	0	**9**
26	STORE	0	0	0	3	0	0	0	0	0	0	0	0	**3**
27	HSE &OHC	0	0	0	8	0	0	0	2	0	0	0	0	**10**
28	ADM. &CANTEEN	0	0	0	5	0	0	0	0	0	0	0	0	**5**
29	GFRC	0	0	0	4	0	0	0	2	0	0	0	0	**6**
30	New CaCl2	1	1	2	0	0	1	0	2	2	0	0	0	**9**
31	All Gates	0	0	0	3	0	0	0	0	0	0	0	0	**3**
32	TFE DMA	2	2	4	5	0	2	0	1	2	0	0	0	**18**
33	DPMP Warehouse	2	2	4	5	0	2	0	0	0	0	0	0	**15**
34	Chemical Store	2	2	4	5	0	2	0	0	0	0	0	0	**15**
35	A-PTFE Warehouse	1	1	2	5	0	0	0	0	0	0	0	0	**9**
36	Kilo Lab	2	2	4	4	0	2	0	1	0	0	0	0	**15**
		311	**311**	**622**	**1099**	**34**	**310**	**4**	**231**	**78**	**2**	**60**	**167**	**3229**

3. GAS DETECTION SYSTEM

FIXED	PORTABLE (DIGITAL)
Cl2 Fixed Sensor - 27 Nos.	Oxygen Meter - 10 Nos.
Hydrogen Fix Sensor - 02 Nos.	LEL Meter - 35 Nos.
HCL Detector - 02 Nos.	Cl2 Meter - 06 Nos.

Fire Tender Detail:-

Multi Purpose Tender

- Chassis:
  TATA chassis with cabin.
- **Superstructure:**
  MS/SS pressed sections, square pipes, angles etc.
- **Pump Type:**
  Single or double stage centrifugal type rear mounted.
- **Pump Capacity:**
  L.P- 2250 LPM at 7-8.5 kg/cm^2 at suction lift of 7 meters.
- **Power Takeoff:**
  With full torque power take off.
- **Monitor:** One monitor with suitable branch is provided on the top of the foam tender, which can rotate 360° in horizontal plane and 45° in vertical plane, however guided by dimensions of the body.
- **Water Tank:** 3000 liters capacity made from 3-5mm thick SS plates.
- **Foam Tank:** 1000 liters capacity made from 3-5mm thick MS/SS plates.
- **DCP System**: 500 Kg capacity

- **Lockers:** Lockers on both sides of the body with lids suitably hinged and closing device with quick release couplings, brackets, clamps are provided. Aluminum roller shutter/door on either side for storage of equipment is provided. Conforming to IS:10460

Emergency Response Vehicle (Mini fire Tender)

- Chassis:
  ISUZU DMEX chassis with cabin.

Water Tank Capacity	500 litres
Material	SS 304 sheet
Manhole	100 mm diameter
Foam Tank Capacity	100 litres
Material	SS 304 sheet
Manhole	75 mm diameter

Pump system: -

Ultra-high-pressure pump

Manufacturer and type	Udor ultra high pressure
Performance	38 LPM at 100 Kg/Cm^2
Material	Gun metal
Rotating direction seen from front of pump	Counter clockwise
Drive	Petrol Operated Engine
Control panel	Pressure gauge
	Water tank to pump valve
	Hose reel valve
	Throttle wheel
	Foam tank to pump valve
	Auxiliary foam pickup valve

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ANNEXURE – 20: MEDICALARRANGEMENTS & LIST

For key personnel and essential workers see Annexure – 17 and 18									
First-aid Centers / Ambulance room / OHC / Hospital									
Sr. No.	Name and location	Tele. Nos.	In charge person			Facilities and Equipment	Antidotes available	First aiders available	Accommodation
			Name and Designation	Residence					
				Phone	Address				
1	2	3	4	5	6	7	8	9	10
1	Occupation Health Center	02641-618085	Dr. Mehul Rahevar [FMO] Dr. Devang Yadav (FMO)	9714178885 9737117744	Bharuch. Bharuch	Doctor room Emergency room Dressing Room Recovery Room 4 Patient Bed Decontamination Area Audiometry Cabin 2 Ambulances Central Oxygen Line Separate Oxygen Cylinders ECG Machine PFT Machine Audiometry Machine Vision Test Suction Machine	Inj. Calcium Gluconate Calcium Jelly Prevor Anti HF Kit Inj. Atropine Inj. Hydrocortisone Tab. Activated Charcoal Inj. Sodium Bicarbonate Milk Of Magnesia Anti Snake Venom Inj. Rabipur Inj. Tetanus Toxoid	6 Male Nurses 1 Female Nurse • Prajapati Alpesh • Ishwar bhai • Abdulrahema Gamgori • Ravi Jogadiya • Dharmendra Pateliya • Pradip Chaturvedi • Pratik Parmar • Richa Shelat	Recovery room with 4 no. of bed Emergency room with 1 no. of bed Doctor room with 1 no. of patient examination table Dressing room with 1 no. of patient examination table

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ANNEXURE – 20: MEDICALARRANGEMENTS

For key personnel and essential workers see Annexure – 17 and 18			
Ambulance van of alternate arrangement			
Place of availability	Capacity	Facilities in the van	Drivers Name and Address
11	12	13	14
Near By Occupation Health Center	2 No. of Ambulances One is big ambulance with full ICU Equipment for reference of patient to higher center One small Ambulance used with in plant area	Big ambulance has Multipara Monitor, Defibrillator, oxygen cylinders, suction machine, hydraulic stretcher, spine board ,wheelchair , freeze ,inverter to run dc medical equipments, flood lights & announcement , mic system	1] Mr. Kamlesh Bhai Mob No:8200138863 Address: Nikora, Bharuch 2) Manoj Padhiyar Mob ;9099747610 Dharamsala, Dist.: Bharuch 3) Mr. Manhar Patel Mob. No: 7016326544 Eksal C. Mr. Narsinh Mob. No: 8200138863 Kalla D. Mr. Viral Limchiya Mob.: 9724663997 Dahej E. Mr. Ashok Parmar Mob: 81405327481 Detral

For key personnel and essential workers see Annexure – 17 and 18					
Doctors (all near by)			Other medical staff		
Name, Address and phones	Residence		Name, Address and phones	Residence	
	Phone Nos.	Address		Phone Nos.	Address
15	16	17	18	19	20
Dr. Mehul Rahevar [FMO] Dr. Devang Yadav (FMO)	9714178885 9737117744	Bharuch. Bharuch	Prajapati Alpesh Ishawarbhai Abdulrahema Gamgori Ravi Jogadiya Dharmendra Pateliya Pradip Chaturvedi Pratik Parmar Richa Shelat	9725521735 9662031701 9898189411 6351519830 9672134626 9737066623 8511612696	Rahadpor Nabipur Bharuch Bharuch Bharuch Palej Bharuch

ANNEXURE – 20: MEDICAL ARRANGEMENTS

For key personnel and essential workers see Annexure – 17 and 18									
Mutual Aid Arrangements									
Name and address of the factories and Hospitals	Approx. Distance	Contact		Facilities available					
		Person	Phone Nos.	Accommodation	Doctors	Other Staff	Equipments	Antidotes	Ambulance van
21	22	23	24	25	26	27	28	29	30
Reliance Industries Ltd	3 KM	Dr. Paren Shah	9998987298	YES	YES	YES	YES	YES	YES
BASF	4 KM	Dr. Mehul Dewasai	8460466603	YES	YES	YES	YES	YES	YES
Birla Copper	5 KM	Dr. Manjuben	9904705986	YES	YES	YES	YES	YES	YES
Torrent Pharma	6 KM	Dr. Jadeja	7096408013	YES	YES	YES	YES	YES	YES

GACL	2 KM	Mr. Himanshu Parekh (HR)	9099070333	YES	YES	YES	YES	YES	YES
OPAL	8 KM	Dr. Bhaumik Acharya	7433944816	YES	YES	YES	YES	YES	YES
Indofil	8 KM	Dr. Himanshu Vanza	9824143883	YES	YES	YES	YES	YES	YES
SRF	7 KM	Dr. Ripal	7283877967	YES	YES	YES	YES	YES	YES
DHWS HOSPITAL, DAHEJ	3 KM	Reception	02641290800,1,2	YES	YES	YES	YES	YES	YES
AMAX HOSPITAL, JOLWA	7 KM	Dr. Mahinath Mishra	9327703283	YES	YES	YES	YES	YES	YES
GNFC Dahej	14 KM	Dr. Tushar Lalavia	9909904617	YES	YES	YES	YES	YES	YES
HEALING TOUCH HOSPITAL	45 KM	Dr. Sarad Kothari	9825306787	YES	YES	YES	YES	YES	YES
APEX HOSPITAL	44 KM	Mr. Ketal Doshi	9825027016	YES	YES	YES	YES	YES	YES
OPRCHID HOSPITAL	44 KM	Mr. Kiran Purohit (Admin)	9428617762	YES	YES	YES	YES	YES	YES
BHARUCH ORTHOPADIC HOSPITAL	45 KM	DR. ABHISHEK DARJI	2642243800	YES	YES	YES	YES	YES	YES
GLOBAL HOSPITAL, BARODA	130KM	Mr. Satyam	8469880808	YES	YES	YES	YES	YES	YES
STERLING HOSPITAL, BARODA	140 KM	Mr. Deepak (Admin)	2652354455	YES	YES	YES	YES	YES	YES
7X Multi speciality hospital	**45Km**	Mr. sanket shah	9824143278	YES	YES	YES	YES	YES	YES

GUJARAT FLUOROCHEMICALS LIMITED

ANNEXURE – 21: TRANSPORT AND EVACUATION ARRANGEMENTS

For Key personnel please see Annexure 17 and for Assembly points please see Annexure 18.

Type of siren, if any, for evacuation

Own Transport					Own				
Sr. No.	Name and Location	In-charge Person			Sr. No.	Type and No.	Capacity	No. and type of public warning instruments	Driver's Name and address
		Name and designation	Residence						
			Phone	Address					
1	Jamadar travels (Bharuch)	Mr.SumitGaura v/ Sohel Jamadar	8451/ 90995 72851	Dahej/ Bharuch	01	9 Bus for General Shift & 6 Bus for other shifts	02 Nos. of AC Bus 51 Seater 07 Nos of Non AC Bus - 56 Seater	___	____

Outside shelters for evacuated persons

Sr. No.	Name, address and distance		Phone Nos.	In-Charge Person			Accommodation capacity	Facilities available
				Name and designation	Residence			
					Phone	Address		

Mutual Aid Arrangements

Sr. No.	Name and address of the factories and outside transport centers including Bus	Distance	Phone No.	In charge Person			Vehicles available		
				Name and designation	Residence		Sr. No.	Type and No.	Capacity
					Phone	Address			
1	OM Travels, Bharuch	45 Km	9924428289	Mr. Mauyer Bhai	02642 - 241921	Bharuch	1	05 Nos Swift Desire	03 Seater
2	Shriji Travels	47 Km	9099973631	Mr. Jayesh Patel	02642 - 232366	Bharuch	2	TUV-300 01 nos and ciaz-03 nos	08 seater TUV& 03 seaterCiaz

3.	Asha Travels	47 KM	7016108520	Moshin Bhai	7016 1085 20	Bharuch	3	ZEST-8 ALTIS-2	03 seater
4	Shree Rang Krupa	50 KM	9824590366	Pravins inh Rana	9824 5903 66	Bharuch	4	TampoT raveller	20 seater
5	Bansari Travels	50 km	9558234030	Nilesh Bhai	9558 2340 30	Bharuch	5	Innova Crysta	05 Seater

GUJARAT FLUOROCHEMICALS LIMITED

ANNEXURE – 22: ALARMS AND SIRENS

Sr. No.	Plant-wise alarm points							alarm (signal) is heard
	Plant/Dept. /Location	Sr. No. of the alarm point	Its place Of location (with floor No. if any)	Type of the alarm or siren			Its period of checking	
				In case of emergency	All clear	Testing		
1	2	3	4	5	6	7	8	9
1	Fire and Safety Building	Fire and Safety Building (01)	On Terrace	30 Sec ON 15 Sec. OFF for 3 min.	Continuous 2 Min	Continuous 2 Min	Weekly (Every Wednesday)	Heard up to 8000 Mtr. Radius
2	TFE - 1	Control Room Building (02)	On Terrace	30 Sec ON 15 Sec. OFF for 3 min.	Continuous 2 Min	Continuous 2 Min	Weekly (Every Wednesday)	Heard up to 400 Mtr. Radius
3	CMS	Control Room Building (03)	On Terrace	30 Sec ON 15 Sec. OFF for 3 min.	Continuous 2 Min	Continuous 2 Min	Weekly (Every Wednesday)	Heard up to 400 Mtr. Radius
4	CA Control Room	Control Room Building (04)	On Terrace	30 Sec ON 15 Sec. OFF for 3 min.	Continuous 2 Min	Continuous 2 Min	Weekly (Every Wednesday)	Heard up to 400 Mtr. Radius
5	Chlorine Storage Vessels	Operator Building (05)	On Roof	30 Sec ON 15 Sec. OFF for 3 min.	Continuous 2 Min	Continuous 2 Min	Weekly (Every Wednesday)	Heard up to 400 Mtr. Radius
6	Power Plant	CCGT Office (06)	On Terrace	30 Sec ON 15 Sec. OFF	Continuous 2 Min	Continuous 2 Min	Weekly (Every Wednesday)	Heard up to 400 Mtr.

GUJARAT FLUOROCHEMICALS LIMITED

ANNEXURE – 23: INTERNAL PHONES & ABBREVIATED DIALLING LIST

Intercom List		
NAME	**INTERCOM**	**ABB. NO.**
EXECUTIVES		
Mr. Sanath Kumar	8009	5100
Mr. Sunil Bhatt	8005	5105
Mr. Rajiv Chauhan	8071	5106
Mr. Rajiv Sharma	8013	5107
Dr. Sharad Potghan	8090	
Mr. Sanjay Bhan	8193	5134
Mr. Rakesh C. Shah (Executive)	8306	5115
HSEF		
Mr. Jayesh Jani	8549	
Mr. Kiran Patel	8095	
Mr. Dharmendra Doctor	8080	
Mr. Jikar Malek	8081	
Fire Station	8084/8096	5931
Mr. Rajendra Patil	8163	5768
Dr. Mehul Rehvar / Dr. Devang Yadav	8085	
Mr. Harsh Modi	8080	
Mr. Shivam Pandya / Mr. Chirag Valand	8080	
OHC	8088	
Ms. Rupal Patel / Ms. Shraddha Sunva	8550	
HR & ADMIN		
Mr. Anish Maheta	8014	
Mr. .Anand Swaroop	8300	
Mr. Prashant Yadav	8010	5218
Mr. Nainesh modi	8011	
Mrs. Varsha Gusain	8083	
Mrs. Rachana Panchal	8449	
Mr. Yogesh Dolar	8530	
Mr. Pragnesh Patel	8025	5219
Mr. Dilipsinh Jadeja	8236	
Mr. Haricharan Gurjar	8288	
Mr. Manoj Malik	8451	
Mr. Mayur Vaghela (Medical)	8067	
Ms. Ruchi Shukla	8540	
Time Office	8082	
Ms. Nilu Khandelwal	8592	
IT	8021	5112
Mr. Kaushik Yadav	8575	
Mr. Shyamal Thakkar	8024	5411
Mr. Deepak Vasava (IT Room)	8048	5540
Mr. Umesh Chaudhari (IT Room)	8048	5412
Mr. Ankit Vaghela (IT	8048	5415

Room)		
COMMERCIAL - PURCHASE		
Mr. Bharat Khunt	8040	5113
Mr. Sameer Saxena	8240	5421
Mr. Dulal Dutta	8047	
Mr. Rakesh Kothari	8486	5806
Mr. Yashpal Gohil	8045	
Mr. Hitesh Sutariya	8044	
Mr. Mitesh Kalgiwala	8059	
Mr. Kamlesh Gohil	8043	
Mr. Karan Solanki	8050	
Mr. Vijay Parmar	8230	
Mr. Dinesh Gohil	8049	
Mrs. Anita Desai	8026	
Mrs.Ritu sharma	8361	
Mr. Hunaid Ankleshwaria	8033	
Ms.Aparna Agnihotri	8537	
Mr. Prashant Chaudhary	8536	
Ms.Freny Chauhan	8046	
COMMERCIAL - STORE		
Mr. Amiya Oza	8328	5208
Mr. YN Patel	8055	5742
Mr. Rajesh Parikh	8054	5743
Mr. Rajendra Chauhan	8052	
Mr. Kiran Patel	8051	5555
Mr. Uday Chaudhari	8034	
Mr. Dharmesh K Gohil	8029	
Mr. Jasmin Pandya	8039	5999
Mr. Pravin Patel	8241	
Mr. Sandip	8362	
Store	8209	
COMMERCIAL - LOGISTIC		
LOGISTIC	8065	
Mr. Shailesh Dixit	8231	5452
Mr. Bhavin Modi	8042	
Mr. Ravi Baria	8042	
Mr. Upendra Rathod	8232	
Mr. Sudeep Solanki	8060	
TECHNICAL SERVICE		
Mr.Atul Burange	8450	5110
Mr. Nitin Chaudhary	8027/8021	5450
Mr. Suresh Babu	8176	
SSM	8332	5905
Mr. Nitesh Makeshwer	8332	5905
Mr. Bhusan Patil	8332	
Mr. Amol Shinde	8332	
NAME	**INTERCOM**	**ABB. NO.**

POWER PLANT		
Mr. Mukesh Jain	8146	5111
Mr. Sunil Jain	8206	9926122422
Mr. Dharmesh V Rathore	8302	5331
Mr. Kanu Bharwad	8142	5379
Mr. Hardik Baroth	8141	5624
CA/Control room		
Mr. Pradeep Chauhan	8129	5206
Mr. Ashok Kumar Singh	8180	5400
Mr. Amit Rana	8126	5216
Mr. Kalpesh Patel	8126	5216
Mr. Manish Shukla	8130	5213
CMS PLANT		
Mr. Dinesh Singh	8131	5109
Mr. S J Pandian	8111	9924511477
Mr. RS Kushwaha	8123	5228
Mr. Lallan Singh	8108	5230
Mr. Vipin Kumar Singh	8132	5232
Mr. Jayesh Patel	8102	5245
Mr. Santosh Dimri	8102	5241
Mr. Sanjay Patel	8291	5244
Mr. Sidiki		
CaCl2/Co2/ GRANULATOR PLANT		
Mr. Rajkumar Gupta (HOD)	8028	5207
Mr. Mahesh K Kothiyal	8319/8316	5243
Operator old Cacl2	8291	5464
TFE PLANT		
Mr. C L Prasad	8290	5108
Mr. Jagdish Bharwad/Irfan TFE-1	8157	5248
Mr. Abidhusen-TFE-3	8420	5125
Mr. Jayant Bid-TFE-3+ Mech	8420	
Mr. VIREN PATEL - TFE-3	8564	
TFE-2		
Mr. Piter katara	8259	
DPTFE/APTFE PLANT/Sec. 1		
Mr. Sandeep Tarafdar	8321	5129
Mr. Munish Mehta	8485	7283888422
Mr. Pravin Kumar	8559	5299
Mr. P Subharao	8274	5281
Mr. Hiten Shah	8226	5231
Mr. Prakit desai	8276	
Mr. Jitendra Kale	8438	
PTFE PLANT		

Mr. Nilay Dani	8175	5275
Mr. Diptiranjan	8547	
Mr. Neeraj Jain	8169	5875
FKM PLANT		
Mr. Tarun Das	8177	5711
Mr. Priyank Patel	8318	
Mr. Mukesh Jagtap	8409	
Mr. Jayesh Khokharia (FKM)	8375	
VDF Plant		
Mr. Ranjeet Singh	8201	5146
PTPTFE PLANT		
Mr. Hasan Ali	8233	
Mr. Ajay B Sinha	8204	5259
Mr. Prahalad Patel	8212	
PRODUCTION PLANNING CONTROL (POLYMER)		
Mr.Kamlesh Mishra	8322	5770
Mr.Neerav Parmar	8091	
Mr.Nikuj Bhatt	8253	
A & H PLANT		
Mr. RC Shah	8306	5115
Mr. Mahendra M. Kunpara	8299	8238040802
8th 9th Reactor Plant		
Mr. Sagar Patil	8500	5258
116 m –Shreeram leehe / Common Office	8588	
108 m - Oven backside	8589	
UTILITIES		
Mr. Devendra Bute	8035	5123
Mr. Nitin Parekh	8109	5286
Mr. JR Mohanty	8164	5279
Mr. Uday Chauhan	8158	5277
Mr. Yatin Jadav	8531	
PVDF		
2nd Floor/3rd Floor Plant Area	8454/8455	
Mr. Ashok Talpade	8417	
Shift In-charge - PVDF	8330	
NAME	**INTERCOM**	**ABB. NO.**
MECHANICAL		
Mr. Nilesh Doshi	8304	5136
Mr. Kiran Chaini	8324	5102
Mr. Devidas Choudhary (APTFE)	8154	5563
Mr. Rajen Chandarana (DPTFE)	8279	5354

Mr. Prakash Ainani (TFE 1 & 2)	8250	5317
Mr. Mukesh Barvaliya (CA)	8267	5284
Mr. Pravin Kedia (PTFE)	8188	5325
Mr. Hemant modi (PTPTFE)	8577	5318
Mr. Jatin Bhatia (TFE1)	8187	
workshop/Mr.Harshit Doctorwala	8505/8506	
MR. Niraj patel (CMS)	8117	5212
Mr. Kamlesh Shah (CPP)	8371	5717
Mr. Dharmendra Rathod (CPP)	8178	5254
Mr. T. Krishnamoorthy	8587	
Mr. Kiran Chatufale (CaCl2/Co2)	8296	5821
Mr.Harsh Dave	8134	
Mech. Shift Office-TFE1	8154	
Mech. Shift Office-TFE2	8257	
Mech. Shift Office-PTFE	8154	
Mech. Shift Office-PTPTFE	8099	
Mech. Shift Office-CMS1	8114	
Mr. Sandip Raj (DPTFE)	8431	
Mech. Shift Office-CMS2	8114	
Mr.Avinash Sankhle-CA	8134	
Mech. Shift Office-CPP	8216	
Mech. Shift Office-FI	8037	
Mech. Shift Office-8th 9th Reactor	8505/8506	
FI Mech works	8580	5939
Mr.Kapildev Pandey	8374	
ELECTRICAL		
Mr. Amit Tyagi (CPP)	8148	5114
Mr. M P Singh (CA/CMS)	8115	5383
Mr. Brijesh Thakkar	8418	
Mr. Suresh Parekh (TFE 1 & 2)	8153	5375
Mr. Purvesh I Kapadia (Polymer)	8092	5715

Mr. Ankit Jain	8307	
SubStation-TFE1	8161	
SubStation-TFE2	8261	
Sub Station-PTFE	8181/8182	
Sub Station-DPTFE	8280	
Electrical-CMS1	8116	
SubStation-CMS2	8217	
Local CR-Rectifier	8128	
Sub Station-Flaker	8159	
Switch Yard	8216	
Substation-S&A	8247	
Substation-A&H	8309	
Substation-MCC Room 8th 9th	8507	
Mr. Nirav Patel (CA/CMS)	8516	
Operator office CMS-1	8121	
Operator office CMS-2	8221	
INSTRUMENTATION		
Mr.Sameer Bhuwania	8075	5351
Mr. Manoj Uppal (A & H)	8147	5175
Mr. Dattu Patel (POLYMER)	8265	5358
Mr. Ashok Ojha(PTFE)	8198	5361
Mr. Alpesh Raiyani (A &H)	8301	5407
Mr. Yogesh Badreshiya (CMS)	8101	5360
Mr. Milind Bhatagalikar (CPP)	8150	5353
Mr. Mukesh Yadav (DPTFE)	8270	5366
Mr.Yuvraj Sinh (TFE-2,3)	8521	5426
Mr.Amul Rana(TFE-2,3)	8525	
Mr.Anudeep Kadu(PTFE)	8520	
Mr.Mihir vaishnav (TFE)	8255	
Inst. Shift Office-Chemical	8101	
Inst. Shift Office-Polymer	8155	
Inst. Shift Office-CPP	8311	
CPP Instrument	8150	
Inst. A & H	8302	
Inst. DPTFE	8273	
Inst. PTFE	8265	
Inst. TFE1	8155	
Inst. 8th 9th Reactor	8503/8504	

CIVIL	8356	
Mr. Adesh Patel	8094	5392
Mr. Inderpal Singh / Mr. Bharat Prajapati	8244	5394
Dahej-B		
Mr. Mahesh Aggarwal	7211120161	
Mr. Ips Anand (Dahej-B)/Mr. Lalit Ajmera	8298	5464
MARKETING		
Mr. Himansu Tripathi	8113	5853
Mr. Niraj Bharadia	8062	5443
Mr. Sanket Mistry	8061	
CENTRAL ENGINEERING		
Mr. Manan Bhalotia	8323	5664
Mr. Rakesh Shah	8093	5663
Mr. Bimal	8227	
Mr. Ankur Desai	8557	
Central Lab		
Dr. Hitendra Jani	8295	5500
Jayeepsinh Gohil	8294	5249
Ajitsinh Gohil	8447	5223
Accounts		
Mr. Dinesh Tak	8539	
DOCUMENTATION CENTER		
Mr.Viral Modi	8016	
PROJECTS		
Mr. Anup Nair	8308	5133
Mr. Rahul Kumar	8556	
MR.YASH SHAH/MR.DHAVAL PATEL	8555	
Mr. Rahul Kumar	8227	
Inox Air Products		
Mr. Amit Shah	8124	
GFRC		
Mr. Chintan Vyas	8360	5234
Mr. Durgesh Verma	8097	5345
Dr. G S Gohil	8072	5343
Ms. Anamika	8100	
Mr. Imran	8246	5873
Mr. Shriraj Modi	8348	5817
Mr. Gaurav Verma	8349	5826
Mr. Dinesh Ardeshna (GFRC R&D)	8399	
Mr. Atham Muhajir Jawahar	8407	
Mr. Vinay Dongre	8345	
Consultant Office	8008	7211101807
GFRC Laboratory	8079	

GFRC Workshop	8069	
GFRC Conf. Hall	8070	
GFRC Library	8350	
QA/QC & LAB		
Dr. Rajesh Gupta (PTFE)	8320	5127
Mr. Narsihma Rao (DPTFE)	8199	5291
Dr. Jitendra Rathod (TFE 1)	8289	5498
Mr. Hemal Nagar	8200	
Mr. Hetal Rana /)Mr. Asimkumar (TFE)	8156	5537
Mr. Mital Doshi (SPTFE)/Mr. Mayur Patel (PTFE)	8297	5225
Mr. Kamlesh Patel (APTFE)	8162	5221
Mr. Jaydeepsinh Gohil(CA/CMS)	8294	5249
Mr.Dharmendra Pradhan	8281	
Mr. Pankaj Solanki	8078	
Mr.Suresh Lanka/Mr. Yogesh Raval(DPTFE)	8284	
Mr. Dhaval Mehta (CA/CMS)	8334	
Diptiranjan Sahu-PTFE Process	8547	
CES		
MR.DHRUVIT VALA	8227	
MR.PRATIK CHAUHAN	8558	
EP(O) OFFICE		
Mr. Sunil Nair	8003/8333	5117
IMPORTANT INTERCOM NOS.		
Reception	8031	
OHC	8088/8085	
Fire Station	8084	
Security Gate-Materials	8087	
Security Gate-Visitors	8086/8288	
Security Gate-Labour	8125	
Weigh bridge	8042/8064	
NAME	**INTERCOM**	
POWER PLANT- CPP		
Control Room-Coal	8207/8208	
Control Room-Gas	8143/8144	
Coal Gate	8568	
Control Room-CCGT	8194/8195	
COAL HANDLING PLANT OPERATOR ROOM	8591	

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CA PLANT		
Control Room	8127	
CA ELECTRICAL	8128	
HYDROGEN COMPRESSIOR	8140	
Local CR-Cl2 Bottling	8136	
Local CR-Brine Purification	8135	
NEW SALT YARD OFFICE	8590	
CA/Flaker Production		
Mr. PK Chauhan (HOD)	8106/5130	
FLAKER PLANT		
Control Room	8167/8168	
Local CR-Burner	8180	
CMS PLANT		
Control Room	8102/8103/8104/8105	
Local CR-CMS1 Refrigration	8120	
Local CR-CMS2 Refrigration	8220	
Local CR-Tanker Filling	8122	
CaCl2 PLANT		
Control Room-Liquid	8224	
FI Plant Control Room	8292	
Mr. Mahesh Kothityal	8445	
COMMON UTILITY		
Control Room	8109	
Local CR-Pump House	8112	
N2 PLANT	8124	
TFE PLANT		
Control Room-TFE1	8151/8152	
Control Room-TFE2	8251/8252	
Local CR-TFE1 Refrigration	8158	
Local CR-TFE2 Refrigration	8258	
Control Room-TFE3	8441/8442	
PTFE PLANT Cetal Area	8189	
Control Room	8171/8172/8174	
Local CR-DI Water (NOT REGISTER)	8243	
Local CR-VAM/Chiller	8205	
PTFE PLANT	8215/8202/8203	
Mr. Diptiranjan Sahu	8547	
DPTFE PLANT		
Control Room	8271/8272	
Local CR-Oven	8276	
Local CR-DI Water/Refrigration	8283	

S & A PLANT		
Mr. Mukesh Jagtap	8378/8478	
Control Room	8351/8352	
Control Room	8325	
CO2 PLANT		
Control Room	8316	
A&H PLANT		
Control Room HCFC	8314	
Mr.Ankit Jain	8446	
Mr. Maulik Vora	8315	
H2 PLANT		
Control Room	8140	
GRANULATOR		
Control Room	8063	
FKM		
Control Room	8351/8352	
Shift Enginneeer	8325	
ETP PLANT	8139	
Rajendra patil	8163	
ERS Plant	8487	
8th 9th REACTOR PLANT		
Mr. Sagar Patil	5258	
Shift Incharge	8491	
DCS Control Room	8498/8499	
APTFE Control Room	8501	
Oven Control Room	8502	
APTFE PLANT	8238	
APTFE LAB	8089	
VDF		
Control Room	8421/8422/8423	
G Floor Plant Area	8428	
2nd Floor/3rd Floor Plant Area	8429	
G Floor Operator Room	8432	
VDF R225/Ravi Rajoriya’	8424	
A&H Lab/CA Lab	8018	
Shift Lab (DPTFE)	8284	
Shift Lab (FKM)	8329	
Shift Lab (New Polymer)	8435/8436	
Shift Lab (TFE Lab)	8156/8213	
Canteen	8057	
Board Room (Admn. - 1st Floor)	8015	
Conference Room (Admn.- G Floor)	8017	
Audit	8036	
Admin - Pantry	8058	
Visiting Officers Cabin - Admin	8020	

GUJARAT FLUOROCHEMICALS LIMITED

CEO Office	8002	
Vadodara Office (A/C Dept.)	0265-6198111	5457
Noida Head Office	0120-6149600	5144
Ranjitnagar Plant	02678-248153	
SGC Payroll - Noida	0120-4049146	
NDO Duty officer :	**5155**	
Permanent mobile number :		7211120160

LIST OF WALKY-TALKY WITH CHANNELNUMBERS

Sr. No.	PLANT/DEPT.	CHANNEL
1	SPTFE/PTPTFE	1
2	Inst PTFE Shift Technician	
3	Mech PTFE Shift Engineer	
4	FKM	9
5	TFE1	5
6	Inst Polymer Shift Engineer	
7	Inst TFE Shift Technician	
8	Mech TFE Shift Engineer	
9	TFE2	6
10	DPTFE/APTFE/SR1/SR2	8
11	Inst DPTFE Shift Technician	
12	Mech DPTFE Shift Engineer	
13	CA/FLAKER	2
14	CMS-1	14
15	Inst CA/CMS Shift Engineer	
16	Mech CA/CMSShift Engineer	
17	CMS-2	4
18	AHF-A PLANT	15
19	Inst A&H Shift Engineer	
20	Mech A&H Shift Engineer	
21	AHF- H PLANT	16
22	CaCl2(N)/CO2/Granulator	3
23	COAL CPP/GAS CPP/ H2BOILER	7
24	HSE / SITE SHIFT MANAGER/OHC (Incase of Emergency all on This channel)	10
25	P&A/SECURITY	11
26	ELECTRICAL	13
27	CU/ETP	12
28	UTILITIES-POLYMER	

GUJARAT FLUOROCHEMICALS LIMITED

ANNEXURE – 24: EXTERNAL TELEPHONES (A) LOCAL CRISIS GROUP

Sr. No.	Name	Designation	Telephone (O)	Telephone (R)
1	Deputy Collector & SDM Bharuch	Chairman	(02642) 241980	MOBILE 9978405256
2	Mamlatdar Vagra	Co-Chairman	(02641) 225221	MOBILE 7574817007
3	Officer (IS&H) Bharuch	Secretary	(02642) 240421	MOBILE 9099046683 9428164488
5	Ramesh Solanki Head - HSEF, RIL, Dahej	Member	(02641) 356002	(02641) 356434 MOBILE 9998954068
6	Shailesh Nigam President, RIL, Dahej	Member	(02641) 357001	(02641) 356311 MOBILE 7977618501
7	D C Thakur Complex Head, GACL	Member	(02641) 613201 613202	(02642) 238308 MOBILE 9909021823
8	Pravin Kumar Prajapati Gujarat Chemical Port Limited (GCPL)	Member	(02641) 261005	MOBILE 9998035917
9	Col. Gautam K N General manager (Security & fire) Birla Copper	Member	(02641) 251029	MOBILE 8155001462
10	Rajesh Shukla Chief of Operations, Ineos Styrolution India Ltd	Member	(02641) 273314	MOBILE 7486007324
11	Vikas Baliyan Head - Fire RIL, Dahej	Member	(02641) 356006	MOBILE 8511129866
12	Dr. Paren Shah Chief Medical Officer, RIL	Member	(02641) 356033	MOBILE 9998987298

Sr. No.	Name	Designation	Telephone (O)	Telephone (R)
13	Dr. Deepak Dara Chief medical officer Birla Copper	Member	(02641) 256004/06 251008/09	MOBILE 9816014880
14	Sushil Machhi Senior Manager (HSE), PLL	Member	(02641) 670252/253	MOBILE 9662526295
15	M A Hania Sr.VP(Operation) MFL	Member		MOBILE 9979882207
16	Sanath Kumar EPO GFL	Member	(02641) 618009	MOBILE 9998023978
17	Dr. Sharad Potghan Head HSEF GFL	Member	(02641) 618090	MOBILE 7201000199
18	Dinesh Babu Factory Manager, SRF Limited, Dahej	Member	(02641) 289150	Mobile 9099002696
19	N N Patel GM GNFC Ltd	Member	(02641) 226016	MOBILE 9898030897
20	Somkumar Shukla Head HR,Admin & Liasion Hemani Industries Ltd	Member		MOBILE 9426253717
21	Police Sub Inspector Police Station, Dahej	Member	(02641) 256233	MOBILE 9825213405
22	Taluka Dev. Officer Vagra	Member	(02641) 225223 225697	MOBILE 7567012640
23	Police Inspector GIDC, Ankleshwar	Member	(02646) 225551	MOBILE 9408303240
24	Medical Officer, MBBS Community Health Centre, Vagra	Member	(02641) 225243	MOBILE 9427444428
25	Harishbhai Joshi Press Reporter, Bharuch	Member		MOBILE 9879553471 8140184149
26	Madhavsingh A Solanki NGO, Ambheta	Member	-	MOBILE 8200248541
27	Narendra P. Rana	Member	-	MOBILE

	Leader, Dahej			9427874566
28	Devendra Sinh D. Solanki Leader, Ambheta	Member	-	MOBILE 9879563990
29	Champaksinh U. Rana Leader, Dahej	Member	-	MOBILE 9426892262

GUJARAT FLUOROCHEMICALS LIMITED

ANNEXURE- 25: NOMINATED PERSONS TO DECLARE MAJOR EMERGENCY

Sr. No.	Name of the plant, department or location	Name and designation of the nominated persons to declare major emergency	Duty or designation given, if any, under the on-site/off-site emergency plan	Phone No.	Residence	
					Phone No.	Address
1	2	3	4	5	6	7
1	OVEAR ALL SITE	Mr. Sanath Kumar	Site Main Controller	9974066380	02641 - 618009	Bharuch
2	CA	Mr. PK Chauhan	Incident Main Controller	7698058588	02641 - 618106	Bharuch
3	CMS	Mr. DK Singh	Incident Main Controller	9624024526	02641 - 618131	Bharuch
4	TFE/PTFE/ PT- PTFE/DPTFE/ A-PTFE/FKM	Mr. Sanjay Bhan	Incident Main Controller	8347444166	02641 - 618193	Bharuch
5	CPP	Mr. Mukesh Jain	Incident Main Controller	8155077790	02641 – 618146	Bharuch
6	A&H	Mr. R. K Gupta	Incident Main Controller	9924114953	02641 - 618028	Bharuch

ANNEXURE – 26: FORM TO RECORD EMERGENCY TELEPHONE CALL

Part A: Essential Information	
Details of call as reported	
Caller's Name and designation **Date Time Phone No.**	
Purpose of call, if any particular advice required immediately?	
Name of chemicals **(To be spelt out clearly)**	
Brief description of incident. **Fire/Explosion/Liquid Spill/ Gas releases.** **Quantity involved** **Packaging/storing/handling/using details** **Location of incident.** **Cause, if known, in brief.**	
Part B : Information to be obtained if readily available	
Has anyone been injured? Yes/No If yes, how many? Affected by **chemicals? Yes/No If yes, how many?**	
What first-aid has been given?	
Has anyone been taken to hospital? Yes/No If yes, **address of the hospital.**	
Is the road blocked? Yes/No Closed to traffic? Yes/No	
Who owns the chemicals?	

Has the owner been informed? Yes/No
If caused by vehicles. **Vehicle Number and Name and Address of the Owner** **Has the owner been informed? Yes/No To whom** **was the load consigned?**

ANNEXURE – 27: SEPARATION DISTANCES

Sr. No.	Substance	Tanks		Separation Distance (M)
		Capacity	Nos.	
1	2	3	4	5
1	Chlorine	463 MT	3 Nos.	2.8
2	Methanol	198 MT	3 Nos.	3.0
3	Natural Gas	190000 SCM/Day	Not applicable	Not applicable
4	Coal	800 MT/Day	Not applicable	Not applicable
5	Hydrogen	100000 Nm3/Day	Not applicable	

GUJARAT FLUOROCHEMICALS LIMITED

ANNEXURE – 28: STATUTORY COMMUNICATIONS

Statutory information to be given to:	Periodicity of such information to be given (statutory or self-decided)	Date of last information given	To how many persons	Suggestions received if any	Last date of implementation of useful suggestions
1	2	3	4	5	6
Workers	By monthly	Departmental training record	Departmental training record	-	-
The general public and neighboring firms	do	do	do	-	-
District Emergency Authority	do	do	do	-	-
Factory Inspectorate	do	do	do	-	-

ANNEXURE – 29: EMERGENCY INSTRUCTION BOOKLET

Sr. No.	Role to be played as (Name, Emergency Designation viz. Incident Controller, particular key personnel or Essential Workers)	His emergency duties / functions (narrate in short and clear sentences and in 1, 2, 3…)	He should be at (The Incident place or Control Room)
1	2	3	4
1	Site Main Controller (SMC)	He will be overall in charge of all the activities to control the emergency In consultation with Incident Controller he will declare major emergency. He will ensure mutual help from and to nearby industries. He will approach neighboring industries for getting help, if possible. 5. He will take action for rehabilitation of victims at hospitals	Emergency Control Room Office of ED (SMC) / in absence of ED, Conference room (ADM Building) / OHC building (Emergency Control Center), Main Gate (Security)
2	Incident Controller (IC)	He will be in charge of all the actions to be taken at the spot of emergency Rush to accident site and inform Control Room and take action. Take charge at the scene of the incident and assess the scale of emergency Decide for continuing the operation of the plan. Ensure that outside emergency services have been called. Ensure that SMC and Key Personnel, as well as external agencies are called for Direct Essential Workers to carry out their duties to control the situation Brief the Site Main Controller Preserve evidences for subsequent fact finding investigations. . Look for trapped personnel and rescue . Establish communication with SMC at the earliest and brief him about the emergencies. **Note:** After "G" shift and on Sundays and Holidays – He will act as SMC.	Accident Site
3	Deputy Incident Controller (Dy. IC)	Immediately reach the spot and scene of the incident and help I.C. Will act as an I.C. in his absence Will ensure about the emergency and internal communication to utilities, security / fire staff, Effluent Treatment Plant and other Departments. Will act as a link with ECC (SMC and I.C. – Accident Site) Arrange for any control devices to stop the leakage (Any fossil fuel). Instruct to Shift Engineer to take attendance of assembled workers Assist in sending the victims, if any, for First Aid or hospital.	Accident Site
4	Safety Officer	Will reach the emergency spot and assist Incident Controller on all safety aspects such as delivering Personal Protective Equipment, helping personnel to use PPE, SCBA sets, masks and other appliances.	Accident Site
5	Key Personnel	Individual key persons will act in their respective prescribed duties to help Come at site with all required equipment and gadgets (PPE). 3. Will take other directives from I.C. and SMC.	Accident Site

GUJARAT FLUOROCHEMICALS LIMITED

ANNEXURE – 30: QUALITY MANAGEMENT SYSTEM CERTIFICATE (ISO 9001:2015)

intertek
Total Quality. Assured.

CERTIFICATE OF REGISTRATION

This is to certify that the management system of:

Gujarat Fluorochemicals Limited

Main Site: 12/A, GIDC Dahej Industrial Estate, Taluka Vagra, District Bharuch, Dahej – 392130, Gujarat, India

has been registered by Intertek as conforming to the requirements of:

ISO 9001:2015

The management system is applicable to:

Manufacturing and Supply of Caustic Soda, Chlorine, Hydrogen, Chloromethanes, Anhydrous Hydrogen Fluoride, DCTFMA (2,6-Dichloro-4-(trifluoromethyl)-aniline), TFE, VDF, R22; FKM (Fluoroelastomers), Different grades of PTFE, PFA, FEP, Micro-Powders, PPA (Polymer processing aids) and By-products like HCl, H2SO4, Dilute HF, Fluorosilicic Acid and Calcium Chloride.

Certificate Number:
IVA-0370.12

Initial Certification Date:
03 November 2009

Date of Certification Decision:
22 November 2021

Issuing Date:
23 November 2021

Valid Until:
22 November 2024

intertek

UKAS

Calin Moldovean
President, Business Assurance

Intertek Certification Limited, 10A Victory Park, Victory Road, Derby DE24 8ZF, United Kingdom

Intertek Certification Limited is a UKAS accredited body under schedule of accreditation no. 0114.

GUJARAT FLUOROCHEMICALS LIMITED

ANNEXURE – 31: ENVIRONMENT MANAGEMENT SYSTEM CERTIFICATE (ISO 14001:2015)



intertek
Total Quality. Assured.

CERTIFICATE OF REGISTRATION

This is to certify that the management system of:

Gujarat Fluorochemicals Limited

Main Site: 12/A, GIDC Dahej Industrial Estate, Taluka Vagra, District Bharuch, Dahej - 392130, Gujarat, India

has been registered by Intertek as conforming to the requirements of:

ISO 14001:2015

The management system is applicable to:

Manufacturing and Supply of Caustic Soda, Chlorine, Hydrogen, Chloromethanes, Anhydrous Hydrogen Fluoride, DCTFMA (2,6-Dichloro-4-(trifluoromethyl)-aniline), TFE, VDF, R22, FKM (Fluoroelastomers), Different grades of PTFE, PFA, FEP, Micro-Powders, PPA (Polymer processing aids) and By-products like HCl, H2SO4, Dilute HF, Fluorosilicic Acid and Calcium Chloride.

Certificate Number:
09121212003

Initial Certification Date:
03 November 2009

Date of Certification Decision:
22 November 2021

Issuing Date:
23 November 2021

Valid Until:
22 November 2024

intertek

UKAS MANAGEMENT SYSTEMS 014

Calin Moldovean
President, Business Assurance

Intertek Certification Limited, 10A Victory Park, Victory Road, Derby DE24 8ZF, United Kingdom

Intertek Certification Limited is a UKAS accredited body under schedule of accreditation no. 014.

GUJARAT FLUOROCHEMICALS LIMITED

ANNEXURE – 32: OCCUPATIONAL HEALTH & SAFETY MANAGEMENT SYSTEM CERTIFICATE (ISO 45001:2018)

intertek
Total Quality Assured.

CERTIFICATE OF REGISTRATION

This is to certify that the management system of:

Gujarat Fluorochemicals Limited

Main Site: 12/A, GIDC Dahej Industrial Estate, Taluka Vagra, District Bharuch, Dahej – 392130, Gujarat, India

has been registered by Intertek as conforming to the requirements of:

ISO 45001:2018

OHSAS 18001:2007 certified from 01 November 2009 to 17 December 2019.

The management system is applicable to:

Manufacturing and Supply of Caustic Soda, Chlorine, Hydrogen, Chloromethanes, Anhydrous Hydrogen Fluoride, DCTFMA (2,6-Dichloro-4-(trifluoromethyl)-aniline), TFE, VDF, R22, FKM (Fluoroelastomers), Different grades of PTFE, PFA, FEP, Micro-Powders, PPA (Polymer processing aids) and By-products like HCl, H2SO4, Dilute HF, Fluorosilicic Acid and Calcium Chloride.

Certificate Number:
0070475

Initial Certification Date:
03 November 2009

Date of Certification Decision:
22 November 2021

Issuing Date:
23 November 2021

Valid Until:
22 November 2024

intertek

UKAS MANAGEMENT SYSTEMS

Calin Moldovean
President, Business Assurance

Intertek Certification Limited, 10A Victory Park, Victory Road, Derby DE24 8ZF, United Kingdom

Intertek Certification Limited is a UKAS accredited body under schedule of accreditation no. 016.

GUJARAT FLUOROCHEMICALS LIMITED

ANNEXURE – 33: QHES Policy

GUJARAT FLUOROCHEMICALS
CIN : L24304GJ2018PLC105479

Gujarat Fluorochemicals Limited
Corporate Office: INOX Towers, Plot No. 17, Sector-16A, Noida-201301, Uttar Pradesh, India.
Tel: +91-120-6149600
Fax: +91-120-6149610 | www.gfl.co.in

CORPORATE INTEGRATED MANAGEMENT SYSTEM POLICY

(Our Commitment towards Quality, Health, Safety, Environment, Sustainability, security & Responsible Care)

Gujarat Fluorochemicals Limited, along with its subsidiaries – GFL Americas LLC, GFL GmbH, GFL GM Morocco, intends to be a market leader in the manufacturing and marketing of Caustic soda, Chlorine, Hydrogen, Chloromethanes, Polytetrafluoroethylene, Refrigerants, and Fluorospeciality Chemicals. The Company is adopting the integrated Management System Policy by making 'Responsible Care' an integral part of conducting business and operating facilities in a safe, environment-friendly, and sustainable manner and implementing its principles by the following underlying philosophy.

1. Occupational Health & Safety

That a safe and healthy workplace is built by preventing occupational injury and illness, eliminating hazards and reducing risks at the workplace, and encouraging consultation and participation by the involvement of workers' representatives throughout the OH and S Management System.

2. Environment Protection

That every employee and all stakeholders in the extended supply chain is highly sensitive and committed to achieving pollution prevention, waste reduction, recycling, energy and resource conservation (water), and environmental protection relevant to the context of the organization.

3. Product Quality

That product of desired quality meeting customer satisfaction is manufactured and supplied.

4. Customer Satisfaction

All employees in the Company understand the need to focus on the fulfillment of customer expectations as their primary objective.

5. Interested Parties Expectations

That every employee of the company focuses on fulfillment of expectations of the interested parties, which includes customers, external service providers, regulatory authorities, investors, surrounding communities and employees, etc.

6. Compliance Obligation

That the entire team complies with all applicable laws and other requirements that relate to quality, environment, occupational health, and safety.

7. Security Management

That all assets are physically protected, inventory accounted and risk management measures are in place based on potential security risks, periodically reviewed and that all are aware of the security procedures and systems.

8. Continual Improvement

That systems and processes are continuously improved, through external benchmarking, adopting the latest technologies and statistical and behavioral tools to improve safety, health, environmental performance, and fulfill customer expectations.

9. Learning and Development

That planned learning and developmental programs based on individual learning needs are an integral part of the company culture and operating system.

10. Business Integrity

That all business operations are conducted in an ethical manner and in compliance with the applicable laws and regulations including anti-corruption, bribery, fraud, and respect for human rights.

11. Leadership Commitment Objective and Monitoring and Review

That the Corporate Leadership will have its Policies, strategic targets, and objective for safety, Health, Environment, Quality, Sustainability, and Social Accountability in Sync with the overall business objectives and will monitor, review and issue necessary directives issued to ensure the Company's continued commitment and exemplify felt leadership.

The above applies to all Contractors, Sub – Contractors, Suppliers, and all Employees

Through the implementation of this Policy, the Company seeks to achieve

- The long-term trust of its stakeholders
- Incidents free, environmentally friendly, and sustainable operation in the complete supply chain
- Respect for neighbors and society at large

Dr. Sir Kapoor
Chief Executive Officer

Date-1st January 2022

An INOX GFL Group Company
Regd. Office: Survey No. 16/3, 26, 27, Village Ranjitnagar, Taluka Ghoghamba, Dist. Panchmahal - 389380, Gujarat, India.
Tel: +91-2678-248-152/153/107 | Fax: +91-2678-248153
Vadodara Office: ABS Towers, 2nd floor, Old Padra road, Vadodara-390007, Gujarat, India | Tel: +91-265-6198111/2330057 | Fax: +91-265-2310312

GUJARAT FLUOROCHEMICALS
VALUE THROUGH GREEN CHEMISTRY

GUJARAT FLUOROCHEMICAL LIMITED
SITE-A, DAHEJ

SAFETY REPORT

(Prepared as required by Schedule 8, Rule 68 J of the GFR 1963 and by Clause 10 of MSIHC Rule, 1989)

PREPARED BY

VERSATILE
Empowering the Future

VERSATILE ENGISAFE PRIVATE LIMITED

A-504, SAIDHAM RESIDENCY, NR. ABC CIRCLE, BHOLAV,
BHARUCH, GUJARAT, INDIA
PH: 02642-228151, +91-94263-58787

DOCUMENT DETAILS

TITLE	Safety Report	**VERSATILE ENGISAFE PVT. LTD.** A-504, Saidham Residency, Nr. ABC Circle, Bholav, Bharuch, Gujarat, India. Ph.: 02642-228151, Mo.:+91-94263-58787 **Email:**info@versatileengisafe.com
FOR	**GUJARAT FLUOROCHEMICAL LIMITED, SITE-A, DAHEJ** Plot No: 12/A, Industrial Estate Dahej, Tal: Vagra, Dist.: Bharuch, Gujarat	

DOC. NO.	**SR/GFL/2324/30001**	**SITE COORDINATOR**	Dr. Sharad Potghan Mr. Maulik shah Mr. Jikar Malek Mr. Dharmendra Doctor
DATE OF ISSUE	20th July 2023		
REVISION NO.	00		
PREPARED BY	Vishal Patoliya *Process Safety Engineer*	*Signature*	
REVIEWED BY	Dharmesh Sankla *Head-Operation*	*Signature*	
APPROVED BY	Sanjay Masrani *Director-Technical*	*Signature*	

00	20th July 2023	Rev.00	Issued for Confirmation
REV.	**DATE**	**STATUS**	**DESCRIPTION**

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CHAPTER – 1: NAME & ADDRESS OF THE PERSON FURNISHING THE INFORMATION

Sr.		DESCRIPTION	
1	**Full Name & Address of the company:**	Gujarat Fluorochemicals Limited 12/A, Industrial Estate Dahej, Tal: Vagra, Dist.: Bharuch, Gujarat	
2	**Phones :**	02641618031	
3	**Full Name & Residential Address of the occupier :**	Mr. Sanath Kumar 12/A, Industrial Estate Dahej, Tal: Vagra, Dist.: Bharuch, Gujarat	**Contact No:** 9724176011 **Office:** 02641618009
4	**Full Name & Residential Address of the Factory Manager :**	Dr. Sunil Bhatt 12/A, Industrial Estate Dahej, Tal: Vagra, Dist.: Bharuch, Gujarat	**Contact No:** 9099941862 **Office:** 02641618005
5	**Product**	Chemicals & Polymers	

CHAPTER – 2: DESCRIPTION OF INDUSTRIAL ACTIVITY

2.1 SITE:

An ISO 9001:2015, ISO 14001:2015, ISO 45001:2018 and SA 8000:2014 certified organization, GFL is a leading producer of Fluoropolymers, Fluoro Specialties, Refrigerants and Chemicals for applications in varied industries. GFL derives its strength from expertise in Fluorine Chemistry, vertical integration from natural minerals to Fluoropolymers and strong R&D, enabling it to provide one of the best quality products meeting all regulatory compliances, to our clientele globally.

The year 1989 marked commencement of Company's commercial operations with India's largest Refrigerant manufacturing unit at Ranjitnagar, Gujarat, India. The site was further expanded to produce Fluoro Specialty products catering to the growing demands in global agriculture and pharmaceutical industry. Foraying into new avenues in 2007, with one of the world's most integrated facilities at Dahej, Gujarat, India, GFL now has a diverse portfolio of Fluoropolymers comprising PTFE, PFA, FEP, FKM, PVDF and Fluoropolymer Additives.

With three manufacturing facilities in India, a captive Fluorspar mine in Morocco, offices and warehouses in Europe and USA, and a marketing network spread across the world, GFL is one of the established players in Fluoropolymers and Fluoro specialties markets.

Our Sustainability goals are interwoven with the way we do business all along our value chain. The company is signatory to the United Nations Global Compact (UNGC), and is a member of the Indian Chemical Council (ICC). Our focus on Health, Safety and Environment is reflected in the wellbeing and safety of our people. All-inclusive efforts towards sustainability at various facets make us long-term partners for our customers across geographies.

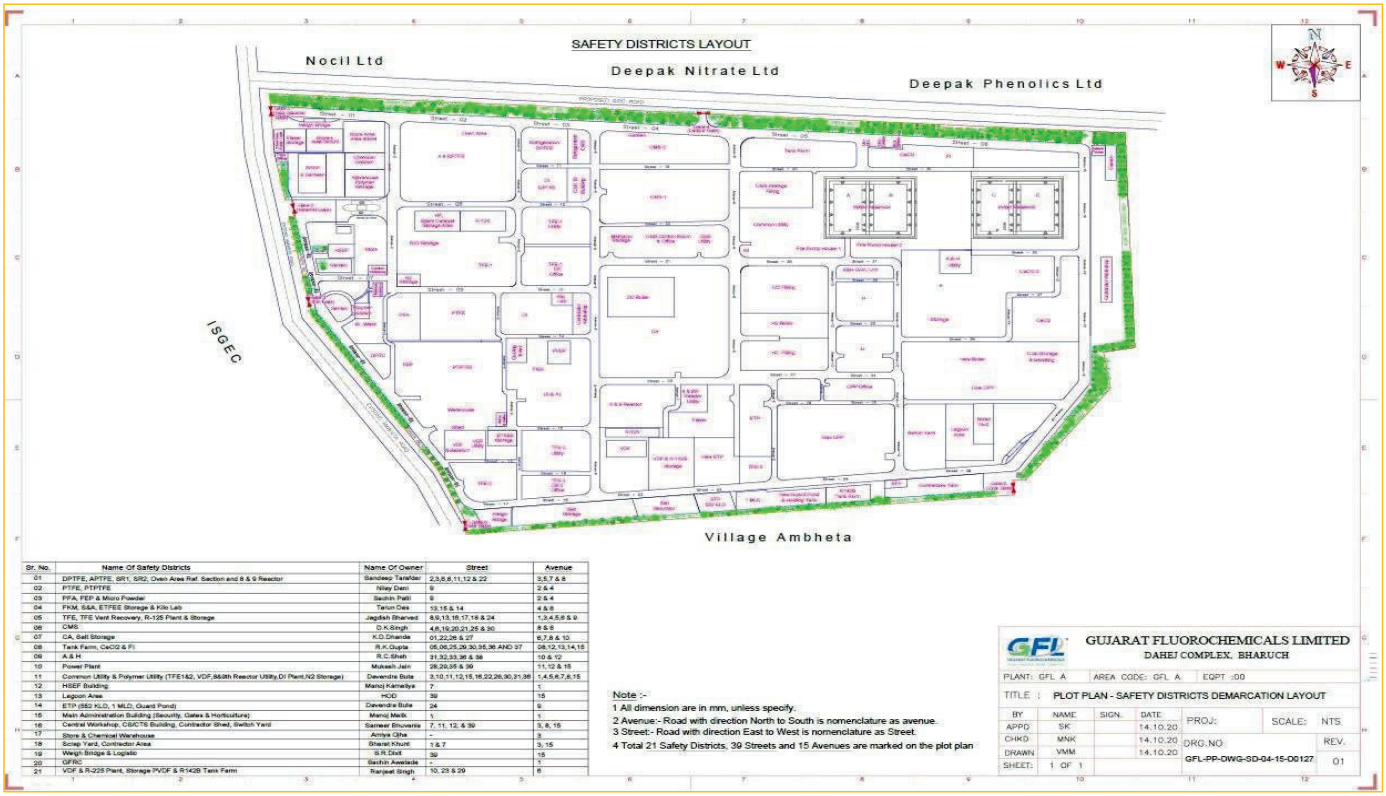
The surrounding of the Gujarat Fluorochemicals Limited (GFL) is described as below

Adjoining Properties of the company	
East Side	OPAL
West Side	ISGEC LTD
North Side	NOCIL, DPL, DNL
South Side	Ambheta Village

The Unit consists of the following departments/sections:

Sr. No.	Department/ Plant
1	CA
2	CMS
3	A&H
4	FI
5	CaCl2
6	CPP
7	UTILITY
8	ETP
9	TFE
10	PTFE, PTPTFE, PFA/FEP, Micro Powder
11	VDF, PVDF
12	DPTFE / APTFE/ SR-1 & SR-2/
13	FKM, Pilot Plant
14	Technical Services
15	LABORATORY
16	GFRC
17	COMMERCIAL
18	ACCOUNTS
19	WARE HOUSE
20	HR & Admin
21	HSEF
22	Engineering Office
23	IT

PLOT PLAN



Sr. No.	Name Of Safety Districts	Name Of Owner	Street	Avenue
01	DPTFE, APTFE, SR1, SR2, Oven Area Raf. Section and 8 & 9 Reactor	Sandeep Tamfder	2,3,6,8,11,12 & 22	3,5,7 & 8
02	PTFE, PTFFFE	Nilay Dani	9	2 & 4
03	PFA, FEP & Micro Powder	Sachin Patil	9	2 & 4
04	FKM, S&A, ETFEE Storage & Kilo Lab	Tarun Das	13,15 & 14	4 & 8
05	TFE, TFE Vent Recovery, R-125 Plant & Storage	Jagdish Bhanved	8,9,13,16,17,18 & 24	1,3,4,5,6 & 9
06	CMS	D.K.Singh	4,6,19,20,21,25 & 30	8 & 8
07	CA, Salt Storage	K.D.Dhande	01,22,26 & 27	6,7,8 & 10
08	Tank Farm, CaCl2 & FI	R.K.Gupta	05,06,25,29,30,35,36 AND 37	08,12,13,14,15
09	A & H	R.C.Shah	31,32,33,36 & 38	10 & 12
10	Power Plant	Mukesh Jain	28,29,35 & 39	11,12 & 15
11	Common Utility & Polymer Utility (TFE1&2, VDF,8&9th Reactor Utility,D1 Plant,N2 Storage)	Devendra Bute	3,10,11,12,15,16,22,26,30,31,36	1,4,5,6,7,8,15
12	HSEF Building	Manoj Kamaliya	7	1
13	Lagoon Area	HOD	39	15
14	ETP (6&7 KLD, 1 MLD, Guard Pond)	Devendra Bute	24	9
15	Main Administration Building (Security, Gates & Horticulture)	Manoj Malik	1	1
16	Central Workshop, CS/CTE Building, Contractor Shed, Switch Yard	Sameer Bhuvania	7, 11, 12, & 39	3, 8, 15
17	Store & Chemical Warehouse	Amiya Ojha	-	3
18	Scrap Yard, Contractor Area	Bharat Khunt	1 & 7	3, 15
19	Weigh Bridge & Logistic	S.R.Dixit	39	15
20	GFRC	Sachin Awalade	-	1
21	VDF & R-225 Plant, Storage PVDF & R142B Tank Farm	Ranjeet Singh	10, 23 & 29	6

Note :-
1 All dimension are in mm, unless specify.
2 Avenue:- Road with direction North to South is nomenclature as avenue.
3 Street:- Road with direction East to West is nomenclature as Street.
4 Total 21 Safety Districts, 39 Streets and 15 Avenues are marked on the plot plan

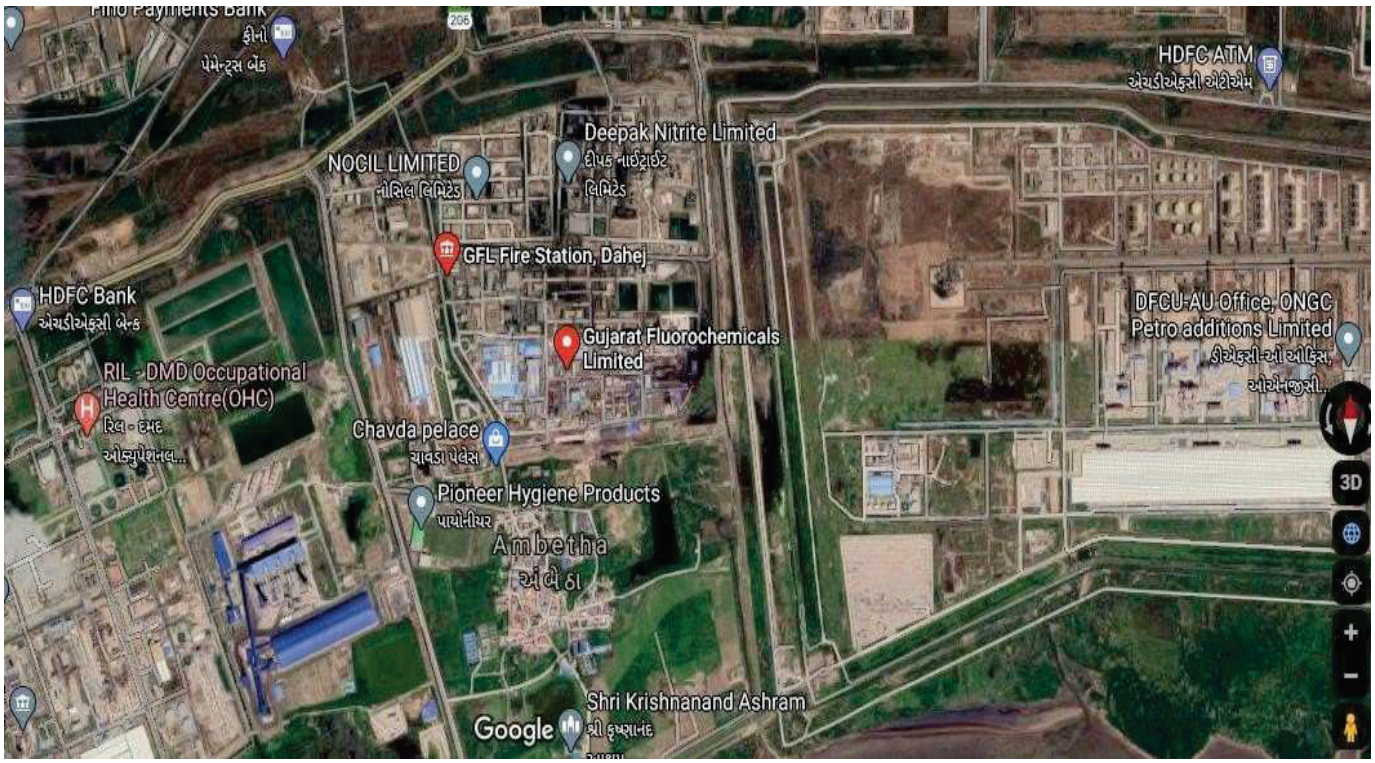
GUJARAT FLUOROCHEMICALS LIMITED
DAHEJ COMPLEX, BHARUCH

PLANT: GFL A | AREA CODE: GFL A | EQPT :00

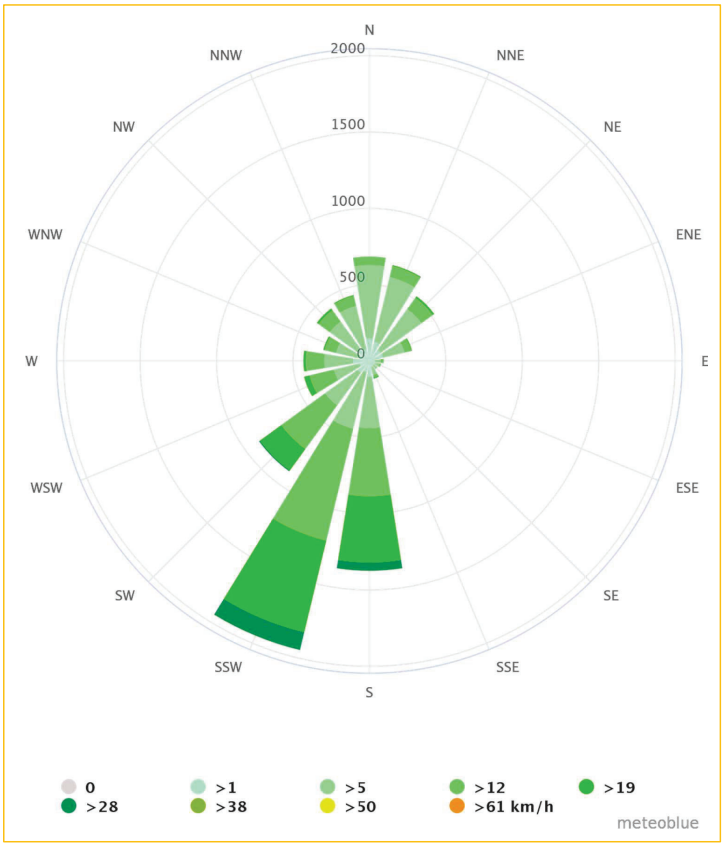
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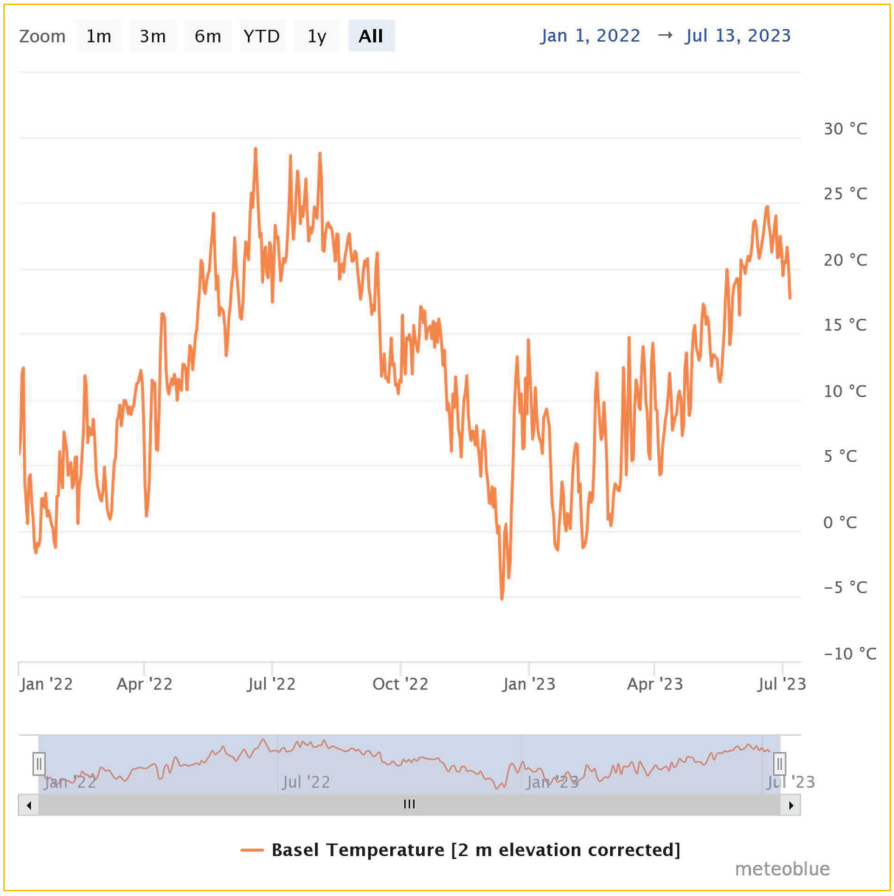
BY	NAME	SIGN.	DATE	PROJ:	SCALE: NTS
APPD	SK		14.10.20		
CHKD	MNK		14.10.20	DRG.NO.	REV.
DRAWN	VMM		14.10.20	GFL-PP-DWG-SD-04-15-06127	01
SHEET:	1 OF 1				

Area Map


HDFC ATM
Deepak Nitrite Limited
NOCIL LIMITED
GFL Fire Station, Dahej
HDFC Bank
Gujarat Fluorochemicals Limited
DFCU-AU Office, ONGC Petro additions Limited
RIL - DMD Occupational Health Centre(OHC)
Chavda pelace
Pioneer Hygiene Products
Ambetha
Shri Krishnanand Ashram
Google
3D

Weather Conditions




Zoom 1m 3m 6m YTD 1y All
Jan 1, 2022 → Jul 13, 2023
30 °C
25 °C
20 °C
15 °C
10 °C
5 °C
0 °C
-5 °C
-10 °C
Jan '22
Apr '22
Jul '22
Oct '22
Jan '23
Apr '23
Jul '23
Basel Temperature [2 m elevation corrected]
meteoblue

2.2 CONSTRUCTION DESIGN

The buildings of the plant where designed as per industrial National building design codes, keeping in view of the seismic zone declared by Government. Dahej falls under Seismic zone III as declared by Institute of Seismological Research Institute (Government of Gujarat). The other site constraints like (i) Topography and geology (ii) Weather (iii) Environment (iv) Transport (v) Services and (vi) Legal constraints have been considered for safe design.

Topographical feature means lie of the land and geological features means it load bearing capacities. Whether includes temperature, wind condition, solar radiation, thunderstorms, etc. Environment covers people, activities and buildings in the vicinity. Services are power, Water & effluent. Legal constrains include planning and building, effluent and pollution, traffic, fire and other safety laws, by laws and regulations which are replaced, revised, modified, depending upon new Experiences and research.

Site standard for (i) Separation distances (ii) Building lines (iii) Building construction finish, (iv) Road dimensions- width, gradient, radius (v) service corridor & (vi) Pipe bridges have been observed according to prevailing regulations in India at the time of construction. The Process vessel were designed, constructed and tested as per ASME Section- VIII div.I and process piping as per ASME B31.3 or such other standard or code approved by the Chief Controller.

For further assurance of the construction design and stability of the manufacturing building, company has taken stability certificates. Plant wise details are available in the certificate.

DESIGN CODES USEDs FOR CONSTRUCTION

Sr. No	Civil & Structural Design	List of IS Code
1	Building & Other Facility Design	Nation Building Code
2	Code of Practice for Plain and Reinforced Concrete	IS 456
3	Code of Practice for Design loads (other than Earthquake) for buildings and structures (Wind Loads)	IS 875 (Part 3)
4	Code of Practice for General Construction in Steel	IS 800
5	Criteria for Earthquake resistant design of structure.	IS 1893
6	Ductile Detailing of Reinforced Concrete Structures subjected to Seismic Forces.	IS 13920
7	Code of Practice for Concrete structure for storage of liquids	IS 3370 (Part 4)

Sr. No.	Particular	Certificate No.	Valid up to
1	Certificate of Stability	STB/2019-2020/HZG/32	14.08.2019

⇒ **Note:** It is mandatory requirement under The Gujarat Factories Rule 1963 (GFR) that Stability certificate of the Building to be taken in Form No- 1 – A of the GFR from DISH Approved Competent person and to be submitted to local DISH Office.

Sr. No.	Legal Requirement & its details	License / Registration No.	Validity
The Public Liability Insurance Act, 1991 and Rules, 1991			
	The Public Liability Insurance Act, 1991 and Rules, 1991	L0229599	04/04/2024
The Boilers Act			
2.	Certificate for use of a boiler	Boiler GT-6041	31.12.2024
3.	Certificate for use of a boiler	Boiler GT-8091	31.12.2024
4.	Certificate for use of a boiler	Boiler GT-6488	31.12.2024
5.	Certificate for use of a boiler	Boiler GT-6472	31.12.2024
PESO Licenses			
6.	Storage of Liquid Chlorine	S/HO/GJ/03/915 (S30612)	30.09.2024
7.	Liquid N_2 (10.40 KL)	S/HO/GJ/03/1165 (S35006)	30.09.2024
8.	Liquid N_2 (19.38 KL)	S/HO/GJ/03/944 (S31609)	30.09.2023
9.	Liquid N_2 (3.70 KL)		
10.	Liquid N_2 (40.39 KL)		
11.	R22 Storage (Chlorodifluoromethane) & HFP Storage tank	S/HO/GJ/03/953 (S 31114)	30.09.2025
12.	Hydrogen (H_2) Storage : 315 Nos.	G/HO/GJ/06/575 (G22172)	30.09.2029
13.	Hydrogen (H_2) Filling : 38 Nos. Filling points (1X4 & 2X16)	G/HO/GJ/05/586 (G 22172)	
14.	Methanol (Petroleum Class A) for 240 KL	P/HQ/GJ/15/4798 (P 184279)	31.12.2025
15.	HFP Tonner Storage: 23 Nos. Cylinders Hexafluoro propene (R-1216)	G/HO/GJ/06/688 (G27680) Dt. : 21.09.2017	30.09.2030
16.	HFP Tonner Filling Filling: 1 Filling point	G/HO/GJ/05/688 (G27680)	
17.	R-23 storage layout approval	S/HO/GJ/03/1705 (S66174)	30.09.2023
18.	Spent Methanol storage (20) KL storage License	P/HQ/GJ/15/5466 (P369983)	31.12.2026
19.	VDF storage (VINYLIDENE FLUORIDE(VDF) 39 MT	S/HO/GJ/03/1778(S73093)	30.09.2025
20.	Storage of Ammonia in cylinder	G/WB/GJ/06/205(G47478)	30.09.2028
The Environmental Laws			
21.	CCA details	AWH-118244	15.02.2027
The Explosive Act, 1984 & The Gas Cylinder Rules, 2016			
22.	For storing compressed gas (Chlorine-136 Nos.) in cylinder	G/HO/GJ/06/580 (G22655)	30.09.2027

23.	For filling compressed gas (Chlorine-6 Nos.) in cylinder	G/HO/GJ/05/591 (G22655)	30.09.2027
Poison License			
24.	Methanol Poison License (100 KL)	Lic. No. 311/2006	31.12.2024
25.	H2SO4 and HCL Poison License	License No. (MAG/Poison Lic/Ws/1857)	31.10.2023

DESIGN CODE USED FOR PROCESS EQUIPMENT & PIPING DESIGN

Sr. No.	Description	Design Codes/ Standards
A	**Equipment & Pipeline Design**	
1	Pressure Vessels & Reactors	ASME Sec VIII Div. - 1, (ASME Sec II (All Parts), ASME Section V, ASME Section IX)
2	Storage Tanks (non-pressurized)	API 650
3	Heat Exchangers	TEMA Class C and ASME Sec VIII Div. – 1
4	**Pumps**	
	Centrifugal Pumps	ASME B 73.1M, Critical Duty: API 610 for pure solvents
5	**Compressor**	
	Air/ Nitrogen Compressor	Vendor's Standard
	Gas Compressor	API 617 or API 672
6	Process & Utility Piping & Steam Piping (< 3.5 bar or <250 mm NB)	ASME B 31.3
7	High pressure steam piping (> 3.5 bar or >250 mm NB)	ASME B 31.1 & IBR
8	**Valves**	
	Ball Valves – Process	ASME B 16.34 or API 608
	Ball Valves – Utilities	ASME B 16.34 or API 608
	Globe Valves – Process	Design: BS 1873 or API 600, Testing:BS 6755 P-1/ API 598
	Globe Valves – Utilities	Design: BS 1873 or API 600, Testing:BS 6755 P-1/ API 598
	Butterfly Valves – Utilities	
	Check Valves – Process	Design: BS 1868 or API 600, Testing: BS 6755 P-1/ API 598
	Check Valves – Utilities	Design: BS 1868 or API 600, Testing: BS 6755 P-1/ API 598
	Fire Safe Ball Valve	API 607
	Valve End to End Dimensions	ASME B 16.10

9	**Pipes**	
	Carbon Steel – Process	ASTM A 106 - Grade as per requirement
	Carbon Steel – Utilities	IS 1239 or IS 3589
	Stainless Steel – Process	ASTM A 312 - Grade as per Requirement
	Carbon Steel: Design	ASME B 36.10
	Stainless Steel – Design	ASME B 36.19
10	**Fittings**	
	Carbon Steel – Process	ASTM A 105 or A 234 WCB
	Carbon Steel – Utilities	ASTM A 105 or A 234 WCB
	Stainless Steel – Process	ASTM A 182 or A 403 - Grade as per requirement
	Design	ASME B 16,11 or B 16.9
11	Flanges	ASME B 16.5
12	Gaskets	ASME B 16.21
13	Bolts/ Nuts	SA 193 GR. B7 & SA 194 GR 2H ZINC with cadmium passivated coating

2.3 PROTECTION ZONES (EXPLOSION PROTECTION, SEPARATION DISTANCES)

There are many explosives, flammable and toxic chemicals being handled and various hazardous processes being carried out at GFL, Dahej such as storage and processes of Class A, Class B, and Class C solvents.

There is possibility of fire and explosion affecting the surrounding area and there is a possibility of toxic gas release in the event of Disaster. This may affect the population residing in the vicinity, depending upon the quantity of release, wind direction, wind speed and concentration. Separation Distance between tanks and other vessels are kept as per standard technical practices.

Separation distances for the storage has been maintained as per below mentioned tables for Class A, Class B, Class C [Petroleum products].

Separation distance for Class A; Class B, Class C are as mentioned in below table as required by Petroleum Rule 2002. Here in GFL, Dahej Storage capacity of petroleum products in above ground tanks are as mentioned in table. Hence following separation distances shall be applicable.

A	B	C	D	E	F	G
	Container Size Range in gal (W.C.)	Separation between a property line, important building or other property and the nearest container which is	Minimum Distance (ft)	Is the Facility compliant? Yes	No	NFPA 58 Section Reference (2014 Edition)
1	501 through 2,000	Aboveground	25			6.3.1, 6.3.2 and Table 6.3.1.1
2	2,001 through 30,000	Aboveground	50			
		Underground or Mounded	50			
		Between containers	5			
3	30,001 through 70,000	Aboveground	75			
		Underground or Mounded	50			
		Between containers	¼ sum of diameters of adjacent containers			
4	70,001 through 90,000	Aboveground	100			
		Underground or Mounded	50			
		Between containers	¼ sum of diameters of adjacent containers			
5	All sizes greater than 125 gal	Separation distance between an aboveground LP-Gas container and an aboveground storage tank containing flammable or combustible liquids of	20			6.4.4.6 and 6.4.4.7

		flash points below 200 o F				

A	B	C	D	E	F	G
	Type of Exposure within or outside the facility boundary	**Check if exposure is present**	**Minimum Distance (ft)**	**Is the Facility compliant? Yes**	**No**	**NFPA 58 Section Reference (2014 Edition)**
1	Buildings, mobile homes, recreational vehicles, and modular homes with at least 1-hour fire-rated walls		10			Section 6.5.2 and Table 6.5.2.1
2	Buildings with other than at least 1-hour fire-rated walls		25			
3	Building wall openings or pits at or below the level of the point of transfer		25			
4	Line of adjoining property that can be built upon		25			
5	Outdoor places of public assembly, including school yards, athletic fields, and playgrounds		50			
6	Public ways, including public streets, highways, thoroughfares, and sidewalks	From points of transfer in LP-Gas dispensing stations and at vehicle fuel dispensers.	10			

		From other points of transfer	25			
7	Driveways		5			
8	Mainline railroad track centrelines		25			
9	Containers other than those being filled		10			
10	Flammable and Class II combustible liquid dispensers and the fill connections of nonstationary containers		10			
11	Flammable and Class II combustible liquid aboveground containers and filling connections of underground containers		20			
12	LP-Gas dispensing device located close to a Class I liquid dispensing device.		10			

NOTE: Place a checkmark in column C against an exposure that is present in or around the facility. Fill columns E or F for only those rows for which there is a checkmark in column C.

To from	Storage	Storage	Storage	Storage	Storage	Tank	Tank	Flame	Non	Office	Bound
	Tank for petroleum class A	Tank for petroleum class B	Tank for petroleum class C	Filling shed for petroleum class A or class B	Filling shed for petroleum class C	Vehicle loading / unloading area for petroleum class A or class B	Vehicle loading / unloading area for petroleum class A or class B	Proof electric pump	Flame Proof electric pumps	Office building workshops, stores amenities, fire station, etc. Within installation	Boundary fencing around installation
	1	2	3	4	5	6	7	8	9	10	11
Storage tank for Petroleum Class A 15m	0.5D or d or 15m	0.5D or d or	6m	15m	15m	15m	15m	15m	15m	15m	20m
Storage tank for Petroleum Class B 15m	0.5D or d or 15m	0.5D	6m	15m	15m	15m	15m	8m	15m	15m	15m
Storage tank for Petroleum Class C	6m	6m	x	15m	x	8m	x	x	x	8m	4.5m
Storage /filling shed for Petroleum Class A Or class B	15m	15m	15m	x	8m	15m	15m	8m	15m	15m	15m
Storage /filling shed for Petroleum Class C	15m	15m	x	8m	x	8m	x	x	x	8m	4.5m
Tank vehicle loading/ unloading area for Petroleum Class A or Class C	15m	15m	x	15m	x	x	x	x	x	8m	3m
Flame Proof Electric pump	8m	8m	x	8m	x	8m	x	x	8m	8m	3m
Non Flame proof electric pump	15m	15m	x	15m	x	15m	x	8m	x	3m	x
Boundary fencing around installation.	20m	15m	4.5m	15m	4.5m	15m	3m	3m	x	x	x

- **Cleanliness and restriction of unauthorized person.** - The area within the safety distance of the installation shall be kept free from ignitable materials, such as weeds, dry grass.

  (1) The area where vessels, pumping equipment, loading and unloading facilities and indirect heated vaporisers are provided, shall be enclosed by an industrial type fence at least 2 metres high along the perimeter of the safety zone.

  (2) Every fence shall have at least two means of exit and the gates of such exits shall open outwards and shall not be self-locking.

  (3) A permanent notice with letters at least five centimetres in height prohibiting smoking and naked lights shall be fixed to the fence surrounding the area where flammable or oxidising gases are stored and such notice shall be visible from outside.

- **Earthing.**

  (1) All vessels used for storage of flammable compressed gases shall be electrically connected with the earth in an efficient manner.
  (2) Pipelines conveying flammable liquids shall be adequately prepared for electrical continuity and connected with the earth in an efficient manner.

- **Fire protection.** - All vessels used for the storage of flammable compressed gases shall be protected against fire hazards as under-

  (i) provision shall be made for an adequate supply of water and fire protection in the storage area in accordance with the provision of the rules and the regulation applicable in that area. The application of water may be by hydrants, hoses and mobile equipments, fixed monitors or by fixed spray systems which may be automatic. Control of water flow should be possible from outside any danger area. The fire water system shall be designed with medium velocity sprinklers for above ground storage vessels, filling sheds, loading or unloading area, and pump sheds having minimum spray density of 10 litre per minute per square meter for the single largest risk area and with additional requirements for hydrant points. In plants referred to in Table 4(A) of rule 22, the quantity of water available shall be sufficient for four hours of firefighting, and in plants referred to in Table 4(B) of rule 22, the same shall be for two hours of firefighting. For other installations not covered under Tables 4(A) and 4(B), the fire water storage shall be as approved by the Chief Controller;

  (ii) hydrants, where provided, shall be readily accessible at all times and so spaced as to provide for the protection of all vessels;
  (iii) sufficient length of fire hose shall be provided and shall be readily available. The outlet of each hose line shall be equipped with a combination jet and fog nozzle. The hoses should be maintained well and periodically inspected;
  (iv) mobile equipment, fixed monitors or fixed spray systems shall be designed to discharge water at a rate sufficient to maintain an adequate film of water over the surface of the vessel and supports under fire conditions;

(v) consideration shall be given to the provision of mobile or fixed water spray systems giving suitable and effective protections for vehicle loading and unloading areas;
(vi) at least two dry chemical powder type fire extinguishers of 9 kg. capacity each shall be installed at each point of access to the installations;
(vii) In liquefied Petroleum Gas dispensing station for fuelling motor vehicles, having only underground or earth covered (mounded) liquefied petroleum gas storage vessels, two numbers seventy kilograms' dry chemical type fire extinguishers shall be provided. In dispensing stations having above ground liquefied petroleum gas storage vessels, hydrants with minimum water pressure of seven kilograms per square centimetre shall be provided at convenient positions for around coverage of storage vessels and handling area, and water sprinklers with spray density of ten litres per minute per square metre shall be provided. The fire water pump shall be preferably diesel engine driven with capacity to deliver water at the rate and pressure specified above. The minimum fire water storage at the premises shall be that needed for fighting fire at least for one hour.

Protection zone (electrical) has been maintained as per below para.

Installations for production. processing '[use] or treatment of energy gases. LPG is Flammable Gases: Category 1 Gases under pressure: Liquefied gas hence electrical installation in Zone-0 Area was not allowed where as other electrical installation in nearby vicinity shall be as per Zone-1 requirements.

Hence all electrical meters, distribution boards, switches, fuses, plugs and sockets shall be of flameproof construction complying with the requirements of IS:2148: 1968 and the frames shall be effectively earthed and (ii) all electrical fixed lamps shall be enclosed in a well glass flameproof fitting conforming to IS:2206 (Part I): 1962.

- **Classification of hazardous area for flammable gases.**

(1) A hazardous area for flammable gases shall be deemed to be -

(a) **a zone '0' area** if inflammable gases or vapours are expected to be continuously present in the area; or

(b) **a zone '1' area**, if inflammable gases or vapours are expected to be continuously present in the area under normal operating conditions; or

(c) **a zone '2' area**, if inflammable gases or vapours are expected to be continuously present in the area only under abnormal operating conditions or failure or rupture of an equipment.

(2) If any question arises as to whether hazardous area is a zone '0' area or a zone '1' area or a zone '2' area, the decision thereon of the Chief Controller shall be final.

2.4 ACCESSIBILITY OF THE PLANT

The GFL is located at Plot no 12/A, Dahej GIDC Estate, Tal.: Vagra, Dist.: Bharuch, Gujarat, which is highly developed industrial estate in the Gujarat State. Different types of manufacturing units are working at the Dahej GIDC.

GFL is located near to Dahej state highway, which is the main access road to the Unit. Nearest Railway Station is Bharuch railway station and Nearest Bus station is Bharuch Bus station.

All the plants are easily accessible from the road side as can be seen from the map. The factory has 05 gates and all 05 gates can be used during emergency escape, rescue and firefighting routes.

All the production and utility area within the factory is also provided by sufficiently wide road and can be accessed from different directions. This can be seen in the attached drawing and area map also.

Connectivity	Distance
Connectivity with national highway	State Highway: SH No.- 206 , Approx. 0.38 KM West
Connectivity with railway station	Dahej Railway Station: Approx. 1.60 KM North
Distance of nearest fire station	GFL fire station Approx. 500 Meter
Distance of nearest police station	Dahej police station Approx. 3.1 KM
Distance of nearest hospital	RIL - DMD Occupational Health Centre(OHC) Approx. 12 KM

2.5 MAXIMUM NO. OF PERSONS WORKING ON THE PLANT AND PARTICULARS OF THOSE EXPOSED TO HAZARDS

No person is directly exposed to any hazards as the entire plant processes are in closed circuit. Number of persons working on the site especially in plant is as follows:

Details of work force: Man Power (Including workers, Trainees, Apprentice)

Manpower Sr. No	Shift	Male	Female	Total	Total Overall in the factory
1	General (G)	1300	20	1320	"Workers" include all employee, contract workers, trainees, apprentices, etc.
2	First	544	0	544	
3	Second	329	0	329	
4	Third Shift	704	0	353	
	Total Workers	2877	20	2897	

***Numbers of Contract employee may vary as per project activity.**

CHAPTER – 3: DESCRIPTION OF PROCESS

3.1 TECHNICAL PURPOSE OF THE INDUSTRIAL ACTIVITY

PRODUCTION PROCESS:

Production of Fluoropolymers including Poly Tetrafluoro Ethylene (PTFE), manufacture refrigerant gas Difluoromethane (HFC–32) and related products in premises.

Products

a. Poly Tetra Fluoro Ethylene Plant (PTFE)

1) Chloroform
2) Methylene Dichloride (MDC)
3) Sulphuric Acid (70%- 88%)
4) Hydrochloric Acid (12 % + 1%)
5) Hydrochloric Acid (31 % + 1%)
6) Carbon Tetrachloride (CTC)

b. Chlor – Alkali Plant

7) Caustic Soda (Dry Basis)
8) Chlorine Dry Basis
9) Hydrogen
10) Hydrochloric Acid (31% + 1 %)
11) Sodium hypochlorite (10% chlorine)

c. Other Products

12) Calcium Chloride
13) Tetra Fluoro Ethylene (TFE)
14) Hepta Fluoro Propane (HFPP)
15) Telomer Iodine
16) Telomer Alcohol
17) Dilute HF (20 %)
18) High Boiler of Chloromethane
19) Hexa Fluoro Propylene (HFP)
20) Hexa Fluoro Propylene Oxide (HFPO)
21) Tetrafluoro Dimethyl Amine (TFE DMA)
22) Anhydrous Potassium Fluoride (APF)
23) Dichloro Fluoro Chloromethane (R-21)
24) Ethyl Tetra Fluoro Ethyl Ether (ETFEE)
25) Dichloropentafluoro Propane
26) (HFC-225)
27) Pentafluoroethane (HFC -125)
28) Methyl Tetra Fluoro Ethyl Ether (MTFEE)
29) Br Ethyle Difluoroacetate (Br EDFA)

30) Tetra Fluoroethylene (TFE Tetramer)
31) Tri fluro Methane

d. New ADDITIONAL products and Few Existing Products EXPANSION (in hich EC is desired)

32) Polytetra Fluoro Ethylene (PTFE) #
33) Gypsum
34) Fluoro Elastomers (FKM)
35) Perfluoro Alkoxy (PFA)
36) Polyvenylidene Fluoride (PVDF)
37) Fluorinated Ethylene Propylene (FEP)
38) Intermediate Vinylidene Fluoride (VDF)
39) Difluoromethane (HFC–32)
40) Hydrofluosilicic Acid (20%)
41) 1,1,3Trichlorotetrafluoropropane

3.2 THE BASIC PRINCIPLE OF THE TECHNOLOGICAL PROCESSES

A. Chlor-Alkali Plant

This plant is designed to produce Liquid Chlorine of 337 MT / Day and Caustic Soda of 11400 MT / Month based on state of the artIon-exchange membrane cell process developed by Asahi, Japan. The Chlor-Alkali plant is designed to produce 380 TPD caustic soda based on the Ion Exchange Membrane Technology. In the electrolysis process, hydrogen gas and caustic soda are produced in the catholyte compartments. Chlorine gas is produced in the anolyte compartments. Hydrochloric Acid is manufactured from Cl2 and H2 gas generated in the electrolysis process, in hydrochloric acid synthesis unit. The process consists of following sections:

1. Primary brine purification,
2. Secondary brine purification,
3. Electrolysis,
4. De-Chlorination,
5. Caustic Soda Evaporation,
6. Cl_2 gas washing &cooling, drying,
7. Cl_2 gas compression and liquefaction,
8. Cl_2absorption,
9. H_2 gas washing
10 Chlorine Synthesis

The Chlor-Alkali Plant is controlled by DCS to provide an Integrated Plant Control with following associations:

i. Distributed Control System (DCS)
ii. Safety Interlock System
iii Remote Control Panel for rectifiers
v. Instrument Panel with monitoring and alarm modules, recorder for Cl2 and H2 gas Pressure /differential pressure

Brine solution is used as feedstock, and it is purified in order to remove impurities before sending to Electrolysis Unit. Raw salt is dissolved with return brine solution from electrolyzer, and it is sent to Reactor with sodium carbonate, barium carbonate and caustic soda to exchange the calcium, magnesium and other multivalent ions present in the raw brine. After this reaction, brine solution flows into clarifier to settle suspended solids and the clear liquid is sent to Pre-coat type ceramic filters and Ion-exchange column for further purification. Electrolysis Unit is composed of Electrolyzer, Anolyte and Catholyte circulation facilities. Each electrolyzer of 142 cells is designed to produce 385 ton/day of Caustic Soda as 100% at the current density of 6.0 kA/m2. The purified brine is supplied to anolyte compartment, where the chlorine gas (Cl2) is generated and then sent it to Catholyte compartment, where hydrogen gas (H2) and Caustic Soda are produced. Wet Cl2 undergoes washing, Cooling, Drying and Compression processes and finally stored in a

Liquid Cl2 Storage tank by Liquefaction process. Wet H2 gas from the Electrolysis is sent to H2 gas Scrubber. The depleted brine from the electrolysis section is pumped to De-chlorination Tank, which is kept

under vacuum by Steam Ejector. The dissolved Cl2 is stripped together with water vapor and is cooled in De- chlorinationCooler.TherestillremainsasmallamountoffreeCl_2, which is removed by adding Sodium Sulfite solution. Then, the brine is sent to Primary Brine Purification section. Caustic soda solution from Electrolyzer is fed to Caustic Evaporation Unit for purification. Various raw materials required such as NaCl, Flocculent, Sodium Carbonate, Barium Carbonate, Hydrochloric Acid and Sulfuric Acid are stored in separate storage areas. Utilities such as Steam, Nitrogen, raw water and DM water are supplied from the main utility area. Chilled water and cooling water requirement is met by dedicated chilled water and cooling water plants located in the caustic soda plant area. Chilled water consumption in the plant is about 300 m^3/hr. and plant capacity is 250 TR. Cooling water consumption in the plant is approximately 2000m^3/hr.

- **Chloromethane Plant**

The CMS Plant is designed to produce 310 TPD of Chloromethane which are Methylene Dichloride, Chloroform and Carbon tetrachloride. The process is carried out in two stages:

Hydro-chlorination in which Methanol gas reacts with HCl gas to produce Methyl Chloride (exothermic reaction) and Therma Chlorination of Methyl Chloride with Chlorine to produce Methylene Dichloride, Chloroform and Carbon Tetrachloride as per the requirement by altering the feed ratios. The main product produced is Chloroform and this is fed as raw material to the existing R-22 Manufacturing. The process consists of following sections:

1) Hydro Chlorin section Unit.
2) Chlorination Unit.
3) Product Rectification Unit.
4) Hydrogen Chloride Absorption Unit.
5) Regeneration and Drying Unit.
6) Acid and Alkali storage Unit.
7) Refrigeration Unit.
8) Steam and Condensate Recovery system.

The CMS Plant is controlled by Distributed Control System to provide an Integrated Plant Control with following:

1) Safety Interlock System
2) Remote Control Panel for rectifiers.

The feedstock Methanol (CH_3OH) and Hydrochloride (HCl) react to produce Methyl Chloride in Hydro chlorination unit. This product is sent to Chlorination unit with Chlorine gas (Cl2). Both of them undergo thermal chlorination and produce a mixture of Dichloromethane, Chloroform (CHCl3) and Carbon Tetrachloride (CCl4). This product mixture is rectified in Rectification unit and dried by azeotropic drying. Most of the by-product HCl from chlorination unit is again sent to hydro chlorination unit and the excess HCl is absorbed in HCl absorption unit. This absorbed HCl and process water formed concentrated hydrochloric acid, which is then stripped in the organic stripper to remove organic matters.

The off-gas containing HCl and Cl_2 are neutralized with NaOH and water. The spent NaOH containing Chloromethane (CMS) mixtures and off-specific CMS are collected and re generated through CMS dryer and sent it to product rectification unit. According to process requirements, exhaust condenser in the hydro chlorination unit, chlorination unit and refrigeration unit adopt R-22 evaporation to exchange heat with the process fluids. In addition to that, storage tanks receive and store concentrated sulfuric acid, dilute NaOH and dilute H_2SO_4 as needed in major process units.

Steam and Condensate recovery system is also provided to recover steam condensate from the plant. Various raw materials required such as Methanol, HCL, NaOH and Sulfuric Acid are stored in separate storage areas. Utilities such as Steam, Nitrogen, raw water and DM water are supplied from the main utility area.

C. TFE, PTFE and PT- PTFE Plants

This plant is to manufacture TFE, PTFE, PT-PTFE and DPTFE using captive available R 22 of about 112 MT/day as the feed stock for the production of TFE and to produce PTFE resin. The annual production capacity on the basis of 300 working days per year is TFE of 7,680 TPA and PTFE of 1650 MT/Month.

The PTFE plant is designed to produce 1650 MT/ Month of Poly Tetra Fluoro Ethylene i.e., suspended middle grain and fine grain PTFE resin. The process is mainly carried out in two stages:

i. Thermal cracking of R-22 with over-heated steam to produced TFE.

ii. Polymerization of TFE with De-ionized water and reduction – oxidizing system to produce PTFE.

The process consists of following sections:

1. TFE monomer metering.
2. Suspension polymerization.
3. Crushing, washing and drying of PTFE.
4. Air- jet pulverization process.
5. Packing and storage.

The PTFE Plant is controlled by DCS to provide an Integrated Plant Control with following associations:

1. Distributed Control System
2. Safety Interlock System

Fresh and recycled Chlorodifluoromethane (R22) is mixed in a vessel and enters into Steam heating furnace and to the Reactor for cracking. Cracked gas is composed of C2F4, HCl, un-reacted R22, excess steam and traces of other cracked products. They enter into a Graphite condenser after rapid cooling in a Quencher. The excess steam and HCl are condensed to form dilute hydrochloric acid and transferred to either neutralization chamber or storage vessel. Uncondensed cracked gas is neutralized and then sent to a buffer tank.

The cracked gas enters into the three-stage compressor unit through a buffer tank, cooler and refrigeration dryer to remove excess moisture. The dry process gas is sent to rectification units for further purification of TFE monomer after de-oxidation process and sent to storage tank through condenser. The un-reacted R 22 from rectification units is recycled to the reaction system. Liquid TFE monomer is sent to Polymerization reactor with de-ionized water after heating, vaporization and compression. The PTFE polymer with mother liquor from reactor is sent for crushing, washing by fresh de-ionized water and drying. Further, PTFE resin is sent, to and dried in the hot air blowing and cold air blowing system and finally it is separated according to its size in a cyclone separator.

post treated PTFE (PT-PTFE) is obtained from following methods depending upon customer requirement. The middle size PTFE resin is fed to air jet mill continuously and smashed by accelerated impact and obtained PT- PTFE's grain size is varying from 10 to100 Microns. Dry PTFE powder is treated in Heating Ovens at various temperatures to get desired quality of PTFE as per Market requirement. Dry powder is treated in Reactor along with water and Perchloro-ethylene at various temperatures to get the properties of free-flowing PTFE powder.

Various raw materials required are TFE, Aqueous alkali, Disodium hydrogen phosphate, Ammonium per sulfate, Sodium bisulfate, Ferrous sulfate, De-ionized water and Silica gel. Utilities such as N2, Instrument Air and Process Air, cooling medium (-15oC CaCl2 Brine, -35oC CaCl2 Brine, -5oC aqueous Ethylene Glycol), Saturated steam, Electricity 3- phase and Compressed air are supplied from the main utility area.

D. Captive Power Plant

GFL has set up a 26MWCo-generation plant, which represents the combined production of heat and power through a c

This plant is designed to produce electric power for captive power requirement, process steam through waste heat recovery boilers using hot flue gases coming out of the gas turbines. In addition to that the plant has been designed to operate its gas turbines with augmented output by means of reducing the sensible heat and partially reducing the moisture in the combustion air through the Vapor Absorption Machines (VAM) of 330 TR capacity driven by the hot engine jacket cooling water. Fuel is natural gas with Methane number greater than or equal to 70.

The minimum and maximum gas pressures for operation are 3.5 and 6 bar (g), respectively. Steam is produced at the net rate of 195000 kg per hour and at a pressure of 12.0 kg/cm2 (g) and temperature of 191°C. Makeup water is added at 65°C and 4 kg/cm2 (g).

E. A & H Plant

Process Description of HCFC R-22 for TFE feedstock

Anhydrous Hydrofluoric Acid, for captive consumption, is manufactured by reacting Fluorspar with a mixture of Sulphuric Acid and Oleum. Wet Fluorspar is fed to the inlet of Flash Dryer. The dry Fluorspar from Cyclone is fed to the Rotary Kiln through the Storage Silo. The Fluorspar, after drying, is fed to the Rotary Kiln along with a mixture of Sulphuric Acid and Oleum, to produce AHF and By-product Gypsum (CaS04) as per the following reaction:

Heat
CaF2 (5) +H2S04(1)> 2 HF(g) + CaS04(s)

The reaction is endothermic and there is no possibility of any run-away reaction.
The Rotary Kiln is indirectly heated by hot flue gases. The Gypsum from the Kiln is neutralized with Lime and discharged as By-product.
The HF vapor is passed through the Kiln Column. The clean HF from the Kiln Column is condensed in HF condensers by means of Refrigeration. The crude condensed HF liquid is fed to the Distillation Columns through Crude HF Storage Tank. Pure AHF is withdrawn and sent to receiving tank after due Analysis.
The entire HF Plant is kept under negative pressure and there is no possibility of leakages of HF from the equipment to the atmosphere.
Raw Materials Anhydrous Hydrogen Fluoride (AHF) and Organic CHCI3 for R-22) are fed to Reactor (01). The Reactor contains special Penta chloride Catalyst which is used to catalyze the reaction between. AHF and Organic to produce Refrigerant gas as per the following reactions:

$CHCl_3$ (I) +2HF(I) >CHCIF2 (g) + 2HCI (g)(R22)

The Crude Refrigerant gases from Reactor enter the Stripper (02) to condense and return unconverted Reactants. CHCl3 to the Reactor.

From Stripper, Crude gas mixture enters HCI Distillation Column (03). Top product of Distillation Column enters HCI Absorption Unit, which consists of Alumina Towers (07, 08), HCI Absorber (09) and Tail

Tower (10). Here, HCI is generated by counter current absorption with water. The bottom product of the Distillation Column (03) enters exchanger where it is mixed with organic and is finally collected into Phase Separator (04). The top layer of the Phase Separator (04) is collected into the AHF Storage Tank (05) and is finally re-fed into the Reactor (01). The bottom layer of the Phase Separator enters Heavies Recovery Column (06). The bottom product of the Heavies Recovery Column (06) is stored into Heavies Tank and is finally re-fed into Reactor (01). The top product of the Heavies Recovery Column enters HF Absorption Column (11) where traces of HF are absorbed into Sulphuric Acid and output of the HF Absorption Column enters into Alkali Towers (12, 13) where the Crude gas is scrubbed with Caustic Soda Trisodium Phosphate. The Crude Gases are then dried in Acid Drying Towers (14, 15) where Moisture, is absorbed by circulating Sulphuric Acid, The bottom product of Non condensable Column enters 1st Distillation Column (20), where R-22 is withdrawn from the top as Final Product, bottom from the Column(20), whichmainlycontainsHighBoilerssuchasR-21andCHCl3isrecycledtotheReactor (01), The Finished Product Refrigerant Gases withdrawn from respective Column tops are then sent to the Daily Storage Tanks. After duly approval of the Quality, the R-22 is sent to final storage for TFE feed stock.
The 32 % HCI obtained from the Absorption Unit is taken to the Storage Tank from where it is sold to Customers. The Spent Liquor from Alkali Tower is taken to Effluent Treatment Plant, for suitable treatment and disposal. The Spent Sulphuric Add from Acid Drying Tower (14, 15) is mixed with Oleum to make up the strength (11) is stored Into Sulphuric Storage Tank T-3107A/B and is finally fed to the Kiln.
Equipment reference no. is mentioned in block diagram of Plant-H.

F. Recovery Plant -1

In the manufacturing of PTFE, TFE is polymerized in DI water with the help of Initiators. Fluoro surfactant is present as the dispersing medium. This Flour surfactant remains in the Latex coming from the reactor. This Fluoro surfactant has to be removed from the Product before it is sent to the market. For this following process is followed.

a. First secondary surfactant (Tegretol) is mixed in this Latex. So that the product becomes stable. This Tegretol is Non-Fluorinated surfactant and can remain in the product as a stabilizer for the product
b. So, after Adding this secondary surfactant the primary surfactant is removed by passing this liquid through ion exchange columns. Where the primary surfactant is captured by ion exchange resin and final product without Primary surfactant goes for further concentration and packaging of the product.
c. Now the resin contains this primary surfactant which has to be removed and to be recycled back to the process.
d. For removing the surfactant from resin solution of Ammonium Chloride 2%, Methanol 70% and water 28% is passed through this column. So, the surfactant get transferred to the is solution
e. This solution now contains mixture of following:

1. Surfactant
2. Methanol
3. Water
4. Ammonium Chloride

Methanol is separated by distillation under vacuum so that the se can be separated and all can be re used and

can be recycled back to process. The methanol recovered has concentration of around 70 to 80 % which cannot be used in the process.

F. $CaCl_2$Plant

Calcium chloride is one of the most versatile of the basic chemicals. It has been produced commercially for well over the years. The properties and characteristics of Calcium chloride make it useful in a large number of applications. Commercially Calcium chloride is produced in following forms. Liquid Calcium chloride is manufactured in concentrations of 20%to45% and it is also available as 32% food grade formulation.

The object this plant is to utilize of Hydrochloric Acid by neutralizing it with Calcium Carbonate. The Calcium Chloride is produced by the reaction of Calcium Carbonate (CaCO3) with 32% Hydrochloric Acid in a Reactor. The resulting 35% Calcium Chloride solution is produced & further it is neutralized with lime to make it free from any acidity. It is also Clarified/ filtered to remove all suspended impurities. The clear Calcium Chloride solution is then can be transferred for further use in evaporation or granulation plant to make anhydrous/ solid material. The Calcium Chloride in the form of powder / granules / flakes are easily transportable & salable in the market in India & abroad.

Process- Calcium Chloride

The Calcium Chloride is mainly produced commercially by Limestone & Hydrochloric Acid reaction. The other production processes such as recovery from by product or naturally available forms are not covered here.

Limestone-Hydrochloric Acid Process

Limestone can be treated with hydrochloric acid to form calcium chloride and carbon dioxide:

$CaCO3+2HCl \quad CaCl2 + CO2 + H2O$

If concentrated (32%) hydrochloric acid is utilized, the concentration of $CaCl2$ in the produced solution will be approximately 32% and further evaporation is only needed when flakes/ granules are produced. The purification of the product is mainly accomplished by adding $Ca(OH)2$ as described in the natural brine process.

$Ca(OH)2+Mg2+ \quad Mg(OH)2 +Ca2+$

The high purity of the produced carbon dioxide ($CO2$) makes it suitable for applications within the food and pharmaceutical industries e.g., in the production of carbonated soft drinks. Extremely pure calcium chloride products can be obtained using this process if the purity of the hydrochloric acid is sufficient. Hence, the process is well suited for producing food grade products. It is also an environmentally friendly method to utilize by-product hydrochloric acid.

Design Basis

The design of the process is based upon the following steps: neutralization of hydrochloric acid with limestone to produce a 35% calcium chloride solution. If required, concentration of the $CaCl2$ Solution to more than 50% using a double effect evaporation system, production of flakes using the flaker, calcinations of the flakes in a rotary calciner to further concentration & packing. Alternatively, 35% calcium chloride solution directly fed to Spray Dryer / Granulation Plant.

Neutralization of HCL

The neutralization of HCL with limestone is carried out as explained above to produce $CaCl2$ and $Co2$ as by product. The $CaCl2$ solution which contains un-reacted solids (impurities from the limestone) settled down in bottom of the Reactors which can be removed by drain Valves / manhole periodically to settling pits. The $CaCl2$ solution which contains un-reacted solids, free acid and Chlorides of other undesirable metals like Magnesium etc. (impurities from the limestone) flows by gravity to Clarifier through retention tank. Milk of Lime Solution is dosed in Reaction Tank wherein the Milk of lime reacts with free acid and other metallic chlorides. The Calcium Chloride solution becomes neutral and other metallic chlorides converted in to metallic hydroxides which are insoluble in water.

Clarification / Filtration:

The neutralized Calcium Chloride Solution impurities get settled down in Clarifier which is continuously containing insoluble impurities. The Flocculent is added in the Solution overflowing from Retention Tank to Clarifier. The undissolved solids get settled down at the bottom of Clarifier which are intermittently discharged into settling pit. The overflow from Clarifier is discharged into Calcium Chloride Solution Storage Tank. The neutralized clear solution Calcium Chloride can be filtered by Inline Polished Filter and transferred for further process of Concentration and granulation. The sludge is filtered in a separate filter Press where the cake builds up on the filter cloth. The filtrate is collected in filtrate tank and the solids are discharged.

CO2 Washing and Cleaning

The CO2 gas is transferred to CO2 Liquefaction Plant for further processing. At CO2 Plant it passes through the Scrubber & demister free of the droplets. The Washed CO2 is then discharged to further processing for Liquefaction & Dry Icing Plant or vent off to the atmosphere.

G. CO_2 Plant

Purifying system

Two lines of CO_2 gas is mixed in buffer tank (V0101) then transferred to washing tower (T0101) to remove the HCl. The washing tower has two stages for washing. First, to wash with circulation water by washing pump (P010A/B), then to purify with primary water, so to ensure HCl content can satisfy requirement. Washing pump is one in run one stand-by. The washing tower level is automatically controlled and can control the washing effect by controlling the level. After washing, the gas goes into separator (S0101) to separate saturate water, and then it is compressed by compressor(C0101A/B).

CO2 gas is compressed to 2.4~2.7 MPa and dehumidified by dehumidifier (E0101), to remove part of water by decreasing temperature, so to increase molecular sieve adsorbing time and enhance the adsorption effect. Dehumidifier (E0101) is cooled by utilizing the vent gas from reflux tank (V0102) and distillation tower (T0105)

Outlet gas from dehumidifier (E0101) is dried by dryer (T0102A/B), inside which we use 3A molecular sieve, and the dryer is one in run one stand-by. When the moisture of molecular sieve is 15ppm, the dryer shall be switched and regenerated. The air is heated by electrical heater (F0101) then blown by a blower (P0102). Hot air passed from the bottom of molecular sieve layer and takes the moisture away. The outlet temperature is 2000C, when the outlet temperature T10102 reaches 1200C or complete regeneration after 30min over 1000C, then stop regeneration process. To cool down the dryer, we use vent gas from dehumidifier (air is not allowed for cooling). To finish the cooling process when the T10102

temperature is ambient, then slightly open the outlet valve of dryer to press and then close for standby.

Dried gas is transferred to pre-rectifying tower (T0103) reboiler (E0102) for heating, part of the inlet gas before reboilering (E0102) goes into bottom of distillation tower (T0105) and heated, then gather with the gas and from the bottom of distillation tower, goes into pre-rectifying tower, where to remove the heavy component in gas. T0103 is cooled and washed by using the liquid from reflux tank (V0102). We control the outlet temperature TICA0106 as - 150C by controlling the liquid level, then the gas pass through absorber (T0104A/B)

Absorber (T0104A/B) can remove the heavy component which cannot be removed by pre-rectifying tower (T0103), and it is one in run one stand-by. Absorber regeneration shall be as per gas component data. Adsorbed is cooled by using the vent gas from dehumidifier (E0101). If insufficient, open the line PG0107A. (Air is not allowed for cooling). The process and parameter is the same as dryer regeneration operation.

Gas from absorber (T0104A/B) is transferred to liquefier (E0103), then to reflux tank (V0102) for primary gas liquid separation. Liquid Co2 in reflux tank divides into two parts, one goes to pre- rectifying tower (T0103) by reflux pump (P0103) and one goes into distillation tower (T0105). Co2 is controlled in distillation tower by level.

The distillation tower is heated by bottom coil; light part is vent from top and high purity liquid Co2 comes out from bottom. After testing, qualified Co2 liquid is transferred to storage tank for filling.

Refrigeration system

The low pressure NH3 gas from liquefier (E0103) goes into NH3 compressor (C0201A/B) and compressed to high pressure, high temperature NH3 gas. Then it is transferred to evaporative condenser (E0201) and changes to normal temperature, high pressure NH3 liquid. The liquid NH3 goes into siphon tank (V0202) and then to storage tank (V0202), and goes back to E0103 for evaporation, repeating the cycle.

Oil is cooled by Liquid NH3 in NH3 compressor (C0201A/B). LNH3 is from the bottom of siphon tank (V0202), GNH3 return to V0202 and then goes into evaporative condenser (E0201), repeating the cycle.

Storage

Liquid CO2 from storage tank is filling into truck by filling pump, to reduce loss in this process and truck gas line can be connected with storage tank gas line (VT0302), to make the gas return to storage tank, further goes back to compressor (C0101A/B).

H. FKM Plant

Hexafluoro propylene and Vinylidene fluoride are the main monomers for producing FKM 2,6 rubber. These two monomers in gas form taken in 02 nos. monomer mixing tanks among which one is dedicated for reactor pressurization and the other is for polymerization. The composition of these tanks is different and maintained as per recipe. After preparation of gas mixture, it is fed to Polymerization reactor by the gas compressor. Reaction pressure and temperature maintained as per recipe value. After feeding the recipe amount of monomer mixture feed is cut off and the reactor is vented till the pressure

comes to atmospheric pressure. During this venting process reactor is also cooled to 30°C by cooling water circulation through reactor jacket. After that latex formed in the reactor is discharged to degassing tank where degassing done by evacuation and nitrogen flushing simultaneously and the latex temperature is further cooled down to 20-25°C. Then after checking viscosity of the latex it is transferred to latex storage tank. It is stored there till the downstream is ready. Then this latex is coagulated in coagulator by adding coagulant into coagulator. By this process polymer gets separated from the latex and it is transferred to washing tank where vigorous washing is done of the polymer. Washing continued till the wash water effluent pH comes above 6.0. Then the material is dumped on to a rubber tank from where the material is loaded on trays after dewatering of the polymer. The trays are then placed inside the tray dryer in which drying of the polymer takes place for 24hrs at 95°C. After drying material is weighed and packed in PPCP drums. These drums are then taken in the close mixer where additives are added for pre compounding and thereafter the material is turned into a sheet in a two-roll mill. After that sheet is cut and placed on trays for cooling (cooling is required as the material is heated up during the process of mixing and sheeting). When the sheet temperature brings down to ambient temperature then this sheet is packed in the packing boxes as per requirement.

❖ **ETFEE Plant**

Manufacturing of E-TFEE Product Using Reaction Between 18% Ethanolic-KOH Solution & TFE Gas. The process for the ETFEE production consists of 3 steps:

1) Unloading of the Raw material into storage tanks: One of the raw materials used in the manufacturing of ETFEE is 18% KOH in Ethanol. This will be supplied to the plant by tankers which are to be unloaded into tank in an approved tank farm area.

2) Reaction: The Ethanolic KOH reacts with TFE to give the ETFEE at a temperature of 50 ± 2°C. The process steps involve

    1) Pumping a fixed quantity of the Ethanolic KOH into the reactor.
    2) Cooling the mass and qualifying the reactor to make it oxygen ree.
    3) Feeding the required quantity of TFE at a fixed rate and allowing the reaction to take place in controlled conditions.

4) Post completion of the reaction, water addition for solid dissolution, cooling the mass and evacuating the residual gases safely. Typical batch cycle time is 8hours.
5) After evacuation, the batch is transferred to a hold vessel and thereafter to the designated tank in approved tank farm.

3) Loading of Product into tanker: The crude product made in the process is sent via tankers to Ranjit Nagar facility for purification and ethanol recovery.

J. R-125 (Penta Fluor ethane)

The process includes CO removal, raw material metering, reaction, compression, distillation, drying, recovery, HFC-125 metering and storage. Refer to P&ID (BD1601-301 ～312) for details.

5.2.1 CO Removal

The gas from LV-1 MSU of TFE plant, under normal temperature and pressure of1.3kg/cm2 enter to the pre-buffer tank (V-6801), then it is cooled to 15 ℃by pre-cooler (E-6801). It is pressurized to 6 kg/cm2 by diaphragm compressor (C-6801), pass through the after cooler (E- 6802) cooled to 25 ℃, then go into the after-buffer tank (V-6802). The gas enters the CO absorption tower (T-6800) in countercurrent contact with the solvent (acetic acid copper ammonia solution), the tower top gas go to the mixture buffer tank (V-6809) after ammonia removal through ammonia washing tank(V-6830) and the decompression of control valve. The CO- contained liquid after decompression of control valve at the tower go to the upside of reflux regeneration tower (T-6801). The structure of reflux regeneration tower is refluxing section in the upper, regeneration section in the middle and reducer at bottom. After deamination in water washing tank (V- 6805), the CO- contained exhaust gases from reflux section top go to the waste gas tank (V-6825) for pressure stabilization, then it is pressurized by the blower (C-6803A / B) and sent to incineration. The liquid from regenerator is first cooled by cooling water cooler (E - 6806) and then pumped by solvent recycle pump (P- 6801A / B) to solvent cooler (E-6804) cooled up to 15 ℃, then go to CO absorption column (T- 6800). If the copper ratio is too high in the solvent, add compressed air to the reducer section to regulate the ratio. If total ammonia is too low in the solvent, add ammonia downstream of cooling water cooler (E-6806). If the total copper is too low, solvent out of the regenerator pass by solvent preparation tank (V- 6803) to adjust the total copper. Set solvent collection tank (V-6804) collect copper solvent emissions during shut down and maintenance. 5.2.2 Reaction (BD1601-305～306)

5.2.2.1 Catalyst preparation

Add certain quantity of TBA in reactor (R-6841A/B) and start catalyst circulation pump (P-6844A~C) to make the liquid circulate. Add certain quantity of HF gradually by HF metering pump (P6841A~C) to form complex with TBA and the temperature is controlled by the circulating condensate in jacket. The catalyst is qualified when the mole ratio of HF to TBA reach to1.5~1.9:1.

5.2.2.2 Reaction TFE gas from TFE distillation tower(T-606) side and bottom in TFE plant and the recovered from downstream distillation system is mixed and continuously fed into the TFE stabilizing tank (V-6844). It is heated and mixed with TBA in TFE heating tower (T-6841) and then fed into reactor (R- 6841A/B) through TFE buffer tank (V-6845). The AHF is fed into reactor by HF metering pump (P-6841A~C) after metering. Catalyst continuously circulates in reactor through catalyst preparation tank (V-6849A/B). TFE gas monomer and AHF are continuously fed into reactor to generate crude product HFC-125 under certain temperature and pressure. Crude HFC-125 gas comes out from reactor top and goes through demister cooler (E-6842) to reflux tower (T-6809) to reduce temperature. Then it goes to mixture buffer tank (V-6809) through reflux tower condenser (E-6829) for cooling.

5.2.3 Mixed gas collection, compression, dehydration and deoxidization (BD1601-307～310) TFE recovered from D-PTFE through D-PTFE buffer tank (V-6806) and TFE recovered from S-PTFE through S-PTFE buffer tank (V-6807) for pressure adjustment, then go to the mixture buffer tank (V-6809); Other continuous vent raw gas together with recovered gas emissions from distillation system go into the mixture buffer tank (V-6809).All these gas are mixed with crude HFC-125 from reflux tower. The mixture gas is compressed by the compressor (C-6802A/B), first stage outlet gas enters into the dehydrating tower (T- 6802A/B) after cooling and dehydration by cooling dehydrator (E-6807A/B). It is cooled to -10 ℃ by low temperature dehydrating agent and continued dehydrating, then into the secondary buffer tank (V-6810), then go into the compressor for second-stage compression; Second stage outlet gas is cooled by secondary cooler (E-6809) then go into the dryer (A-6801A ~C), silica gel adsorbed water from the gas, make the gas moisture content less than 100ppm.Then it go to deoxidizing tower (T-6803) remove O2 . If the moisture content of the gas close to 100ppm changes over the dryer, and the block up dryer is activated by steam heating and vacuuming. The polymerization inhibitor terpene via terpene metering tank (V-6813), terpene pump (P- 6803A / B) is supplied to the deoxidizing tower (T-6803), Make up terpene to NO.1 condenser (E-6812) by terpene make-up pump (P-6804A / B) on a regular interval and quantitative. 5.2.4 Distillation system (BD1601-310～312) Gas from the top of the deoxidizing tower (T-6803), passing through feeding cooler (E- 6810), enters No.1 rough separation tower (T-6804). TFE is recovered from sideline to TFE stabilizing tank (V-6844). Distillates from the top of No.1

condenser (E-6812), which contains NCG like R23 is sent to waste gas mixing tank (V- 6826). Trace of TFE, R32 and large quantity of HFC-125 left at the tower bottom are continuously sent to No.2 light fraction removal tower (T-6805) by discharge control valve . Light components (including trace of R32, Y3, TFE) with boiling points lower than HFC-125 are rectified from top of No.2 light fraction removal tower (T-6805) passing through the terpene tank (V-6815) and No.2 condenser (E-6815) enter into the waste gas mixing tank(V-6826). HFC-125 from bottom of No.2 light fraction removal tower goes to No.3 distillation tower (T-6806). The side-cut gases HFC-

5.2.4 125 from top of No.3 distillation tower (T-6806) is sent to product metering tank(V- 6846A/B) through collection condenser(E- 6826). The gas contain HFC-125 and trace of Y3 at No.3 condenser (E-6818) top recycle back to mixture buffer tank(V-6809).Materials at tower bottom intermittently go into recovery tower (T-6808). Higher purity HFC-125 from top of No.5 recovery tower (T-6808) goes back to mixture buffer tank(V-6809). Liquid at tower bottom are high-boiling residues. They are discharged to residue tank (V- 6816). The residues are compressed into steel cylinder at regular intervals and sent out of battery limit to incineration unit for disposal.

5.2.5 Product storage and filling system, and tail gas scrubbing and absorbing syste （BD1601- 310～312） When the HFC-125 in product metering tank (V-6846A/B) is qualified after analysis, it can be pumped to product storage tank (V-6847) in tank field for periodical tank wagon and cylinder filling. If the moisture is not qualified, it should pass HFC-125 dryer (A-6841A/B) for drying until the moisture is qualified, then it can be pumped to tank field. If the purity is not qualified, the gas should be recovered back to mixture buffer tank (V-6809). Qualified HFC-125 is pumped by product transfer pump (P-6848A/B) through product storage tank (V-6847) to tank wagon or cylinder. If the moisture is not qualified, it should pass product dryer (A-6842A/B) for drying until the moisture is qualified. The tank wagon and cylinder and related pipeline should be treated by vacuum before filling.

5.2.6 Three waste treatment Liquid waste is discharged to liquid waste pit (V-6820), and regularly sent to ETP for treatment by liquid waste pump (P-6811A/B).（BD1601-313） Liquid at recovery tower bottom are high-boiling residues. They are discharged to residue tank (V- 6816). The residues are compressed into steel cylinder at regular intervals and sent out of battery limit to incineration unit for disposal.（BD1601- 312） Waste catalyst in waste catalyst tank (V- 6848) is stored in steel drum and regularly sent qualified third party for treatment.（BD1601- 306） All Fluoro-contained waste gas vent from plant is collected into waste gas mixing tank (V- 6826) and sent to OSBL for incineration. （BD1601-304 The acid gas from HF tanks is washed by scrubber (T-6842) and high vent. The washing liquid is discharged to liquid waste pit.
BD1601-313） Waste silica gel and molecular sieve are nontoxic and landfill. Condensate is collected from users into condensate collecting tank(V-6819) and mainly sent to reactor(R- 6841A/B) jacket for circulation and part is transferred OSBL. （BD1601-313）
The heating medium systems is for No.2 reboiler (E-6814), No.3 reboiler (E-6817) and residue tank (V-6816) heating. It contains heating medium tank (V- 6817) and heating medium pump (P-6808A / B) heating medium heat exchanger(E-6843). （BD1601-313）
The vacuum system consist of vacuum buffer tank(V-6818), vacuum pump(P-6809A/B). It can be expanded as per actual requirement. （BD1601-309） Where there is a high concentration of TFE, and for equipment or pipeline which is easy to explosive, safety relief facilities must be set.

K. VDF Plant

- Cracked gas enters the primary buffer tank from atmospheric pressure gas storage after single-stage compression, then dewatered by water calcium chloride tower after drum, then through the mist eliminator and cold removal, and enters the intermediate gas storage. It enters the secondary buffer tank after two-stage compression and reaches the intermediate tank after silica gel absorber drying and pre-/mid-/end cooling.
- The liquid phase of intermediate tank is discharged into the catcher and enters # 1 tower, low boilers on the top # 1 tower enter acetone absorption tower and then discharged into drum. Tower bottom enters # 2 tower, VDF at the top of tower enters finished product metering tank after liquefaction by collecting condenser. Tower bottom enters # 3 tower to continue fractionating and recover VDF. Liquid at the tower bottom enters # 4, remove low boilers from the tower top. Bottom material enters # 5 tower, F142b at the tower top enters F142b tank after collection, place the bottom liquid into residue tank.

3.3 PROCESS & SAFETY RELATED DATA FOR INDIVIDUAL PROCESS STAGES

SN	Name of the Plant, Department or Place	Name of the hazardous process and operation	Material in the process /operation with their quantity	Name of the vessel and its location	Operation parameters: pressure, temperature etc.	Type of hazards possible (exothermic, run away, pressure release, toxic release, fire explosion etc.	Control measure provided	In charge Person	
								Name and Designation	Telephone Number
1.	CA	Electrolyzing	Hydrogen, Caustic & Cl_2	Electrolyzer	Pressure, Temperature, Flow	Explosion, Cl2 leakage & Caustic Splash	DCS control with Interlock, Gas detector alarm	HOD	8106
2.	CA	Cl2 Washing & Drying	Cl_2	Cl_2 Cooling & Washing Tower	Pressure, Temperature	Cl2 Leakage	DCS control with Interlock, Gas detector alarm	HOD	8106
3.	CA	H2 Washing	H2	H2 Washing Tower	Pressure, Temperature	Explosion	DCS control with Interlock, Pressure Relief Valve	HOD	8106
4.	CA	H2 Compression	H2	H2 Compressor	Pressure, Temperature	Explosion	DCS control with Interlock, Gas Detection System,	HOD	8106
5.	CA	Caustic Concentration	Caustic	Evaporation Unit	Pressure, Temperature Flow	Caustic Splash	DCS control with Interlock	HOD	8106
6.	CA	Cl2 Liquefier	C2	Liquefier	Pressure, Temperature	Cl2 Leakage	DCS control with Interlock, Gas detector alarm	HOD	8106
7.	CA	Cl2 Vaporizer	Cl_2	Vaporizer	Pressure, Temperature	Cl2 Leakage	DCS control with Interlock, Gas detector alarm	HOD	8106

8.	CMS Plant	Chlorination	Methanol l and HCL as per plant load	Hydro chlorinator	Flow, Temperature, Pressure	Leakage/ rupture in the out let pipe	Interlocks connected to DCS to Monitor parameters	HOD	8131
9.	CMS Plant	Stripping	Chloromethane as per plant load	Organic Stripper	Temperature	Leakage through nozzles, gaskets, flanges etc. due to unavailability/failure of cooling water	Interlocks connected to DCS to Monitor parameters	HOD	8131
10.	CMS Plant	Absorption	HCl, Caustic soda and water asper plant load	HCl absorber	Flow, Pressure	High pressure/ levels	Interlocks connected to DCS to Monitor parameters	HOD	8131
11.	CMS Plant	Quenching	Chlorom ethane, HCl and water as per plant load	Quenching and dehydrating system	Flow, Temperature	Leakage in the reactor outlet pipe/ Rupture in bellow EX2104	Interlocks connected to DCS to Monitor parameters	HOD	8131
12.	CMS Plant	Chlorination	Methyl chloride and chlorine as per plant load	Thermal chlorination section- CH3Cl distillation section	Pressure, Temperature, Flow	Closure of manual valves, Malfunctioning of LIA2307	Interlocks connected to DCS to Monitor parameters	HOD	8131
13.	TFE Plant	Combustion	Natural gas and steam	Back firing furnace	Flow, Temperature	Explosion and Fire	Interlocks connected to DCS to Monitor parameters	HOD	8290
14.	TFE Plant	Condensation	Tetra Fluoro Ethylene	TFE Condenser Steam	Flow, Temperature, pressure	Explosion	RCC Explosion proof covering to reactor	HOD	8290
15.	TFE Plant	Thermal Cracking Tetra fluoroethylene	Chloride fluoromethane	heated Furnace & Cracking	Pressure, Temperature	Explosion	RCC Explosion proof covering to reactor	HOD	8290

16.	TFE Plant	Distillation	hydro carbons	stillation tower	Temperature, Pressure	Explosion	RCC Explosion proof covering to reactor	HOD	8290
17.	PTFE Plant	MMT, MST, Condense Process	Tetra fluoro Ethylene ,	MMT, MST, Condense Process	Pressure, Temperature	Explosion & Self Polymerization	RCC Explosion proof covering to all reactors, DCS Monitoring & Field Observations	HOD	8274
18.	PTFE Plant	Polymerization	Tetrafluoro Ethylene, de-ionized	Reactors & Silica Gel	Pressure, Temperature,	Explosion, Run Away Reaction	Interlocks connected to DCS to Monitor parameters , RCC Explosion proof	HOD	8274
19.	Power Plant	Steam Generation	Natural Gas, Hydroge n & Coal	Boiler	Pressure, Temperature	Explosion	Pressure Relief Valve, Temperature & Pressure Indicator	HOD	8146
20.	AHF	Combustion, Reaction, Condensation , Distillation	Natural Gas, Hydrofluoric Acid, Sulfuric Acid, Oleum Acid, Chloroform, Chlorfluoro Methane	Kiln, Associate, Striping Colum n, Distillation Colum n, Reactor, Stripper, Distillation Tower	Flow, Temperature , Pressure,	Toxic release, fire explosion	Interlocks connected to DCS to Monitor parameters, Back End Scrubber, Dump Tank, Centralized Scrubber	HOD	8306
21.	FKM	Polymerization	TFE, HFP & VDF	React or	Pressure & Temperature	Toxic release, fire explosion	Interlocks connected to DCS to Monitor parameters , RCC Explosion proof Separation wall, Field Observation Interlocks connected to DCS	HOD	8193
22.	E- TFEE	Polymerization	Ethanoic KOH & TFE	React or	Pressure & Temperature	Toxic release, fire explosion	to Monitor parameters , RCC Explosion proof Separation wall, Field Observation	HOD	8193

3.4 SAFETY RELATED TYPE OF UTILITIES

Sr. No.	Description	Capacity
1.	Boiler GT-6041	Boiler Rating :3,518.00 m^2
2.	Boiler GT-8091	Boiler Rating :4,324.00 m^2
3.	Boiler GT-6488	Boiler Rating :7,958.00 m^2
4.	Boiler GT-6472	Boiler Rating :7,958.00 m^2

Following safety System has been installed in general for all above Utilities.

1. Fire Hydrant line installed.
2. Adequate numbers of Fire Extinguishers have been installed. Maintenance is being done quarterly and visual inspection is done every month.
3. Trained and competent person employed for the boiler operations and first class boiler operators are available at site.
4. Preventive maintenance of utility system in place and records are available with maintenance.
5. On- site Emergency plan is prepared and mock drills are conducted.
6. Boiler interlocks are in place for its safety.
7. Tripping at high steam pressure.
8. Double Safety valves were provided.
9. For electrical safety ELCB is provided for all lightings and adequate numbers of Lightening Arrestors are installed on Buildings as per requirements and each arrestor has two different earth pits.
10. Critical instruments loop testing details are maintained. Records are maintained and available with concern person.

Sr. No.	Name of the possible Hazard or Emergency	Its Source & Reasons	Its effect on Persons, Property & Environment	Control Measure
1.	2.	3.	4.	6.
1.	Electricity 1. Burning 2. Shock 3. Fire	• Loose contact of wires • Weak earthing • Short Circuit • Improper Insulation	• Person & Property	• Regular inspection of electrical fitting • Flame proof fitting provided in flammable area • Proper earthing • Electrical installation has been done as per hazard area classification.
2.	Air Raid	War	• Death • Fire. • Explosion. • Property Damage.	• On-site & off site emergency plan prepared. • Mock drills are conducted on regular basis. • Help of mutual aid And off-site emergency plan is available as required.
3.	Earthquake	Natural	• Death • Injury • Property Damage.	• On-site & off site emergency plan prepared. • Mock drills are conducted on regular basis. • Help of mutual aid and off-site emergency plan is available as required. • GSDMA help is also available from District collector office.
4.	Floods	Natural	• Death • Injury • Property Damage.	
5.	Cyclone	Natural		
6.	Sabotage	Human		

CHAPTER – 4: DESCRIPTION OF HAZARDOUS CHEMICALS

4.1 CHEMICALS (QUANTITIES, SUBSTANCE DATA, ON PHYSICAL & CHEMICAL PROPERTIES, SAFETY RELATED DATA ON EXPLOSIVE LIMITS, FLASH POINT THERMAL STABILITY, TOXICOLOGICAL DATA AND THRESHOLD LIMIT VALUES, LETHAL CONCENTRATIONS)

Sr. No.	Name of chemical	CAS No.	Physical & chemical Data of the chemical							Fire & Explosion Hazardous Data of Chemical				Toxicological Data		
			Molecular weight	Melting Point °C	Boiling Point °C	Vapour Density	Vapour Pressure	Specific gravity	State	Flash point	AIT °C	LEL (%)	UEL (%)	TLV	LD50	LC 50
1.	Caustic Soda	1310-73-2	40	323 Deg C	1388 deg C	NA	1.82X10-21 mm Hg at 25 deg C	2.13 g/cu cm 25 deg C	Liquid	Not flammable	Non-Flammable	Not explosive	Not explosive	Ceiling Limit: 2 mg/cu m.	Rabbit dermal 1,350 mg/kg	160000 ug/L for 24 hr
2.	Oleum-$H_2O_7S_2$	8014-95-7	178.14	2 °C	138 °C	3.39	253 hPa at 20 ° C	1.992	Cloudy Fuming liquid	Not applicable	Not applicable	Not applicable	Not applicable	0.2 mg/ m3	2140 mg/k g	347 ppm
3.	Hydro chloric Acid-HCL	7647-01-0	36	-62.25°C	108.58 °C	N/A	16 KPa	1.1-	liquid	N/A	N/A	N/A	N/A	5 ppm	5 ppm	0.25 to 10 ppm
4.	DEA ($C_{10}H_{15}N$)	537-46-2	149.23 g/mol	170-2 °C	212 °C	NA	13	NA	liquid	84	385	1.1	5.3	NA	606 mg.kg- 1	1 920 mg.m-3/4 h
5.	Ammonia NH3	7664-41-7	17 g/mol	-77.7 °C	-33 °C	0.5967 (Air = 1)	860 KPa	0.696 g/L (liquid)	Gas.	N/A	630 °C	16%	25%	25 ppm	NA	7338 ppm/1h
6.	Hydrogen	1333-74-0	2 g/mol	-259.2 °C	-252.9 °C	0.07	No data available	0.0696	Gas	-149.9	566 °C	4%	77%	NA	NA	15000 ppm/1hrs
7.	Methanol	67-56-1	32.04 g/mol	-97.8°C	64.7	1.11	12.3 kPa	0.791	Liquid	11	464° C	LEL- 6%	36.5 0%	200 ppm	15800 Rabbit	64000 ppm/4H

8.	MCB	108-90-7	112.557	(-45.2 deg C)	132 °C	3.88	8.8mm	1.1058	Liquid	29.44 °C	638 °C	LEL 1.3%	UEL 7.1 %	10 ppm.	1110 mg/kg [Rat]	N.A
9.	Mono Chloro Benzene	108-90-7	112.56 g/mol	-45.6 °C	132 °C	3.88	15.7 hPa (11.8 mmHg) at 25.0 °C (77.0 °F)	1.1058	Liquid	29.44 °C	638 °C	1.30 %	7.10 %	10 ppm	1110 mg/kg [Rat]	N.A
10.	Nitric Acid (61%)	7697-37-2	63.01 g/mol	-41^{0}C	121.8 °C	2.17 (air=1)	51 mm Hg @ 25 deg C	1.4	Liquid	NA	NA	NA	NA	TWA: 2 ppm	NA	2500 ppm. (Rat) 1h
11.	Sodium Acetate	127-09-3	82.03 g/mol	324^{0}C	NA	NA	NA	1.528	Dry Powder	> 250 °C	600^0 C	NA	NA	TWA: 3 mg/m^3	Oral Rat LD50: 5200 mg/kg	Inhalation Rat LC50: > 30,000 mg/m3 1 Hr.
12.	Chlorine	7782-50-5	71 g/mol	-101 °C	(-34 °C)	2.4	6.8 bar(a)	1.4 @ 15.6 °C	Gas/ Liquid	Not flammable	Not applicable	NA	NA	TWA: 0.1 ppm	5800 mg/kg (Rat)	293 ppm (1-h Rat)
13.	Tri Ethyl Amine (TEA)	121-44-8	101,19 g/mol	(-115 °C)	89 °C	3,49	69.6 hPa	0.728	Liquid	-15 °C	no data avail	1.2	8	TWA: 1 ppm	LD50 Oral: 460	1250 ppm (Rat) 4 h
14.	Sodium Hypo Chloride	7681-52-9	74.44 g / mol	-20 °C	40^{0}C Decomposer slightly	1.07 – 1.14	approx. 25 hPa at 20 deg. C	1.126	Liquid	NDA	NA	NA	NA	0.5 ppm as Cl2	Dermal LD50-10,000 mg/kg in rabbits	Inhalation 0.25-hour LC50 - 10.5 mg/L in rats
15.	Sodium Sulfite solution	7757-83-7	126.04 g/mole	Decomposition temperature: >500°C	Not available	Not available	Not available	2.63 (Water = 1)	solid	Non-Flammable	NDA	Not explosive	Not explosive	Not available	ORAL Acute: 820 mg/kg [Mouse.] 3650 mg/kg [Rat]	660 mg/l - 96 h

16.	Sodium Carbonate	497-19-8	105.99 g / mol	851 °C	1,600 ° C	2.5 g/cm³-density	NA	NA	Solid	Non-Flammable	Non-Flammable	Not explosive	Not explosive	NA	(Oral) - 714 mg/kg,	Mouse : LC50 (Inhalation) - 1200mg/m3/2h
17.	Hydrochloric Acid	7647-01-0	36	-46.2°C	50.5 °C	1.267	16 KPa	1.19	liquid	N/A	N/A	N/A	N/A	2 ppm (Ceilin g)	700 mg/kg	3124 ppm/1 hr
18.	Sulphuric Acid	7664-93-9	98.08	-32°C (93%)	290°C	3.4	1,33 hPa at 145,8	1.84	liquid	Non-Com	N/A	N/A	N/A	3 mg/m3	2140 mg/kg	510 mg/m3/2
19.	Ethanamine, N,N-diethyl	121-44-8	101,19 g/mol	(-115 °C)	89 °C	3.49	NDA	0.728	L	-8.3	215 °C	1.2	8	TWA: 1 ppm	460 mg/kg (Rat)	1250 ppm (Rat) 4 h
20.	Ethylenediamine Tetra acetic Acid	60-00-4	292.25 g / mol	220 deg C	Not available	Not available	Negligible	0.86 @ 20C	Crystals	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	mouse: LD50 = 30 mg/kg	129-159 mg/L; 96Hr
21.	Di chloro Methane	75-09-2	84.93 g / mol	-97 ° C	40 ° C	2.93 - (Air = 1.0)	470,9 hPa at 20,0 °C	1.33	L	NA	605 ° C	13	23	TWA: 50 ppm	> 2000 mg/kg (Rat)	53 mg/L (Rat) 6 h
22.	Ammonium hydroxide	1336-21-6	35.1 g / mol	-2.9 ° C	37.7 ° C	0.9939 g / cm³	153 hPa at 20 °C	0.89	L	NA	651 ° C	0.16	0.27	25 ppm	350 mg/kg	0.16 - 1.1 mg/l (LC50; 96 h)
23.	Ethyl Acetate	141-78-6	3.66 mg / m³	-83 ° C	77 ° C	3.04	97,3 hPa at 20,0 °C	NA	L	-4.4	470 ° C	2	12.8	400 ppm	4100 mg/kg	45000 mg/m3
24.	Calcium hydroxide	1305-62-0	74.09 g / mol	580°C	Decomposes	2.24 g/cm3 at 25 oC	NDA	2.24	S	NDA	NDA	NDA	NDA	5 mg/m3	7340 mg/kg	NDA

25.	Chloroform (CHCL3)	67-66-3	119.38 g/mol	-62.99 °C	61.0 °C	NDA	NDA	NDA	L	NDA	NDA	NDA	NDA	NDA	LD50 Dermal - Rabbit - > 20.000 mg/kg	LC50 - 162 mg/l - 48 h
26.	Carbon tetra chloride (CCL4)	56-23-5	153.82 g/mol	-23 °C	76 - 77 °C -	NDA	45 hPa at 0,3 °C	NDA	L	does not flash	NDA	NDA	NDA	NDA	LD50 Oral - Rat - 2.350 mg/kg	Mortality LC50 - fish - 24,3 mg/l
27.	Copper acetate monohydra te	6046-93-1	199,65 g/mol	115 °C	NDA	NDA	NDA	NDA	S	NDA	NDA	NDA	NDA	NDA	LD50 Oral - Rat - > 300 - < 2.000 mg/kg	- 0,39 mg/l - 96,0 h
28.	Copper, powder or dust	7440-50-8	63.55 g/mol	1.083 °C	2.567 °C	NDA	NDA	NDA	S	NDA	NDA	NDA	NDA	TWA: 0.2 mg/m3	LD50 Intrape ritoneal - Mouse - 3,5 mg/kg	0.73 mg/l (male rats)
29.	Sodium bicarbonat e	144-55-8	84.01 g/mol	300 °C	NDA	NDA	NDA	NDA	S	NDA	NDA	NDA	NDA	NDA	LD50 Oral - Rat - 4.220 mg/kg	rabbit, eye: 100 mg/30S Mild
30.	Sulfolane	126-33-0	120.17 g / mol	27.4 - 27.8 °C	285 - 288 °C	NDA	0.035 hPa @ 30 °C	1.2	S	165 °C	528 °C	NDA	NDA	NDA	LD50 = 1941 mg/kg (Rat)	LC50: = 1930 mg/L, 96h

31.	Chloroben zotrifluori d e	98-56-6	180.56 g/mol	-36 °C	136 - 138 °C	6.23	38.6 mbar @ 50 °C	1.350	L	43 °C	650 °C	NDA	NDA	TWA: 2.5 mg/m3	LD50 = 5546 mg/kg (Rat)	LC50 = 3 mg/L, 96h semi-static
32.	2,6-Dichlro-4-trifluoromet ylaniline	2427 9-39-8	230.01 g / mol	34-37°C	60-62°C/1 mm	N/A	N/A	N/A	L	88 ° C	N/A	N/A	N/A	N/A	N/A	N/A
33.	Hydrogen Fluoride	7664 -39-3	20.00 g / mol	-83.37 ° C	19.5 ° C	2.21	1.0314 bar at 20 deg. C	1.15-1.20	L	NDA	NDA	NDA	NDA	TWA: 0.5 ppm	NDA	LC50 = 0.79 mg/L
34.	Calcium sulphate	1339 7-24-5	172.171 g/mol	1450 °C	NDA	NDA	NDA	2.3	S	NDA	NDA	NDA	NDA	TWA: 15 mg/m3 (Total)	3000 mg/kg (Rat)	NDA
35.	Chlorotrifu oroethylee	79-38-9	116.47 g / mol	-158.2 °C	-27 °C	4.0	5.66 bar at 20 deg. C	1.305 g/ml (@ 20 °C)	L	-27.8 °C	NDA	8.4	38.7	NDA	268 mg/kg oral-mouse	1000 ppm/4h
36.	Tetra fluoro ethylene	116-14-3	100.02	-142	-76	3.9	at 20 °C: 2947 KPa	1.5	G	<0 °C	188 °C	10	50	TWA: 2 ppm	NDA	40000 ppm/4 hour(s)

4.2 THE FORM IN WHICH THE CHEMICALS MAY OCCUR OR INTO WHICH THEY MAY BE TRANSFORMED IN THE EVENT OF ABNORMAL CONDITIONS

No	Name of the Chemicals	Original Form	Form in the Abnormal Condition
1.	Chlorine	BP of this chemical is (-34 °C) hence this chemical in its pure form remains as Gas Only.	Chlorine will not decompose and will not produce any decomposition products. In case of leakage--- 1. Chlorine is hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation (lung irritant). 2. Chlorine is hazardous slightly hazardous in case of skin contact 3. Chlorine is Non-sensitizer for skin. Corrosive to skin and eyes on contact. Liquid or spray mist may produce tissue damage particularly on mucous membranes of eyes, mouth and respiratory tract. 4. Skin contact may produce burns. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath.
2.	Methanol	BP of this chemical is 64.7 °C hence this chemical in its pure form	• Mixtures of methanol vapor and air are explosive. • Lower explosive (flammable) limit in air (LEL), 6.0%; upper explosive (flammable) limit in air (UEL), 36%. • Agent presents a vapor explosion and poison (toxic) hazard indoors, outdoors, or in sewers. • Run-off to sewers may create an explosion hazard. • Containers may explode when heated.

3.	Dichloro Methane	BP of this chemical is 40 °C hence this chemical in its pure form in normal condition	• Harmful by inhalation. • Vapours may cause drowsiness and dizziness. Inhalation of high vapour concentrations can cause CNS- depression and narcosis. Severe overexposure may produce more • serious symptoms, including coma and risk of kidney damage.
4.	Oleum	BP of this chemical is 150 °C hence this chemical in its pure form in normal condition	• A very dangerous fire hazard by chemical reaction with reducing agents and carbohydrates. • Sulfuric acid and oleum are non- flammable liquids, but they can cause or support a fire by reacting with other chemicals. • Risk of fire and explosion on contact with base(s), combustible substances, reducing agents or water.

4.3 THE DEGREE OF PURITY OF THE HAZARDOUS CHEMICAL WITH STORAGE QUANTITY AND NATURE OF HAZARD

Sr. No.	Name of Material	Max. Qty. stored	State	Nature of Storage	Nature of Hazard					Type of Emergency	Response Procedure
					F	E	T	C	Ca		
A.	Caustic Soda lye	247 M^3	L	Tank	--	--	H	H	--	Corrosive and toxic chemical release in the plant battery limit	Cover by lime or dry sand and discard it to authorized landfill site.
B.	Chlorine	316 M^3	L	Pressure vessel	M	--	H	L	--	Toxic gas dispersion in wind direction will take place.	Activate ON site plan and act accordingly. Control leak by Chlorine emergency kit, FRP hood and scrubber assembly.
C.	HCl	30 MT	L	Tank	--	--	H	H	--	Corrosive and toxic chemical release in the plant battery limit	Cover by lime or dry sand and discard it to authorized landfill site.
D.	H_2SO_4	50 M^3	L	Storage Tank	--	--	H	H	S	Corrosive and toxic chemical release in the plant battery limit	Cover by lime or dry sand and discard it to authorized landfill site.

ABBREVIATIONS		
Sr. No.	Acronym	Full Form
1	**F**	Flammable
2	**E**	Explosive
3	**T**	Toxic
4	**C**	Corrosive
5	**S**	Slight
6	**H**	High
7	**M**	Moderate
8	**G**	Gas
9	**L**	Liquid
10	**Ca**	Carcinogenic

CHAPTER – 5: INFORMATION ON PRELIMINARY HAZARDS ANALYSIS

5.1 TYPE OF ACCIDENT

1. **Fires & Explosion:**

   This includes hazards like unwanted combustion of materials, leakages and bursting of equipments with high noise, lights due to release of pressure due to accumulation of VOC and external head, leading to a risk of property damage and injury.

   Electrical fires occur due to sort circuiting and weak insulation. Chemical Fire and explosion is also taking place due to static charges, open flame, spark, incompatible reactions etc. Many Hazardous chemicals like 2- Propanol, Tetra Fluoro Ethylene, Chloro Tri Fluoro Ethylene, Ethaneamine etc. & Processes cause Major Accidents.

2. **Toxic release:**

   This includes hazards like toxic gas release from source or spillage of certain chemicals, leading to risk of exposure to the human.

   Sudden quantity of liquid Chlorine, Carbon tetra chloride has potential to cause loss of life and damage to property at a greater distance away from the point of release.

3. **Chemical burns:**

   Chemical like Hydrochloric Acid, Sulfuric Acid, Chlorine, Caustic Soda lye are highly corrosive in nature, sudden release/splashes of these chemical due to leakage/Rupture of equipment may cause serious chemical burn injury upon contact to the people working in the plant area. Severity of these chemical burns depends upon the concentration of chemicals and period of contact.

5.2 SYSTEM ELEMENTS OR EVENT THAT CAN LEAD TO MAJOR ACCIDENTS

(1) Inadequate design against internal pressure, external forces, corrosion and temperature.
(2) Toxic gas release.
(3) Mechanical failure of Pipes, Vessels, elbows due to corrosion, erosion, impact, liquid expansion, weld failure etc.
(4) Failure of manual / automatic control system.
(5) Unsafe operation / maintenance including wrong operation of valve, mixing or overflowing of liquid chemicals.
(6) Leakages and spillage of flammable material.
(7) Uncontrolled vehicle movement.
(8) Any source of Ignition to flammable liquid may be the reason of emergency.
(9) Tanker loading/unloading operations in limited space areas.
(10) Change control procedure and documents update for process safety information and PHA.
(11) Multiproduct facility with varying chemicals use for short duration.
(12) Power outage.

The conditions of events which could be significant in bringing one about:

Sr. No.	Type of Accident/Occurrence	Probable Reasons
1.	Fire & Explosion	Inadequate design against internal pressure, external forces, corrosion and temperature.
		Mechanical failure of Pipes, Vessels, & elbows due to 1. Corrosion & Erosion, 2. Impact, liquid expansion, weld failure
		Failure of manual / automatic control system.
		Unsafe operation / maintenance including wrong operation of valve, mixing or overflowing of liquid chemicals.
		Uncontrolled vehicle movement.
		Any source of Ignition like Matchbox, Mobile, Welding, Cutting, etc.
2.	Toxic Gas Leakage &Toxic Chemical Spillage	Inadequate design against internal pressure, external forces, corrosion and temperature.
		Failure of manual / automatic control system.
		Mechanical failure of Pipes, Vessels, & elbows due to 3. Corrosion & Erosion 4. Impact & weld failure
		Uncontrolled vehicle movement.
		Unsafe operation / maintenance including wrong operation of valve

Events which can lead to Major accidents are:

1. Scenario 1 TFE loss of containment from silica gel dryer
2. Scenario 2 High pressure (beyond 7.5 kg/cm^2) in MST leading to loss of containment of TFE
3. Scenario 3 Loss of containment of TFE from MMT
4. Scenario 4 D-PTFE Runaway reaction leading to loss of containment of TFE/ other toxic combustion product
5. Scenario 5 Runaway Reaction in S-PTFE reactor leading to loss of containment of TFE
6. Scenario 6 Over pressure of Silica Gel Dryer leading to loss of containment of TFE
7. Scenario 7 Leakage of TFE/R22 from column T604
8. Scene 8 Runaway reaction in FKM reactor leading to over-pressure and loss of containment
9. Scenario 9 Fire in HEPA filters of continuous dryer
10. Scenario 10 Fire in HEPA filters of continuous dryer
11. Scenario 11 Possible ignition and decomposition of PTFE generating hydrogen fluoride

12. Scenario 12 High pressure in monomer charging line leading to rupture of line and leading to TFE, PPVE, HFP loss of containment
13. Scenario 13 Loss of Containment of R142B + VDF from furnace F-301A/B or from FRP section
14. Scenario 14 Loss of containment of R142B
15. Scenario 15 Uncontrolled loss of containment of TFE from the compressor
16. Scenario 16 R125 reactor catalyst recirculation line leak
17. Scenario 17 Loss of Containment of VDF from VDF storage tank T-7601
18. Scenario 18 HF loss of containment from HF storage
19. Scenario 19 loss of containment from HCFC-22 reactor/Column system
20. Scenario 20 loss of containment from Oleum storage
21. Scenario 21 loss of containment from PVDF R-201 reactor
22. Scenario 22 loss of containment from CMS R-2201 thermal reactor
23. Scenario 23 Chlorine Bullet - loss of containment
24. Scenario 24 loss of containment of pressure energy from Boiler
25. Scenario 25 Loss of Containment in Fluoro Intermediate Reactor R2301A/ B

5.3 HAZARDS

Sr. No.	Type of Probable Emergency	Hazardous Chemicals	Type of Storage
1.	Fire & Explosion	2-Propanol	Storage Tank
		Tetra Fluoro Ethylene	Storage Tank
		Chloro Tri Fluoro Ethylene	Cylinders
		Ethane amine	Drum
		Perfluoropropylene Vinyl Ether	Cylinders
		Methanol	Storage Tank
		Hydrogen	Cylinder rack
		Mono chlorobenzene	Storage Tank
2.	Toxic / Corrosive Leakage	Carbon tetra chloride	Storage Tank
		Ammonia	Cylinder
		Chlorine	Storage tank
		Sulphuric acid	Storage Tank
		Hydrofluosilicic Acid	Storage Tank

5.4 SAFETY RELEVANT COMPONENTS

26. Total enclosed process system. DCS operated plant.
27. Instrument & Plant Air System for control all parameters.
28. High level, low level, High pressure, low pressure, high temp, high flow, low flow indication and cut off interlocking provided on storage as well as process reactors.
29. Safety Valve & rupture disk provided on rectors.
30. Battery back up arrangement with DG power set is provided for process safety.
31. Vacuum fail alarm & alternative will be provided by Nitrogen cylinder bank in case of Air compressor stop due to power failure and ejector vacuum system fail.
32. Plant is fully control from DCS from control room all parameters are controlled from the control room. Alarm and alerts will be provided.
33. Scrubbers provided in KILN process.

34. PRV will be provided on KILN and negative pressure applied in KILN process.
35. HF product will be fully under negative pressure system.
36. Safety valve, rupture disk provided on reactor and pressure storage tanks.
37. Static earthing and electric earthing (Double) provided.
38. Jumpers for static earthing on pipeline flanges of flammable chemical provided.
39. Emergency handling equipments like SCBA sets, Fire extinguishers,
40. Gas mask, PPEs, Air line respirator etc. provided.
41. Full fledge ETP plant made and it takes care of liquid effluent of the plant and final discharge parameter are maintained as per GPCB norms.
42. Scrubbers provided on all process vent and air monitoring carried out and parameters maintained as per GPCB norms.
43. Fire Water reservoir for fire hydrant and sprinkler system.
44. Storage tank area is away from the process plant and Separation Distances are maintained.
45. Dyke wall provided to all above ground storage tanks, collection pit with valve provided.
46. Lightening arrestor on all chimneys and building provided.
47. Fencing and caution notes and hazard identification boards displayed.
48. Only authorized person are permitted in storage tank farm area.
49. Safety permit for hazardous material loading unloading is prepared and implemented.
50. Static earthing provision is made at all loading unloading points of flammable chemical storage tank farm area.
51. TREM CARD provided to all transporters and trained for transportation Emergency of Hazardous chemicals.
52. Above safety relevant equipment / components are always maintained in healthy and operational condition all the time and available in adequate numbers with easy accessibility in any emergency situations. Personnel are trained for the operation.
53. Fire hydrant system and water sprinkler system installed at tank farm area.
54. Caution note, safety posters, stickers and emergency preparedness plan are displayed.
55. Emergency facilities and medical emergency facilities are available at site. Occupational Health center facility generated at factory premises and paramedical staff is available round the clock.
56. Wind direction indicators are provided.
57. Safety Shower and eye wash are installed at acid/ alkali handling area.
58. Tele Communication system and mobile phone will be used in ca se of emergency situations for communication.
59. Emergency siren installed at OHC.
60. Training programs are being conducted regularly and induction training are being provided to all employees on chemical safety and process safety.

CHAPTER 6: DESCRIPTION OF SAFETY RELEVENT UNITS, AMONG OTHERS

6.1 SPECIAL DESIGN CRITERIA

Sr No	Particular of drawing numbers	Approval Number	Capacity
1	Storage of Chlorine Gas in pressure vessel	S/HO/GJ/03/915 (S30612)	316 M^3
2	Liquid Nitrogen gas in pressure vessel	S/HO/GJ/03/1165(S35006)	10.40 M^3
3	Liquid Nitrogen gas in pressure vessel	S/HO/GJ/03/944 (S31609)	19.38 M^3
			3.70 M^3
			40.39 M^3
			Total - 63.46 M^3
4	R-22 Storage (Chlorodifluoromethane), R- 125 & HFP Storage in pressure vessel	S/HO/GJ/03/953 (S 31114)	80 M3 - R 22
			80 M3 - R 22
			80 M3 - HFP
			40 M3 - R 125
			Total - 280 M^3
5	Filling and Storage of Hydrogen gas	G /HO/GJ/06/575 (G22172)	Storage: 315 Nos. Cylinder filled with compressed gas.
	Storage : 315 Nos.	G/HO/GJ/05/586 (G 22172)	
6	Storage of Methanol - Petroleum Class A	P/HQ/GJ/15/4798 (P 184279)	240 KL
7	Filling & Storage of HFP	G/HO/GJ/06/688 (G27680)	Storage : 23 Nos. Cylinders
	Storage : 23 Nos. Cylinders Hexafluoropropene (R-1216)	G/HO/GJ/05/688 (G27680)	
8	R-23 storage tank	S/HO/GJ/03/1705 (S 66174)	14.53 M^3
9	Storage of Spent Methanol - Petroleum Class A	P/HQ/GJ/15/5466 (P 369983)	20 KL
10	VDF storage (VINYLIDENE FLUORIDE(VDF) 39 MT	S/HO/GJ/03/1778(S73093)	39 M^3
11	Storage of Ammonia in cylinders	G/WB/GJ/06/205(G47478)	Storage: 50 Nos. Cylinders
12	R-142b storage 39 MT	S/HO/GJ/03/1823(S73090)	39.50 M^3
13	Filling & Storage of Chlorine gas in cylinders	G/HO/GJ/05/591 & G/HO/GJ/06/580 (G22655)	136 Nos

6.2 CONTROLS & ALARMS

Equipment operating at various parameters are provided with appropriate temperature level, concentration, pressure and flow indication alarms with proper controlling methods.

Following controls and alarms have been installed

i. Safety Interlock system

ii. Remote Control Panel

iii. Instrument Panel with monitoring and alarm modules

6.3 PRESSURE RELEASE SYSTEM

Safety valve & rupture discs are provided on equipment/Storage tanks to release pressure. Hazardous vent lines are connected with scrubbing system.

Details of Safety Valves are as followed:

Equipment	Description of technical object	Functional loc.	Size/dimension	Equipment Type
MD03PSV144A	PSV ON AIR RECEIVER TANK	D-03-BRN	1'X2'/6 KG/CM2	Safety Valve
MD03PSV541C	PSV ON CL2 STORAGE TANK C, PSV-541C	D-03-CHL-STORAGE	2"X3"/17.10 KG/CM2	Safety Valve
MD03PSV550A	PSV ON VAPORISER A	D-03-CHL-VAPORI	1.5"X2.5"/18 KG/CM	Safety Valve
MD03PSV550B	PSV ON VAPORISER B	D-03-CHL-VAPORI	1.5"X2.5"/18 KG/CM	Safety Valve
MD03PSV550C	PSV ON VAPORISER C	D-03-CHL-VAPORI	1.5"X2.5"/18 KG/CM	Safety Valve
MD03PSV550D	PSV ON VAPORISER D	D-03-CHL-VAPORI	1.5"X2.5"/18 KG/CM	Safety Valve
MD03PSV550E	PSV ON VAPORISER E	D-03-CHL-VAPORI	1.5"X2.5"/18 KG/CM	Safety Valve
MD03PSV560	PSV ON LIQUID CL2 CATCH POT (VAPORIZER)	D-03-CHL-VAPORI	1"X2"/17.10 KG/CM2	Safety Valve
MD03PSV570	PSV ON LIQUID CL2 CATCH POT (CL2 BULLET)	D-03-CHL-VAPORI	1"X2"/17.10 KG/CM2	Safety Valve
MD03PSV8108	FLAKER, PSV-8108	D-03-FLK	1.5" X 3"	Safety Valve
MD03PSV8409	PSV ON NATURAL GAS SAFTY VALVE FLAKER	D-03-FLK	0.15 KG/CM2	Safety Valve
MD03PSVCCU1	PSV ON CCU-1 (OLD)	D-03-CCU	3"X4"/6 KG/CM2	Safety Valve
MD03PSVCCU2	PSV ON CCU-2 (NEW)	D-03-CCU	3"X4"/6 KG/CM2	Safety Valve
MD03PSVLIQA	PSV ON LIQUIFIER-A	D-03-CHL-LIQ	1"X1.5"	Safety Valve
MD03PSV1060	PSV ON INSTRUMENT AIR RECIVER	D-03-PUT	1.5"X2"/7.5 KG/CM2	Safety Valve
MD03PSV1070	PSV ON N2 RECIEVER TANK D-1070	D-03-PUT	1.5"X2"/7.5 KG/CM2	Safety Valve
MD03PSV1070A	PSV ON NITROGEN RECEIVER TANK D-1070A	D-03-PUT	1.5"X3",6.6 KG/CM2	Safety Valve
MD03PSV510A	PSV ON CL2 COMP A	D-03-CHL-COMP	1.5"X3"/5.5 KG/CM2	Safety Valve
MD03PSV510B	PSV ON CL2 COMP B	D-03-CHL-COMP	1.5"X3"/5.5 KG/CM2	Safety Valve
MD03PSV510C	PSV ON CL2 COMP C	D-03-CHL-COMP	1.5"X3"/5.5 KG/CM2	Safety Valve
MD03PSV510D	PSV ON CL2 COMP D	D-03-CHL-COMP	1.5"X3"/5.5 KG/CM2	Safety Valve
MD03PSV510E	PSV ON CL2 COMP E	D-03-CHL-COMP	1.5"X3"/5.5 KG/CM2	Safety Valve
MD03PSV540A	PSV ON CL2 STORAGE TANK A, PSV-540A	D-03-CHL-STORAGE	1"X2"/17.10 KG/CM2	Safety Valve

MD03PSV540B	PSV ON CL2 STORAGE TANK B, PSV-540B	D-03-CHL-STORAGE	1"X2"/17.10 KG/CM2	Safety Valve
MD03PSV540C	PSV ON CL2 STORAGE TANK C, PSV-540C	D-03-CHL-STORAGE	2"X3"/17.10 KG/CM2	Safety Valve
MD03PSV541A	PSV ON CL2 STORAGE TANK A, PSV-541A	D-03-CHL-STORAGE	1"X2"/17.10 KG/CM2	Safety Valve
MD03PSV541B	PSV ON CL2 STORAGE TANK B, PSV-541B	D-03-CHL-STORAGE	1"X2"/17.10 KG/CM2	Safety Valve
MD03PSVAVAM1	PSV ON CONDENSATE BUFFER TANK-AVAM	D-03-PUT-VAM	1"/21 KG/CM2	Safety Valve
MD03PSVAVAM2	PSV ON ABSORBER-AVAM	D-03-PUT-VAM	1"/11 KG/CM2	Safety Valve
MD03PSVAVAM3	PSV ON RCOL TO PC-AVAM, 21KG	D-03-PUT-VAM	1"/21 KG/CM2	Safety Valve
MD03PSVLIBRVAM	PSV ON LIBR VAM	D-03-PUT-VAM	2"X3"/15 KG/CM2	Safety Valve
MDNPSV2831	SAFETY VALVE ON FROM CPP TO N-V2832	D-15-830	150,3.5KG/CM2	Safety Valve
MDNRV2101C	SAFETY VALVE ON SUCTION LINE FOR C-2101C	D-15-100	50NB/80NB,3.5KG/CM	Safety Valve
MDNRV2102	RELIEF VALVE ON N-E2103 TO N-T2404	D-15-100	3"X4" - 5.2 KG/CM2	Safety Valve
MDNRV2102C	SAFETY VALVE ON DIS. LINE FOR C-2101C	D-15-100	50NB/80NB,10.5KG/C	Safety Valve
MDNRV2106	RELIEF VALVE ON T2104 DEHYDRATOR	D-15-100	3"X4"- 4.5 KG/CM2	Safety Valve
MDNRV2108A	RELIEF VALVE ON N-V2105 TO VG4 HEADER	D-15-100	1.5"X3" - 10.5 KG/	Safety Valve
MDNRV2108B	RELIEF VALVE ON N-V2107 TO VG4 HEADER	D-15-100	1.5"X3" - 10.5 KG/	Safety Valve
MDNRV2109B	SAFETY VALVE ON N-V2106C TO VG4 HEADER	D-15-100	80/100,10.5KG/CM2	Safety Valve
MDNRV2112	SAFETY VALVE ON CWS TO N-S2103	D-15-100	40/50,5.45KG/CM2	Safety Valve
MDNRV2210	SAFETY VALVE N-T2202 TO VG4 HEADER	D-15-200	100/150,11.5KG/CM2	Safety Valve
MDNRV2212	SAFETY VALVE ON-N-V2204	D-15-200	100/150,10KG/CM2	Safety Valve
MDNRV2213	SAFETY VALVE ON N-V2206 CL2 SURGE DRUM	D-15-200	40/80	Safety Valve
MDNRV2301	SAFETY VALVE N-V2301 CRUDE CMS TANK	D-15-300	100/150,10KG/CM2	Safety Valve
MDNRV2302	SAFETY VALVE FROM N-T2301B TO N-E2301	D-15-300	80/100,11KG/CM2	Safety Valve
MDNRV2303	SAFETY VALVE N-T2302 TO VG4 HEADER	D-15-300	80/100,2KG/CM2	Safety Valve
MDNRV2304A	SAFETY VALVE ON N- V2304	D-15-300	150/200,5KG/CM2	Safety Valve
MDNRV2305	SAFETY VALVE ON N-T230-2 TO N-E-2313	D-15-300	100/150,2.5KG/CM2	Safety Valve
MDNRV2306	SAFETY VALVE ON N-T2304 TO VG HEADER	D-15-300	80/100,2KG/CM2	Safety Valve

MDNRV2307A1	SAFETY VALVE ON N-V2302A TO COMON HEADER	D-15-300	150/200,2.5KG/CM2	Safety Valve
MDNRV2307A2	SAFETY VALVE ON N-V2302B TO COMON HEADER	D-15-300	150/200,2.5KG/CM2	Safety Valve
MDNRV2307B1	SAFETY VALVE ON N-V2302A TO COMON HEADER	D-15-300	150/200,2.5KG/CM2	Safety Valve
MDNRV2307B2	SAFETY VALVE ON N-V2302B TO COMON HEADER	D-15-300	150/200,2.5KG/CM2	Safety Valve
MDNRV2308A	SAFETY VALVE ON N-V2310A TO VG4 HEADER	D-15-300	80/100,2.5KG/CM2	Safety Valve
MDNRV2308B	SAFETY VALVE ON N-V2310B TO VG4 HEADER	D-15-300	80/100,2.5KG/CM2	Safety Valve
MDNRV2311	SAFETY VALVE ON N-S2306	D-15-300	40/80,12.5KG/CM2	Safety Valve
MDNRV2312	SAFETY VALVE ON N-S2307	D-15-300	40/80	Safety Valve
MDNRV2314A	SAFETY VALVE ON N-E2314A TO VGA HEADER	D-15-300	100/150,12.5KG/CM2	Safety Valve
MDNRV2314B	SAFETY VALVE ON N-E2314B TO VGA HEADER	D-15-300	100/150,12.5KG/CM2	Safety Valve
MDNRV2832	SAFETY VALVE ON N-V2832	D-15-830	100/150,3.1KG/CM2	Safety Valve
MDNRV2841	SAFETY VALVE ON N-E2107 CWR LINE	D-15-100	20/25,10KG/CM2	Safety Valve
MDNRV2901	SAFETY VALVE ON N-V2901 INST BUFFER TANK	D-15-500	25/50,7.2KG/CM2	Safety Valve
MDNSV01	SAFETY VALVE ON OIL TANK SAP.COMPNC2821	D-15-REF	25,7KG/CM2	Safety Valve
MDNSV02	SAFETY VALVE ON R-22 RECEIVER N-C2821	D-15-REF	25,21KG/CM2	Safety Valve
MDNSV03	SAFETY VALVE ON CONDENSER FORN-C2821	D-15-REF	25,21KG/CM2	Safety Valve
MDNSV04	SAFETY VALVE COLL. TANK1REF.COMPNC2821	D-15-REF	25,21KG/CM2	Safety Valve
MDNSV05	SAFETY VALVE ON COLL.TANK2REF.COMPNC2821	D-15-REF	25,21KG/CM2	Safety Valve
MDNSV06	SAFETYVALVE ON ECONOMIZER REF.COMPNC2821	D-15-REF	25,21KG/CM2	Safety Valve
MDPSV2351A	SAFETY VALVE ON TOP OF V-2312	D-04-300	100NB/150NB,3.2KG/	Safety Valve
MDPSV2351B	SAFETY VALVE ON TOP OF V-2312	D-04-300	100NB/150NB,3.63KG	Safety Valve
MDPSV2352A	SAFETY VALVE ON T-2306-3	D-04-300	150NB/200NB,3.63KG	Safety Valve
MDPSV2352B	SAFETY VALVE ON T-2306-3	D-04-300	150NB/200NB,3.2KG/	Safety Valve
MDPSV2354A	SAFETY VALVE ON T-2306-1 TOP	D-04-300	100NB/150NB,3.2KG/	Safety Valve
MDPSV2354B	SAFETY VALVE ON T-2306-1 TOP	D-04-300	100NB/150NB,3.2KG/	Safety Valve
MDPSV2831	SAFETY VALVE ON FROM CPP TO V-2832 VENT	D-04-830	100NB/150NB,3.5KG/	Safety Valve

MDRV101	SAFETY VALVE ON OIL SEPARATOR TANK -LP	D-04-REF	40NB/25NB,13KG/CM2	Safety Valve
MDRV102	SAFETY VALVE ON OIL SEPARATOR TANK -HP	D-04-REF	40NB/25NB,13KG/CM2	Safety Valve
MDRV103	SAFETY VALVE ON OIL COLLECTION TANK -LP	D-04-REF	25NB,18KG/CM2	Safety Valve
MDRV104	SAFETY VALVE ON RECEIVER-2 ON-LP	D-04-REF	25NB,25KG/CM2	Safety Valve
MDRV105	SAFETY VALVE ON RECEIVER-2 ON-HP	D-04-REF	25NB,25KG/CM2	Safety Valve
MDRV2101	SAFETY VALVE ON E-2102 SHELL SIDE	D-04-100	40NB/80NB,7.5KG/CM	Safety Valve
MDRV2101A	SAFETY VALVE ON Methyl Comp.-A,suction	D-04-100	50NB/80NB,3.5KG/CM	Safety Valve
MDRV2101B	SAFETY VALVE ON Methyl Comp.-B,suction	D-04-100	50NB/80NB,3.5KG/CM	Safety Valve
MDRV2101C	SAFETY VALVE ON SUCTION LINE FOR C-2101C	D-15-100	50NB/80NB,3.5KG/CM	Safety Valve
MDRV2102	SAFETY VALVE ON E-2103 TUBESIDE EXIT	D-04-100	80NB/100NB,5.2KG/C	Safety Valve
MDRV2102A	SAFETY VALVE ON Methyl Comp.-A,discharge	D-04-100	50NB/80NB,10.5KG/C	Safety Valve
MDRV2102B	SAFETY VALVE ON Methyl Comp.-B,discharge	D-04-100	50NB/80NB,10.5KG/C	Safety Valve
MDRV2102C	SAFETY VALVE ON DIS. LINE FOR C-2101C	D-15-100	50NB/80NB,10.5KG/C	Safety Valve
MDRV2103	SAFETY VALVE ON TOP OF S-2101	D-04-100	40NB/80NB,2.5KG/CM	Safety Valve
MDRV2106	SAFETY VALVE ON TOP OF T-2104	D-04-100	50NB/80NB,4.5KG/CM	Safety Valve
MDRV2107	SAFETY VALVE ON TOP OF S-2104	D-04-100	25NB/50NB,11KG/CM2	Safety Valve
MDRV2108A	SAFETY VALVE ON V2105 TO VG4 HEADER	D-04-100	40NB/80NB,10.5KG/C	Safety Valve
MDRV2108B	SAFETY VALVE ON V2107 TO VG4 HEADER	D-04-100	40NB/80NB,10.5KG/C	Safety Valve
MDRV2109A	SAFETY VALVE ON TOP OF V-2106A	D-04-100	80NB/100NB,10.5KG/	Safety Valve
MDRV2109B	SAFETY VALVE ON TOP OF V-2106B	D-04-100	80NB/100NB,10.5KG/	Safety Valve
MDRV2112	SAFETY VALVE ON CW1/2 to S-2103+T-2101	D-04-100	40NB/50NB,5.45KG/C	Safety Valve
MDRV2201	SAFETY VALVE ON E2201 TO VG4 HEADER	D-04-200	100NB/150NB,11KG/C	Safety Valve
MDRV2202	SAFETY VALVE ON V2201 EMER. VESSEL	D-04-200	100NB/150NB,7KG/CM	Safety Valve
MDRV2205	SAFETY VALVE ON TOP OF S-2205	D-04-200	40NB/80NB,18KG/CM2	Safety Valve
MDRV2206	SAFETY VALVE ON TOP OF V-2202	D-04-200	100NB/150NB,10KG/C	Safety Valve
MDRV2207	SAFETY VALVE ON E-2204 SHELLSIDE	D-04-200	40NB/80NB,14.5KG/C	Safety Valve

MDRV2208	SAFETY VALVE ON TOP OF S-2206	D-04-200	40NB/80NB,18KG/CM2	Safety Valve
MDRV2209	SAFETY VALVE ON TOP OF V-2203	D-04-200	80NB/100NB,10KG/CM	Safety Valve
MDRV2210	SAFETY VALVE AT TOP OF T-2202	D-04-200	100NB/150NB,11.5KG	Safety Valve
MDRV2211	SAFETY VALVE ON E-2208 SHELLSIDE	D-04-200	40NB/50NB,18KG/CM2	Safety Valve
MDRV2212	SAFETY VALVE ON TOP OF V-2204	D-04-200	80NB/100NB,11KG/CM	Safety Valve
MDRV2213	SAFETY VALVE ON TOP OF V-2206	D-04-200	40NB/80NB,18.5KG/C	Safety Valve
MDRV2214A	SAFETY VALVE ON TOP OF V-2205A	D-04-200	25NB/50NB,10KG/CM2	Safety Valve
MDRV2214B	SAFETY VALVE ON TOP OF V-2205B	D-04-200	25NB/50NB,10KG/CM2	Safety Valve
MDRV2301	SAFETY VALVE ON TOP OF V-2301	D-04-300	100NB/150NB,10KG/C	Safety Valve
MDRV2302	SAFETY VALVE ON T2301-2 TO E2301	D-04-300	80NB/100NB,11KG/CM	Safety Valve
MDRV2303	SAFETY VALVE ON T2302 TO VG4 HEADER	D-04-300	80NB/100NB,2KG/CM2	Safety Valve
MDRV2304A	SAFETY VALVE ON TOP OF V-2304	D-04-300	150NB/200NB,2.5KG/	Safety Valve
MDRV2305	SAFETY VALVE ON E-2313(CF-3014)	D-04-300	100NB/150NB,2.5KG/	Safety Valve
MDRV2306	SAFETY VALVE ON T-2304 TO VG4 HEADER	D-04-300	80NB/100NB,2KG/CM2	Safety Valve
MDRV2307A	SAFETY VALVE ON V2302A TO COMMON HEADER	D-04-300	100NB/150NB,2.5KG/	Safety Valve
MDRV2307B	SAFETY VALVE ON V2302B TO COMMON HEADER	D-04-300	100NB/150NB,2.5KG/	Safety Valve
MDRV2308A	SAFETY VALVE ON V2310A TO VG4 HEADER	D-04-300	50NB/80NB,2.5KG/CM	Safety Valve
MDRV2308B	SAFETY VALVE ON V2310B TO VG4 HEADER	D-04-300	50NB/80NB,2.5KG/CM	Safety Valve
MDRV2309A	SAFETY VALVE ON TOP OF S-2309A	D-04-300	25NB/50NB,6KG/CM2	Safety Valve
MDRV2309B	SAFETY VALVE ON TOP OF S-2309B	D-04-300	25NB/50NB,6KG/CM2	Safety Valve
MDRV2310	SAFETY VALVE ON E-2326A/B/C TO VG4 HEAER	D-04-300	50NB/80NB,2.5KG/CM	Safety Valve
MDRV2311	SAFETY VALVE ON TOP OF S-2306	D-04-300	40NB/80NB,12.5KG/C	Safety Valve
MDRV2312	SAFETY VALVE ON TOP OF S-2307	D-04-300	50NB/80NB,8KG/CM2	Safety Valve
MDRV2313	SAFETY VALVE ON E-2325	D-04-300	50NB/80NB,2.5KG/CM	Safety Valve
MDRV2314A	SAFETY VALVE ON E2314A TOP TO VGA HEADER	D-04-300	100NB/150NB,5.4KG/	Safety Valve

MDRV2314B	SAFETY VALVE ON E2314B TOP TO VGA HEADER	D-04-300	100NB/150NB,5.4KG/	Safety Valve
MDRV2501	SAFETY VALVE ON TOP OF S-2501	D-04-500	25NB/50NB,5.3KG/CM	Safety Valve
MDRV2502A	SAFETY VALVE ON TOP OF S-2503A	D-04-500	50NB/80NB,5.5KG/CM	Safety Valve
MDRV2811	SAFETY VALVE ON TOP OF V-2821	D-04-REF	40NB/80NB,16.5KG/C	Safety Valve
MDRV2821A	SAFETY VALVE ON TOP OF V-2821(New KOD)	D-04-REF	40NB/80NB,16.5KG/C	Safety Valve
MDRV2822	SAFETY VALVE ON E2116 TO ATM	D-04-100	40NB/50NB,16.5KG/C	Safety Valve
MDRV2823	SAFETY VALVE ON E-2205-1	D-04-200	40NB/80NB,16.5KG/C	Safety Valve
MDRV2824	SAFETY VALVE ON E-2821-1	D-04-821	40NB/50NB,16.5KG/C	Safety Valve
MDRV2825	SAFETY VALVE ON TOP OF V-2822	D-04-821	50NB/80NB,2.5KG/CM	Safety Valve
MDRV2831	SAFETY VALVE ON TOP OF V-2831	D-04-830	100NB/150NB,10KG/C	Safety Valve
MDRV2832	SAFETY VALVE ON TOP OF V-2832	D-04-830	100NB/150NB,3.1KG/	Safety Valve
MDRV2833	SAFETY VALVE ON TOP OF V-2833	D-04-830	40NB/80NB,5KG/CM2	Safety Valve
MDRV2841	SAFETY VALVE ON E-2107 (CWR-8404)	D-04-100	20NB/25NB,10KG/CM2	Safety Valve
MDRV2903	SAFETY VALVE ON V-2903 N2 BUFFER TANK	D-04-600	20NB/25NB,7KG/CM2	Safety Valve
MDRVS2503B	SAFETY VALVE ON TOP OF S-2503B	D-04-500	50NB/80NB,5.5KG/CM	Safety Valve
MDSV101C	SAFETY VALVE ON OIL SAP.FOR REF. COMP-C	D-04-REF	25NB,18KG/CM2	Safety Valve
MDSV102C	SAFETY VALVE ON R-22 REC.TANK REF.COMP-C	D-04-REF	25NB,21KG/CM2	Safety Valve
MDSV103C	SAFETY RELIEF VALVE ON COND. REF. COMP-C	D-04-REF	25NB,21KG/CM2	Safety Valve
MDSV104C	SAFETY VALVE ON COLL. TANK-1 REF. COMP-C	D-04-REF	25NB,18KG/CM2	Safety Valve
MDSV105C	SAFETY VALVE ON COLL. TANK-2 REF. COMP-C	D-04-REF	25NB,18KG/CM2	Safety Valve
MDSV106C	SAFETY RELIEF VALVE ON ECO. REF. COMP-C	D-04-REF	25NB,21KG/CM2	Safety Valve
MDTRV2351	SAFETY VALVE ON E-2315	D-04-300	20NB/25NB,6.5KG/CM	Safety Valve
MDTRV2352	SAFETY VALVE ON E-2329	D-04-300	20NB/40NB,7.5KG/CM	Safety Valve
MDTRV2353	SAFETY VALVE ON E-2334	D-04-300	20NB/40NB,6.5KG/CM	Safety Valve
MDTRV2356	SAFETY VALVE ON E-2342	D-04-300	20NB/40NB,6.5KG/CM	Safety Valve

MDTRV2357	SAFETY VALVE ON E-2333	D-04-300	20NB/40NB,7.5KG/CM	Safety Valve
MDTRV2358	SAFETY VALVE ON E-2344	D-04-300	20NB/40NB,6.5KG/CM	Safety Valve
MDTRV2369	SAFETY VALVE ON TOP OF S-2313	D-04-300	20NB/40NB,6.5KG/CM	Safety Valve
MD21PSV6003A	PSV FOR R22 STORAGE TANK A	D-14-HDR-R22	2"/15KG/CM2	Safety Valve
MD21PSV6003B	PSV FOR R22 STORAGE TANK B	D-14-HDR-R22	2"/15KG/CM2	Safety Valve
MD21PSV6003C	PSV FOR R22 STORAGE TANK C	D-14-HDR-R22	2"/15KG/CM2	Safety Valve
MD21PSV6004A	PSV FOR STEAM DRUM A	D-14-HDR-STEAM2	2"/5KG/CM2	Safety Valve
MD21PSV6004B	PSV FOR STEAM DRUM B	D-14-HDR-STEAM2	2"/5KG/CM2	Safety Valve
MD21PSV6005A	PSV FOR STEAM DRUM A	D-14-HDR-STEAM2	2"/5KG/CM2	Safety Valve
MD21PSV6005B	PSV FOR STEAM DRUM B	D-14-HDR-STEAM2	2"/5KG/CM2	Safety Valve
MD21PSV6006	PSV FOR NO.1 BUFFER TANK	D-14-LPX	6"/0.27KG/CM2	Safety Valve
MD21PSV6007	PSV FOR NO.3 BUFFER TANK	D-14-LPX	3"/6KG/CM2	Safety Valve
MD21PSV6008A	PSV FOR DRYER A	D-14-LPX	1.5"/16KG/CM2	Safety Valve
MD21PSV6008B	PSV FOR DRYER B	D-14-LPX	1.5"/16KG/CM2	Safety Valve
MD21PSV6008C	PSV FOR DRYER C	D-14-LPX	1.5"/16KG/CM2	Safety Valve
MD21PSV6010	PSV FOR NO.1 RE-BOILER	D-14-HPX	4"/16KG/CM2	Safety Valve
MD21PSV6012	PSV FOR NO.2 RE-BOILER	D-14-HPX	3"/8KG/CM2	Safety Valve
MD21PSV6014	PSV FOR NO.3 RE-BOILER	D-14-HPX	4"/12.5KG/CM2	Safety Valve
MD21PSV6016	PSV FOR SILICS GEL ABSORBER	D-14-HPX	2"/6KG/CM2	Safety Valve
MD21PSV6017A	PSV FOR RESIDUE TANK A	D-14-LPX	1.5"/5KG/CM2	Safety Valve
MD21PSV6017B	PSV FOR RESIDUE TANK B	D-14-LPX	1.5"/5KG/CM2	Safety Valve
MD21PSV6020	PSV FOR SOLVENT RECYCLE TANK	D-14-LPX	1.5"/8KG/CM2	Safety Valve
MD21PSV6021	PSV FOR TERPENE DISTRIBUTION TANK(311)	D-14-LPX	1"/18KG/CM2	Safety Valve
MD21PSV6022A	PSV FOR STEAM HEATING FURNACE A	D-14-LPX	2"/11KG/CM2	Safety Valve
MD21PSV6022B	PSV FOR STEAM HEATING FURNACE B	D-14-LPX	2"/11KG/CM2	Safety Valve

MD21PSV6024	PSV FOR R22 VAPORISER	D-14-LPX	4"/3.5KG/CM2	Safety Valve
MD21PSV6025	PSV FOR R22 BUFFER TANK	D-14-HDR-R22	4"/2KG/CM2	Safety Valve
MD21PSV6026A	PSV FOR STEAM BUFFER TANK A	D-14-HDR-STEAM2	3"/5.5KG/CM2	Safety Valve
MD21PSV6026B	PSV FOR STEAM BUFFER TANK B	D-14-HDR-STEAM2	3"/5.5KG/CM2	Safety Valve
MD21PSV6031	PSV FOR NO.2 BUFFER TANK	D-14-LPX	3"/3.5KG/CM2	Safety Valve
MD21PSV6038A	PSV FOR DRYER COOLING RETURN LINE A	D-14-LPX	1.5"/5.5KG/CM2	Safety Valve
MD21PSV6038B	PSV FOR DRYER COOLING RETURN LINE B	D-14-LPX	1.5"/5.5KG/CM2	Safety Valve
MD21PSV6038C	PSV FOR DRYER COOLING RETURN LINE C	D-14-LPX	1.5"/5.5KG/CM2	Safety Valve
MD21PSV6041A	PSV FOR DE-OXIDISING TOWER A	D-14-HPX	2"/16.5KG/CM2	Safety Valve
MD21PSV6041B	PSV FOR DE-OXIDISING TOWER B	D-14-HPX	2"/16.5KG/CM2	Safety Valve
MD21PSV6051	PSV FOR NO.4 AZEOTROPE TOWER	D-14-HPX	6"/8KG/CM2	Safety Valve
MD21PSV6052	PSV FOR NO.5 R22 RECOVERY TOWER	D-14-HPX	6"/6KG/CM2	Safety Valve
MD21PSV6071	PSV FOR 15. KG STEAM LINE	D-14-LPX	4"/7.5KG/CM2	Safety Valve
MD21PSV6072	PSV FOR HEATING MEDIUM FEED LINE	D-14-LPX	3"/5.5KG/CM2	Safety Valve
MD21PSV6076	PSV FOR HEATING MEDIUM TANK	D-14-LPX	2"/7KG/CM2	Safety Valve
MD21PSV6077	PSV FOR NO. 1 ROUGH SEPARATION TOWER	D-14-HPX	6"/14.4KG/CM2	Safety Valve
MD21PSV6078	PSV FOR NO.2 LIGHT FRACTION REMOVL TOWER	D-14-HPX	6"/11KG/CM2	Safety Valve
MD21PSV6079	PSV FOR NO. 3 RECTIFICATION TOWER	D-14-HPX	6"/9KG/CM2	Safety Valve
MD21PSV6082	PSV FOR HIGH PRESSURE LINE	D-14-LPX	4"/4.5KG/CM2	Safety Valve
MD21PSV6401	PSV FOR SILICA GEL ABSORBER OF 4F	D-14-HPX	2"/13KG/CM2	Safety Valve
MD21PSV6602A	PSV FOR CRUDE HFP TANK	D-14-LPX	1"/10KG/CM2	Safety Valve
MD21PSV6602B	PSV FOR CRUDE HFP TANK	D-14-LPX	1"/10KG/CM2	Safety Valve
MD21PSV6603	PSV FOR HFP DISTILLATION TOWER	D-14-HPX	1.5"/10KG/CM2	Safety Valve
MD21PSV8001	PSV FOR HIGH PRESSURE LINE	D-14-LPX	1.5"/8.5KG/CM2	Safety Valve
MD21PSV8002	PSV FOR HIGH PRESSURE LINE	D-14-LPX	1.5"/8.5KG/CM2	Safety Valve

MD21PSV90902	PSV MAIN STEAM HEADER PRV LINE	D-14-HPX	2"/15KG/CM2	Safety Valve
MD21PSVP609A	PSV FOR TERPENE DOSING PUMP A	D-14-LPX	1.5"/30KG/CM2	Safety Valve
MD21PSVP609B	PSV FOR TERPENE DOSING PUMP B	D-14-LPX	1.5"/30KG/CM2	Safety Valve
MD21PSVP612A	PSV FOR SOLVENT RECYCLE PUMP A	D-14-LPX	1.5"/17KG/CM2	Safety Valve
MD21PSVP612B	PSV FOR SOLVENT RECYCLE PUMP B	D-14-LPX	1.5"/17KG/CM2	Safety Valve
MD31PSV6003A	PSV FOR R22 STORAGE TANK A	D-43-HDR-R22	2"*300#,16.5 KG/CM	Safety Valve
MD31PSV6003B	PSV FOR R22 STORAGE TANK B	D-43-HDR-R22	2"*300#,16.5 KG/CM	Safety Valve
MD31PSV6003C	PSV FOR R22 STORAGE TANK C	D-43-HDR-R22	2"*300#,16.5 KG/CM	Safety Valve
MD31PSV6004A	PSV 6004A FOR STEAM DRUM A	D-43-HDR-STEAM2	2"*150#,4 KG/CM2G	Safety Valve
MD31PSV6004B	PSV 6004B FOR STEAM DRUM B	D-43-HDR-STEAM2	2"*150#,4 KG/CM2G	Safety Valve
MD31PSV6005A	PSV 6005A FOR STEAM DRUM A	D-43-HDR-STEAM2	2"*150#,4 KG/CM2G	Safety Valve
MD31PSV6005B	PSV 6005B FOR STEAM DRUM B	D-43-HDR-STEAM2	2"*150#,4 KG/CM2G	Safety Valve
MD31PSV6006	PSV FOR NO.1 BUFFER TANK	D-43-LPX	4"*300#,0.3 KG/CM2	Safety Valve
MD31PSV6007	PSV FOR NO.3 BUFFER TANK	D-43-LPX	3"*300#,7.5 KG/CM2	Safety Valve
MD31PSV6008A	PSV FOR DRYER A	D-43-LPX	1.5"*300#,19 KG/CM	Safety Valve
MD31PSV6008B	PSV FOR DRYER B	D-43-LPX	1.5"*300#,19 KG/CM	Safety Valve
MD31PSV6008C	PSV FOR DRYER C	D-43-LPX	1.5"*300#,19 KG/CM	Safety Valve
MD31PSV6010	PSV FOR NO.1 RE BOILER	D-43-HPX	4"*300#,18 KG/CM2G	Safety Valve
MD31PSV6012	PSV FOR NO.2 RE BOILER	D-43-HPX	3"*300#,15.5 KG/CM	Safety Valve
MD31PSV6014	PSV FOR NO.3 RE BOILER	D-43-HPX	4"*300#,13 KG/CM2G	Safety Valve
MD31PSV6016	PSV FOR SILICS GEL ABSORBER	D-43-HPX	2"*300#,7.5 KG/CM2	Safety Valve
MD31PSV6017A	PSV FOR RESIDUE TANK A	D-43-LPX	1.5"*300#,6.5 KG/C	Safety Valve
MD31PSV6017B	PSV FOR RESIDUE TANK B	D-43-LPX	1.5"*300#,6.5 KG/C	Safety Valve
MD31PSV6020	PSV FOR SOLVENT RECYCLE TANK	D-43-LPX	1.5"*300#,10 KG/CM	Safety Valve
MD31PSV6021	PSV FOR TERPENE DISTRIBUTION TANK(311)	D-43-LPX	1"*300#,20 KG/CM2G	Safety Valve

MD31PSV6022A	PSV FOR STEAM HEATING FURNACE A	D-43-LPX	2"*150#,12 KG/CM2G	Safety Valve
MD31PSV6022B	PSV FOR STEAM HEATING FURNACE B	D-43-LPX	2"*150#,12 KG/CM2G	Safety Valve
MD31PSV6024	PSV FOR R22 VAPORISER	D-43-LPX	4"*300#,4.0 KG/CM2	Safety Valve
MD31PSV6025	PSV FOR R22 BUFFER TANK	D-43-HDR-R22	4"*300#,3.0 KG/CM2	Safety Valve
MD31PSV6026A	PSV A FOR STEAM BUFFER TANK	D-43-HDR-STEAM2	3"*150#,6 KG/CM2G	Safety Valve
MD31PSV6026B	PSV B FOR STEAM BUFFER TANK	D-43-HDR-STEAM2	3"*150#,6 KG/CM2G	Safety Valve
MD31PSV6031	PSV FOR NO.2 BUFFER TANK	D-43-LPX	3"*300#,4.2 KG/CM2	Safety Valve
MD31PSV6038A	PSV FOR DRYER COOLING RETURN LINE A	D-43-LPX	1.5"*150#,6 KG/CM2	Safety Valve
MD31PSV6038B	PSV FOR DRYER COOLING RETURN LINE B	D-43-LPX	1.5"*150#,6 KG/CM2	Safety Valve
MD31PSV6038C	PSV FOR DRYER COOLING RETURN LINE C	D-43-LPX	1.5"*150#,6 KG/CM2	Safety Valve
MD31PSV6041	PSV FOR DE OXIDISING TOWER A	D-43-HPX	3"*150#,18 KG/CM2G	Safety Valve
MD31PSV6051	PSV FOR NO.4 AZEOTROPE TOWER	D-43-HPX	6"*300#,10 KG/CM2G	Safety Valve
MD31PSV6052	PSV FOR NO.5 R22 RECOVERY TOWER	D-43-HPX	6"*300#,7.5 KG/CM2	Safety Valve
MD31PSV6071	PSV FOR 15. KG STEAM LINE	D-43-LPX	4"*150#,8 KG/CM2G	Safety Valve
MD31PSV6072	PSV FOR HEATING MEDIUM FEED LINE	D-43-LPX	4"*150#,8 KG/CM2G	Safety Valve
MD31PSV6076	PSV FOR HEATING MEDIUM TANK	D-43-LPX	2"*300#,8 KG/CM2G	Safety Valve
MD31PSV6077	PSV FOR NO. 1 ROUGH SEPARATION TOWER	D-43-HPX	6"*300#,17.5 KG/CM	Safety Valve
MD31PSV6078	PSV FOR NO.2 LIGHT FRACTION REMOVL TOWER	D-43-HPX	6"*300#,15 KG/CM2G	Safety Valve
MD31PSV6079	PSV FOR NO. 3 RECTIFICATION TOWER	D-43-HPX	6"*300#,12.5 KG/CM	Safety Valve
MD31PSV6082	PSV6082 FOR HIGH PRESSURE LINE	D-43-LPX	4"*150#,6 KG/CM2G	Safety Valve
MD31PSV6083	PSV FOR STEAM 1.5KG/CM2 GND FLOOR	D-43-HPX	6"*150#,9 KG/CM2G	Safety Valve
MD31PSV6095	VALVE,SAFETY,RELIEF,31 PSV 6095	D-43-HPX	3/4"*150#,5 KG/CM2	Safety Valve
MD31PSV6401	PSV FOR SILICA GEL ABSORBER OF 4F	D-43-HPX	1.5"*300#,16 KG/CM	Safety Valve
MD31PSV6601	PRESSURE SAFETY VALVE,1"X300#,PSV6601	D-43-HPX	1"*300#,10 KG/CM2G	Safety Valve
MD31PSV6602A	PSV 6602A FOR CRUDE HFP TANK A	D-43-LPX	1"*300#,12 KG/CM2G	Safety Valve

MD31PSV6602B	PSV 6602B FOR CRUDE HFP TANK B	D-43-LPX	1"*300#,12 KG/CM2G	Safety Valve
MD31PSV6603	PSV FOR HFP DISTILLATION TOWER	D-43-HPX	1.5"*300#,12 KG/CM	Safety Valve
MD31PSV6701	VALVE,SAFETY,RELIEF,31 PSV 6701	D-43-LV2	1"*300#,3 KG/CM2G	Safety Valve
MD31PSV6702A	VALVE,SAFETY,RELIEF,31 PSV 6702A	D-43-LPX	1"*300#,8 KG/CM2G	Safety Valve
MD31PSV6702B	VALVE,SAFETY,RELIEF,31 PSV 6702B	D-43-LPX	1"*300#,8 KG/CM2G	Safety Valve
MD31PSV6703	VALVE,SAFETY,RELIEF,31 PSV 6703	D-43-LV2	1"*300#,3 KG/CM2G	Safety Valve
MD31PSV8001	PSV 8001 FOR HIGH PRESSURE LINE	D-43-LPX	1.5"/8.5KG/CM2	Safety Valve
MD31PSV8002	PSV 8002 FOR HIGH PRESSURE LINE	D-43-LPX	1.5"/8.5KG/CM2	Safety Valve
MD31PSV8003	PSV 8003 FOR HIGH PRESSURE LINE	D-43-LPX	2"*150#,6 KG/CM2G	Safety Valve
MD31PSV90902	PSV MAIN STEAM HEADER PRV LINE	D-43-HPX	2"/15KG/CM2	Safety Valve
MD31PSVP609A	PSV FOR TERPENE DOSING PUMP A	D-43-LPX	1.5"/30 KG/CM2G	Safety Valve
MD31PSVP609B	PSV FOR TERPENE DOSING PUMP B	D-43-LPX	1.5"/30 KG/CM2G	Safety Valve
MD31PSVP612A	PSV FOR SOLVENT RECYCLE PUMP A	D-43-LPX	1.5"/17KG/CM2	Safety Valve
MD31PSVP612B	PSV FOR SOLVENT RECYCLE PUMP B	D-43-LPX	1.5"/17KG/CM2	Safety Valve
MDPSV6003A	PSV FOR R22 STORAGE TANK A, MOC:CS	D-05-LPX	2"/15KG/CM2	Safety Valve
MDPSV6003B	PSV FOR R22 STORAGE TANK B, MOC:CS	D-05-LPX	2"/15KG/CM2	Safety Valve
MDPSV6003C	PSV FOR R22 STORAGE TANK C, MOC:CS	D-05-LPX	2"/15KG/CM2	Safety Valve
MDPSV6004A	PSV FOR STEAM DRUM A	D-05-LPX	2"/5KG/CM2	Safety Valve
MDPSV6004B	PSV FOR STEAM DRUM B	D-05-LPX	2"/5KG/CM2	Safety Valve
MDPSV6005A	PSV FOR STEAM DRUM A	D-05-LPX	2"/5KG/CM2	Safety Valve
MDPSV6005B	PSV FOR STEAM DRUM B	D-05-LPX	2"/5KG/CM2	Safety Valve
MDPSV6006	PSV FOR NO.1 BUFFER TANK	D-05-LPX	6"/0.27KG/CM2	Safety Valve
MDPSV6007	PSV FOR NO3 BUFFER TANK, MOC:CS	D-05-HPX	3"/6KG/CM2	Safety Valve
MDPSV6008A	PSV FOR DRYER A	D-05-HPX	1.5"/16KG/CM2	Safety Valve
MDPSV6008B	PSV FOR DRYER B	D-05-HPX	1.5"/16KG/CM2	Safety Valve

MDPSV6008C	PSV FOR DRYER C	D-05-HPX	1.5''/16KG/CM2	Safety Valve
MDPSV6010	PSV FOR NO1 REBOILER, MOC:SS	D-05-HPX	4''/16KG/CM2	Safety Valve
MDPSV6012	PSV FOR NO2 REBOILER, MOC:CS	D-05-HPX	3''/8KG/CM2	Safety Valve
MDPSV6014	PSV FOR NO3 REBOILER, MOC:CS	D-05-HPX	4''/12.5KG/CM2	Safety Valve
MDPSV6016	PSV FOR SILICA GEL ABSORBER, MOC:CS	D-05-HPX	2''/6KG/CM2	Safety Valve
MDPSV6017A	PSV FOR RESIDUE TANK A, MOC:CS	D-05-LPX	1.5''/5KG/CM2	Safety Valve
MDPSV6017B	PSV FOR RESIDUE TANK B, MOC:CS	D-05-LPX	1.5''/5KG/CM2	Safety Valve
MDPSV6020	PSV FOR R22 COOLER, MOC:CS	D-05-LPX	1.5''/8KG/CM2	Safety Valve
MDPSV6021	PSV FOR TERPENE DISTRIBUTION TANK	D-05-LPX	1''/18KG/CM2	Safety Valve
MDPSV6022A	PSV FOR STEAM HEATING FURNACE A	D-05-LPX	2''/11KG/CM2	Safety Valve
MDPSV6022B	PSV FOR STEAM HEATING FURNACE B	D-05-LPX	2''/11KG/CM2	Safety Valve
MDPSV6024	PSV FOR R22 VAPORISER HE, MOC:CS	D-05-LPX	4''/3.5KG/CM2	Safety Valve
MDPSV6025	PSV FOR R22 BUFFER TANK, MOC:CS	D-05-LPX	4''/2KG/CM2	Safety Valve
MDPSV6026A	PSV FOR STEAM BUFFER TANK NORTH SIDE, CS	D-05-LPX	3''/5.5/KG/CM2	Safety Valve
MDPSV6026B	PSV FOR STEAM BUFFER TANK SOUTH SIDE, CS	D-05-LPX	3''/5.5/KG/CM2	Safety Valve
MDPSV6031	PSV FOR NO2 BUFFER TANK, MOC:CS	D-05-LPX	3''/3KG/CM2	Safety Valve
MDPSV6038A	PSV FOR SILICA GEL DRYER A CW SIDE,CS	D-05-HPX	1.5''/5.5KG/CM2	Safety Valve
MDPSV6038B	PSV FOR SILICA GEL DRYER B CW SIDE,CS	D-05-HPX	1.5''/5.5KG/CM2	Safety Valve
MDPSV6038C	PSV FOR SILICA GEL DRYER C CW SIDE,CS	D-05-HPX	1.5''/5.5KG/CM2	Safety Valve
MDPSV6041A	PSV FOR DEOXIDIZING TOWER A, MOC:CS	D-05-HPX	2''/16.5KG/CM2	Safety Valve
MDPSV6041B	PSV FOR DEOXIDIZING TOWER B, MOC:CS	D-05-HPX	2''/16.5KG/CM2	Safety Valve
MDPSV6051	PSV FOR NO. 4 AZEOTROPE TOWER	D-05-HPX	6''/8KG/CM2	Safety Valve
MDPSV6052	PSV FOR NO. 5 R22 RECOVERY TOWER	D-05-HPX	6''/6KG/CM2	Safety Valve
MDPSV6071	PSV FOR 1.5KG STEAM LINE, MOC:CS	D-05-LPX	4''/7.5KG/CM2	Safety Valve
MDPSV6072	PSV FOR HEATING MEDIUM FEED LINE,CS	D-05-LPX	3''/5.5KG/CM2	Safety Valve

MDPSV6076	PSV FOR HEATING MEDIUAM TANK, MOC:CS	D-05-LPX	2"/7KG/CM2	Safety Valve
MDPSV6077	PSV FOR NO. 1 ROUGH SEPARATION TOWER	D-05-HPX	6"/14.4KG/CM2	Safety Valve
MDPSV6078	PSV FOR LIGHT FACTION REMOVAL TOWER,CS	D-05-HPX	6"/11KG/CM2	Safety Valve
MDPSV6079	PSV FOR NO. 3 RECTIFICATION TOWER	D-05-HPX	6"/9KG/CM2	Safety Valve
MDPSV6082	PSV,4",PSV6082,4.5KG/CM2	D-05-HPX	4"/4.5KG/CM2	Safety Valve
MDPSV6083	STEAM PSV 1.5KG/CM2 GND FLOOR	D-05-HPX	6"/1.8KG/CM2	Safety Valve
MDPSV6401	PSV FOR SILICA GEL DRYER FILTER 4F,CS	D-05-HPX	2"/13KG/CM2	Safety Valve
MDPSV6602A	PSV FOR CRUD HFP TANK A, MOC:CS	D-05-HPX	1"/10KG/CM2	Safety Valve
MDPSV6602B	PSV FOR CRUD HFP TANK B, MOC-CS	D-05-HPX	1"/10KG/CM2	Safety Valve
MDPSV6603	PSV FOR HFP DISTILATION TOWER,CS	D-05-HPX	1.5"/10KG/CM2	Safety Valve
MDPSV8001	PSV FOR N2 PIPE LINE NEAR LAB,CS	D-05-HPX	1.5"/8.5KG/CM2	Safety Valve
MDPSV8002	PSV FOR N2 PIPE LINE NEAR TFE1 PLANT,CS	D-05-HPX	1.5"/8.5KG/CM2	Safety Valve
MDPSV90902	PSV FOR MAIN STEAM HEADER PRV LINE	D-05-HPX	2"/15KG/CM2	Safety Valve
MDPSVP609A	PSV FOR TERPENE DOSING PUMP A	D-05-LPX	1.5"/30KG/CM2	Safety Valve
MDPSVP609B	PSV FOR TERPENE DOSING PUMP B	D-05-LPX	1.5"/30KG/CM2	Safety Valve
MDPSVP612A	PSV FOR SOLVENT RECYCLE PUMP A	D-05-LPX	1.5"/17KG/CM2	Safety Valve
MDPSVP612B	PSV FOR SOLVENT RECYCLE PUMP B	D-05-LPX	1.5"/17KG/CM2	Safety Valve
MDPSV7001	PSV FOR TFE CONDENSOR A	D-06-CON	40NB,FLANGED,25KG/	Safety Valve
MDPSV7002	PSV FOR TFE CONDENSOR B	D-06-CON	40NB,FLANGED,25KG/	Safety Valve
MDPSV7013	PSV FOR DI STORAGE TANK	D-06-LPX	80NB,FLANGED,18KG/	Safety Valve
MDPSV7014A	PSV FOR DOSING PUMP P-701A	D-06-REA	25NB,FLANGED,10KG/	Safety Valve
MDPSV7014B	PSV FOR DOSING PUMP P-701B	D-06-REA	25NB,FLANGED,10KG/	Safety Valve
MDPSV7014C	PSV FOR DOSING PUMP P-701C	D-06-REA	25NB,FLANGED,10KG/	Safety Valve
MDPSV7014D	PSV FOR DOSING PUMP P-701D	D-06-REA	25NB,FLANGED,10KG/	Safety Valve
MDPSV7014E	PSV FOR DOSING PUMP P-701E	D-06-REA	25NB,FLANGED,10KG/	Safety Valve

MDPSV7014F	PSV FOR DOSING PUMP P-701F	D-06-REA	25NB,FLANGED,10KG/	Safety Valve
MDPSV7014G	PSV FOR DOSING PUMP P-701G	D-06-REA	25NB,FLANGED,10KG/	Safety Valve
MDPSV7014H	PSV FOR DOSING PUMP P-701H	D-06-REA	25NB,FLANGED,10KG/	Safety Valve
MDPSV7014I	PSV FOR TEA DOSING PUMP P-705A	D-06-CON	25NB,FLANGED,10KG/	Safety Valve
MDPSV7014J	PSV FOR TEA DOSING PUMP P-705B	D-06-CON	25NB,FLANGED,10KG/	Safety Valve
MD21PRV8502	PRV OF REF2 DX ECONOMISER FOR -15 DEG C	D-13-TF2-REFRI2	/21	Safety Valve
MD21PRV8503	PRV OF REF2 CHILLER 8502 FOR -15 DEG C	D-13-TF2-REFRI2	/15	Safety Valve
MD21PRV8504	PRV OF REF2 DX ECONOMISER FOR -35 DEG C	D-13-TF2-REFRI2	50X100/21	Safety Valve
MD21PRV8505	PRV OF REF2 CHILLER 8503 FOR -35 DEG C	D-13-TF2-REFRI2	/15	Safety Valve
MD21PRV8506	PRV OF REF2 CHILLER 8504 FOR -35 DEG C	D-13-TF2-REFRI2	/15	Safety Valve
MD21PRV8507	PRV OF REF2 RECEVIER A	D-13-TF2-REFRI2	/21	Safety Valve
MD21PRV8508	PRV OF REF2 RECEVIER B	D-13-TF2-REFRI2	/21	Safety Valve
MD21PRV8509	PRV OF REF2 CONDENSOR A	D-13-TF2-REFRI2	/21	Safety Valve
MD21PRV8510	PRV OF REF2 CONDENSOR B	D-13-TF2-REFRI2	/21	Safety Valve
MD21PRV8511	PRV OF PURGER FOR REF-2	D-13-TF2-REFRI2	/21	Safety Valve
MD21PRV8512	PRV OF REF2 OIL SEPARATOR FOR -35 DEG C	D-13-TF2-REFRI2	/21	Safety Valve
MD21PRV8513	PRV OF REF2 OIL SEPARATOR FOR -15 DEG C	D-13-TF2-REFRI2	/21	Safety Valve
MD21PRV8514	PRV OF REF2 DX ECONOMISER FOR -35 DEG C	D-13-TF2-REFRI2	50X100/21	Safety Valve
MD21PRV8515	PRV OF REF2 OIL SEPARATOR FOR -35 DEG C	D-13-TF2-REFRI2	/21	Safety Valve
MD21PRV8516	PRV OF REF2 OIL SEPARATOR FOR -15 DEG C	D-13-TF2-REFRI2	/21	Safety Valve
MD21PRV8517	PRV OF REF2 DX ECONOMISER FOR -35 DEG C	D-13-TF2	21 KG/CM2	Safety Valve
MD21PRV8518	PRV OF REF2 OIL SEPARATOR FOR -35 DEG C	D-13-TF2-REFRI2	21 KG/CM2	Safety Valve
MD21PRV8519	PRV OF REF2 RECEVIER C	D-13-TF2-REFRI2	21 KG/CM2	Safety Valve
MD21PRV8520	PRV OF REF2 CONDENSOR C	D-13-TF2	21 KG/CM2	Safety Valve
MD21PRV8521	PRV OF AIR PURGER FOR REF-2	D-13-TF2	21 KG/CM2	Safety Valve

MD31PRV8501	PRV OF CONDENSOR (-35) TFE-3-HP	D-13-TF3-REFRI3	21/1.5"	Safety Valve
MD31PRV8502	PRV OF RECEVIER (-35) TFE-3-HP	D-13-TF3-REFRI3	21/1.5"	Safety Valve
MD31PRV8503	PRV OF (-35) DX ECO.-807A TFE-3-HP	D-13-TF3-REFRI3	21/DN15	Safety Valve
MD31PRV8504	PRV OF (-35) DX ECO.-807B TFE-3-HP	D-13-TF3-REFRI3	21/DN15	Safety Valve
MD31PRV8505	PRV OF (-35) BRINE CHILLER-803B TFE-3-HP	D-13-TF3-REFRI3	21/1.5"	Safety Valve
MD31PRV8506	PRV OF (-35) BRINE CHILLER-803A TFE-3-HP	D-13-TF3-REFRI3	21/1.5"	Safety Valve
MD31PRV8518	PRV OF CONDENSOR TFE-3-LP	D-13-TF3-REFRI3	21/1.5"	Safety Valve
MD31PRV8521	PRV OF R22 (-15) RECEVIER TFE-3-LP	D-13-TF3-REFRI3	21/1.5"	Safety Valve
MD31PRV8525	PRV OF (-15) DX ECONOMISER TFE-3-LP	D-13-TF3-REFRI3	21/DN15	Safety Valve
MD31PRV8529	PRV OF (-15) BRINE CHILLER TFE-3 LP	D-13-TF3-REFRI3	21/1.5"	Safety Valve
MD31PSV401	PSV 401 OF (-15) OIL SEP. TFE-3-LP	D-13-TF3-REFRI3	21/1.5"	Safety Valve
MD31PSV402	PSV 402 OF (-15) OIL SEP. TFE-3-LP	D-13-TF3-REFRI3	21/1.5"	Safety Valve
MDPRV8501	PRV OF CHILLER 8501 FOR -5 DEG C	D-13-TF1-REFRI1	/15	Safety Valve
MDPRV8502	PRV OF DX ECONOMISER FOR -15 DEG C	D-13-TF1-REFRI1	/21	Safety Valve
MDPRV8503	PRV OF CHILLER 8502 FOR -15 DEG C	D-13-TF1-REFRI1	/15	Safety Valve
MDPRV8504	PRV OF DX ECONOMISER FOR -35 DEG C	D-13-TF1-REFRI1	/21	Safety Valve
MDPRV8505	PRV OF CHILLER 8503 FOR -35 DEG C	D-13-TF1-REFRI1	/15	Safety Valve
MDPRV8506	PRV OF CHILLER 8504 FOR -35 DEG C	D-13-TF1-REFRI1	/15	Safety Valve
MDPRV8507	PRV OF RECEVIER A FOR REF-1	D-13-TF1-REFRI1	/21	Safety Valve
MDPRV8508	PRV OF RECEVIER B FOR REF-1	D-13-TF1-REFRI1	/21	Safety Valve
MDPRV8509	PRV OF CONDENSOR A FOR REF-1	D-13-TF1-REFRI1	/21	Safety Valve
MDPRV8510	PRV OF CONDENSOR B FOR REF-1	D-13-TF1-REFRI1	/21	Safety Valve
MDPRV8511	PRV OF PURGER FOR REF-1	D-13-TF1-REFRI1	/21	Safety Valve
MDPRV8512-A	PRV OF OIL SEPARATOR FOR COMP X-803A	D-13-TF1-REFRI1	/21	Safety Valve
MDPRV8512-B	PRV OF OIL SEPARATOR FOR COMP X-803B	D-13-TF1-REFRI1	/21	Safety Valve

MDPRV8512-C	PRV OF OIL SEPARATOR FOR COMP X-803C	D-13-TF1-REFRI1	/21	Safety Valve
MDPRV8513-A	PRV OF OIL SEPARATOR FOR COMP X-802A	D-13-TF1-REFRI1	/21	Safety Valve
MDPRV8513-B	PRV OF OIL SEPARATOR FOR COMP X-802B	D-13-TF1-REFRI1	/21	Safety Valve
MDPRV8514	PRV OF CHILLER 8505 FOR -35 DEG C	D-13-TF1-REFRI1	/15	Safety Valve
MDPRV8515	PRV OF CONDENSOR C FOR REF-1	D-13-TF1-REFRI1	/21	Safety Valve
MDPRV8516	PRV OF RECEVIER C FOR REF-1	D-13-TF1-REFRI1	/21	Safety Valve
MDPRV8517	PRV OF DX ECONOMISER FOR -35 DEG C	D-13-TF1-REFRI1	/21	Safety Valve
MDPRV8518	PRV OF PURGER FOR REF-1 NEW	D-13-TF1-REFRI1	/21	Safety Valve
MDPRV8519	PRV OF OIL SEPARATOR COMP X 801 A	D-13-TF1-REFRI1	25 MM X 50 MM	Safety Valve
MDPRV8520	PRV OF OIL SEPARATOR COMP X 801 B	D-13-TF1-REFRI1	25 MM X 50 MM	Safety Valve
MDPSV681	PSV FOR PRERBUFFER TANK V-6801,MOC:CS	D-27-COX	1"/3KG/CM2	Safety Valve
MDPSV6810A	PSV FOR SILICA GEL DRYER A,MOC:CS	D-27-HPX	1"/18KG/CM2	Safety Valve
MDPSV6810B	PSV FOR SILICA GEL DRYER B,MOC:CS	D-27-HPX	1"/18KG/CM2	Safety Valve
MDPSV6810C	PSV FOR SILICA GEL DRYER C,MOC:CS	D-27-HPX	1"/18KG/CM2	Safety Valve
MDPSV6811A	PSV FOR TERPENE PUMP P-6803A,MOC:CS	D-27-HPX	1/2"/20KG/CM2	Safety Valve
MDPSV6811B	PSV FOR TERPENE PUMP P-6803B,MOC:CS	D-27-HPX	1/2"/20KG/CM2	Safety Valve
MDPSV6812A	PSV FOR TERPENE MAKEUP PUMP A,MOC:CS	D-27-HPX	1/2"/22KG/CM2	Safety Valve
MDPSV6812B	PSV FOR TERPENE MAKEUP PUMP B,MOC:CS	D-27-HPX	1/2"/22KG/CM2	Safety Valve
MDPSV6813	PSVFOR TERPENE DISTRIBUT TANK V-6814,CS	D-27-HPX	1/2"/20KG/CM2	Safety Valve
MDPSV6814	PSV FOR ROUGH MONOMER LINE,RP-6815, CS	D-27-HPX	1"/18KG/CM2	Safety Valve
MDPSV6815	PSV FOR ROUGH SEPERATON TOWER T-6804 ,CS	D-27-HPX	2"/17.5KG/CM2	Safety Valve
MDPSV6816A	PSV FOR TERPENE RECYCLE PUMP P-6805A,CS	D-27-HPX	1/2"/20KG/CM2	Safety Valve
MDPSV6816B	PSV FOR TERPENE RECYCLE PUMP P-6805B,CS	D-27-HPX	1/2"/20KG/CM2	Safety Valve
MDPSV6817	PSV FOR STEAM 1.5KG/CM2,LS1 LINE,CS	D-27-HPX	1.5"/2KG/CM2	Safety Valve
MDPSV6818	PSV FOR ,NO 1 REBOILER E-6811,CS	D-27-HPX	1.5"/18KG/CM2	Safety Valve

MDPSV6819	PSVFOR LIGHTFRACTION REMOVAL TOWER,CS	D-27-HPX	2"/15KG/CM2	Safety Valve
MDPSV6820	PSV FOR ,NO 2 REBOILER E-6814,CS	D-27-HPX	2"/15.5KG/CM2	Safety Valve
MDPSV6821	PSV FOR HEATING MEDIUM FEED LINE HOS6806	D-27-HPX	2"/5 KG/CM2	Safety Valve
MDPSV6822	PSV FOR DISTILLATION TOWER T-6806,CS	D-27-HPX	2"/12.5KG/CM2	Safety Valve
MDPSV6823	PSV FOR NO3 REBOILER E-6817 ,CS	D-27-HPX	1.5"/13KG/CM2	Safety Valve
MDPSV6824	PSV FOR AZEOTROPR TOWER T-6807 ,CS	D-27-HPX	4"/10KG/CM2	Safety Valve
MDPSV6825	PSV FOR R22 , LINE-R22 681 ,CS	D-27-HPX	1.5"/7.5KG/CM2	Safety Valve
MDPSV6826A	PSV FOR RESEDUE TANK A V-6816A ,CS	D-27-HPX	1"/12KG/CM2	Safety Valve
MDPSV6826B	PSV FOR RESEDUE TANK B V-6816B ,CS	D-27-HPX	1"/12KG/CM2	Safety Valve
MDPSV6828	PSV FOR SILICA GEL ABSORBER A-6802 ,CS	D-27-HPX	1"/7.5KG/CM2	Safety Valve
MDPSV683	PSV FOR AFTER BUFFER TANK V-6802,MOC:CS	D-27-COX	1"/8KG/CM2	Safety Valve
MDPSV6830A	PSV FOR CRUDE HFP TANK V-6821A ,CS	D-27-HFP	1"/16KG/CM2	Safety Valve
MDPSV6830B	PSV FOR CRUDE HFP TANK V-6821B ,CS	D-27-HFP	1"/16KG/CM2	Safety Valve
MDPSV6831	PSV FOR,HFP DISTILLATION TOWER T-6809 CS	D-27-HFP	1.5"/12KG/CM2	Safety Valve
MDPSV6832	PSV FOR HFP STORAGE TANK V-6822 ,CS	D-27-HFP	1"/14KG/CM2	Safety Valve
MDPSV685	PSV FOR WASTE GAS TANK V-6825,MOC:CS	D-27-COX	1"/3KG/CM2	Safety Valve
MDPSV686	PSV FOR WASTE GAS MIXING TANK V-6826, CS	D-27-COX	1"/12KG/CM2	Safety Valve
MDPSV687	PSV FOR OVERHAUL BUFFER TANK V-6808,CS	D-27-LPX	2"/6KG/CM2	Safety Valve
MDPSV688	PSV FOR MIXTURE BUFFERTANK V-6809,MOC:CS	D-27-LPX	2"/1.5KG/CM2	Safety Valve
MDPSV689	PSV FOR SEC. BUFFERTANK V-6810,MOC:CS	D-27-LPX	2"/5KG/CM2	Safety Valve
MD07PSV630	PSV ON AIR RECIEVER OF (ZR315)	D-07-COM	25NB,9.5KG/CM2	Safety Valve
MD07PSV631	PSV ON AIR RECIEVER OF (KC-1)	D-07-COM	25NB,9.5KG/CM2	Safety Valve
MD07PSV632	PSV ON AIR RECIEVER OF (KC-2)	D-07-COM	25NB,9.5KG/CM2	Safety Valve
MD07PSV633	STEAM PSV OF REACTOR-1	D-07-R03	25NB,4KG/CM2	Safety Valve
MD07PSV634	STEAM PSV OF REACTOR-2	D-07-R03	25NB,4KG/CM2	Safety Valve

MD07PSV635	STEAM PSV OF REACTOR-3	D-07-R03	25NB,4KG/CM2	Safety Valve
MD07PSV636	STEAM PSV OF REACTOR-4	D-07-R03	25NB,4KG/CM2	Safety Valve
MD07PSV637	MAIN STEAM HEADER PSV	D-07-R03	50NB,2.5KG/CM2	Safety Valve
MD22PSV799	PSV ON AIR RECIEVER OF (KC-3)	D-19-COM	25NB,10KG/CM2	Safety Valve
MDGTBSV01	GT 1 BOILER SAFETY VALVE 1	D-01-GT1	40NB, 50KG/CM2	Safety Valve
MDGTBSV02	GT 1 BOILER SAFETY VALVE 2	D-01-GT1	40NB, 50KG/CM2	Safety Valve
MDGTBSV03	GT 1 BOILER SAFETY VALVE 3	D-01-GT1	40NB, 50KG/CM2	Safety Valve
MDBLSV01	BOILER SAFETY VALVE 1 BOILER 1	D-10-BL1	150NB, 80KG/CM2	Safety Valve
MDBLSV02	BOILER SAFETY VALVE 2 BOILER 1	D-10-BL1	150NB, 80KG/CM2	Safety Valve
MDBLSV03	BOILER SAFETY VALVE 3 BOILER 1	D-10-BL1	100NB, 72KG/CM2	Safety Valve
MDBLSV04	BOILER SAFETY VALVE 4 BOILER 2	D-10-BL2	150NB, 80KG/CM2	Safety Valve
MDBLSV05	BOILER SAFETY VALVE 5 BOILER 2	D-10-BL2	150NB, 80KG/CM2	Safety Valve
MDBLSV06	BOILER SAFETY VALVE 6 BOILER 2	D-10-BL2	100NB, 72KG/CM2	Safety Valve
MDPRSSV01	SAFETY VALVE 1 OF PRS 1	D-10-BL1	100NB, 20KG/CM2	Safety Valve
MDPRSSV02	SAFETY VALVE 2 OF PRS 2	D-10-BL1	100NB, 50KG/CM2	Safety Valve
MD23SV01	H2 BOILER SAFETY VALVE 1	D-23	75NB, 43KG/CM2	Safety Valve
MD23SV02	H2 BOILER SAFETY VALVE 2	D-23	75NB, 43KG/CM2	Safety Valve
MD18GTSV01	GT4 BOILER SAFETY VALVE 1	D-18-GTG	40NB, 50KG/CM2	Safety Valve
MD18GTSV02	GT4 BOILER SAFETY VALVE 2	D-18-GTG	40NB, 50KG/CM2	Safety Valve
MD18GTSV03	GT4 BOILER SAFETY VALVE 3	D-18-GTG	40NB, 50KG/CM2	Safety Valve
MD18GTSV04	GT5 BOILER SAFETY VALVE 1	D-18-GTG	40NB, 50KG/CM2	Safety Valve
MD18GTSV05	GT5 BOILER SAFETY VALVE 2	D-18-GTG	40NB, 50KG/CM2	Safety Valve
MD18GTSV06	GT5 BOILER SAFETY VALVE 3	D-18-GTG	40NB, 50KG/CM2	Safety Valve
MD18PRSSV	SAFETY VALVE OF PRS	D-18-STG	100NB, 50KG/CM2	Safety Valve
MD11PSV301	SAFETY VALVE FOR HIGH PR PUMP P521A	D-11-POL	400 KG/CM2	Safety Valve

MD11PSV302	SAFETY VALVE FOR HIGH PR PUMP P521C	D-11-POL	400 KG/CM2	Safety Valve
MD11PSV505C	SAFETY VALVE FOR CONDENSATE TANK C	D-11-DRP	80X100 MM	Safety Valve
MD11PSV505D	SAFETY VALVE FOR CONDENSATE TANK D	D-11-DRP	80X100 MM	Safety Valve
MD11PSV508A	SAFETY VALVE FOR DOSING PUMP P501-A	D-11-MON	15 MMX25 MM	Safety Valve
MD11PSV508B	SAFETY VALVE FOR DOSING PUMP P501-B	D-11-MON	15 MMX25 MM	Safety Valve
MD11PSV509L	SAFETY VALVE FOR DOSING PUMP P 502L	D-11-POL-SYSTEMF	15X15 MM	Safety Valve
MD11PSV509M	SAFETY VALVE FOR DOSING PUMP P 502M	D-11-POL-SYSTEMF	15X15 MM	Safety Valve
MD11PSV509N	SAFETY VALVE FOR DOSING PUMP P-502N	D-11-POL-SYSTEMG	25 MM X 25 MM	Safety Valve
MD11PSV509P	SAFETY VALVE FOR DOSING PUMP P-502P	D-11-POL-SYSTEMG	25 MM X 25 MM	Safety Valve
MD11PSV554F	SAFETY VALVE FOR STABILIZOR COAGULATOR F	D-11-POL-SYSTEMF	15X25	Safety Valve
MD11PSV554G	SAFETY VALVE FOR STABILIZER COAGULATOR G	D-11-POL-SYSTEMG	20 MM X 25 MM	Safety Valve
MD11PSV90930	SAFETY VALVE FOR OLD PRS 51	D-11-DRP	50X600#,80X150#	Safety Valve
MD11PSV90930A	SAFETY VALVE FOR 4 OVEN PRS 51A	D-11-DRP	50X600#,80X150#	Safety Valve
MD48PSV501H	PSV FOR MONOMER CONDENSER E-501H	D-48-MON	P:16 BAR,1/2"*1"	Safety Valve
MD48PSV502H	PSV FOR MONOMER STORAGE TANK V-501H	D-48-MON	P:16 BAR,1/2"*1"	Safety Valve
MD48PSV505JA	PSV FOR CONDENSATE TANK V-519C	D-48-DRP	P:6 BAR, 3"X4"	Safety Valve
MD48PSV505JB	PSV FOR CONDENSATE TANK V-519C	D-48-DRP	P:6 BAR, 3"X4"	Safety Valve
MD48PSV508C	PSV FOR INHIBITOR METERING PUMP P-501C	D-48-MON	PSET: 15KG/CM2	Safety Valve
MD48PSV508D	PSV FOR INHIBITOR METERING PUMP P-501D	D-48-MON	PSET: 15KG/CM2	Safety Valve
MD48PSV509HA	PSV FOR ASSISTANT METERING PUMP P-502HA	D-48-POL-SYSTEMH	P:31KG/CM2,1"X1"	Safety Valve
MD48PSV509HB	PSV FOR ASSISTANT METERING PUMP P-502HB	D-48-POL-SYSTEMH	P:31KG/CM2,1"X1"	Safety Valve
MD48PSV509JA	PSV FOR ASSISTANT METERING PUMP P-502JA	D-48-POL-SYSTEMJ	P:31KG/CM2,1"X1"	Safety Valve
MD48PSV509JB	PSV FOR ASSISTANT METERING PUMP P-502JB	D-48-POL-SYSTEMJ	P:31KG/CM2,1"X1"	Safety Valve
MD48PSV5501H	PSV FOR JACKET WATER BUFFER TANK-H	D-48-HCS-SYSTEMH	P:5 BAR, 2"X3"	Safety Valve
MD48PSV5501J	PSV FOR JACKET WATER BUFFER TANK-J	D-48-HCS-SYSTEMJ	P:5 BAR, 2"X3"	Safety Valve

MD48PSV5502H	PSV FOR R-501H JACKET LINE	D-48-POL-SYSTEMH	P:10 BAR, 3/4"X1"	Safety Valve
MD48PSV5502J	PSV FOR R501J JACKET LINE	D-48-POL-SYSTEMJ	P:10 BAR, 3/4"X1"	Safety Valve
MD48PSV5503H	PSV FOR E-801HA CWR LINE	D-48-HCS-SYSTEMH	P:6 BAR, 3/4"X1"	Safety Valve
MD48PSV5503J	PSV FOR E-801JA CWR LINE	D-48-HCS-SYSTEMJ	P:6 BAR, 3/4"X1"	Safety Valve
MD48PSV5504C	PSV FOR V-5502C HOT DI TANK	D-48-HDI	P:6 BAR, 1/2"X1"	Safety Valve
MD48PSV5505H	PSV FOR E-801HB CHWR LINE	D-48-HCS-SYSTEMH	P:10 BAR, 3/4"X1"	Safety Valve
MD48PSV5505J	PSV FOR E-801JB CHWR LINE	D-48-HCS-SYSTEMJ	P:10 BAR, 3/4"X1"	Safety Valve
MD48PSV554H	PSV FOR STABILIZER COAGULATOR E-502H	D-48-POL-SYSTEMH	P:6 BAR, 3/4"X1"	Safety Valve
MD48PSV554J	PSV FOR STABILIZER COAGULATOR E-502J	D-48-POL-SYSTEMJ	P:6 BAR, 3/4"X1"	Safety Valve
MD48PSV556H	PSV FOR SEP. TANK H JACKET O/L LINE	D-48-SEP-SYSTEMH	P:6 BAR, 3/4"X1"	Safety Valve
MD48PSV556J	PSV FOR SEP. TANK J JACKET O/L LINE	D-48-SEP-SYSTEMJ	P:6 BAR, 3/4"X1"	Safety Valve
MD48PSV588H	PSV FOR TERGITOL TRANSFER PUMP P-505H	D-48-LSS	P:6KG/CM2,1.5"X1.5	Safety Valve
MD48PSV595HJ	PSV FOR NITROGEN LINE TO V-515H	D-48-LSS	P:3.5 BAR, 1"X2"	Safety Valve
MD48TSV587H	PSV FOR HOT WATER SYSTEM HE E-504H	D-48-AHW	P:7 BAR, 3/4"X1"	Safety Valve
MDPSV-575	SAFETY VALVE FOR DI WATER HEATER	D-11-DIS	15X25 MM	Safety Valve
MDPSV501	SAFETY VALVE FOR TFE LIQUIED MONOMER 1	D-11-MON	15X25 MM	Safety Valve
MDPSV502	SAFETY VALVE FOR TFE LIQUIED MONOMER 2	D-11-MON	15X25 MM	Safety Valve
MDPSV503A	SAFETY VALVE FOR WAX FEEDING TANK A	D-11-BCS-SYSTEMA	20X25 MM	Safety Valve
MDPSV503B	SAFETY VALVE FOR WAX FEEDING TANK B	D-11-BCS-SYSTEMB	20X25 MM	Safety Valve
MDPSV503C	SAFETY VALVE FOR WAX FEEDING TANK C	D-11-BCS-SYSTEMC	20X25 MM	Safety Valve
MDPSV503D	SAFETY VALVE FOR WAX FEEDING TANK D	D-11-BCS-SYSTEMD	20X25 MM	Safety Valve
MDPSV503E	SAFETY VALVE FOR WAX FEEDING TANK E	D-11-BCS-SYSTEME	20X25 MM	Safety Valve
MDPSV504A	SAFETY VALVE FOR WAX ACTIVATION TANK A	D-11-BCS-SYSTEMA	20X25 MM	Safety Valve
MDPSV504B	SAFETY VALVE FOR WAX ACTIVATION TANK B	D-11-BCS-SYSTEMB	20X25 MM	Safety Valve
MDPSV504C	SAFETY VALVE FOR WAX ACTIVATION TANK C	D-11-BCS-SYSTEMC	20X25 MM	Safety Valve

MDPSV504D	SAFETY VALVE FOR WAX ACTIVATION TANK D	D-11-BCS-SYSTEMD	20X25 MM	Safety Valve
MDPSV504E	SAFETY VALVE FOR WAX ACTIVATION TANK E	D-11-BCS-SYSTEME	20X25 MM	Safety Valve
MDPSV505A	SAFTEY VALVE FOR CONDENSATE TANK A	D-11-DRP	80X100 MM	Safety Valve
MDPSV505B	SAFTEY VALVE FOR CONDENSATE TANK B	D-11-DRP	80X100 MM	Safety Valve
MDPSV509A	SAFETY VALVE FOR DOSING PUMP P-502A	D-11-POL-SYSTEMA	15X15 MM	Safety Valve
MDPSV509B	SAFETY VALVE FOR DOSING PUMP P-502B	D-11-POL-SYSTEMA	15X15 MM	Safety Valve
MDPSV509C	SAFETY VALVE FOR DOSING PUMP P-502C	D-11-POL-SYSTEMB	15X15 MM	Safety Valve
MDPSV509D	SAFETY VALVE FOR DOSING PUMP P-502D	D-11-POL-SYSTEMB	15X15 MM	Safety Valve
MDPSV509E	SAFETY VALVE FOR DOSING PUMP P-502E	D-11-POL-SYSTEMC	15X15 MM	Safety Valve
MDPSV509F	SAFETY VALVE FOR DOSING PUMP P-502F	D-11-POL-SYSTEMC	15X15 MM	Safety Valve
MDPSV509G	SAFETY VALVE FOR DOSING PUMP P-502G	D-11-POL-SYSTEMD	15X15 MM	Safety Valve
MDPSV509H	SAFEYY VALVE FOR DOSING PUMP P-502H	D-11-POL-SYSTEMD	15X15 MM	Safety Valve
MDPSV509J	SAFETY VALVE FOR DOSING PUMP P-502J	D-11-POL-SYSTEME	15X15 MM	Safety Valve
MDPSV509K	SAFEYY VALVE FOR DOSING PUMP P-502K	D-11-POL-SYSTEME	15X15 MM	Safety Valve
MDPSV5151A	SAFETY VALVE FOR HOT WATER A	D-11-HWS	15X25 MM	Safety Valve
MDPSV5151B	SAFETY VALVE FOR HOT WATER B	D-11-HWS	15X25 MM	Safety Valve
MDPSV5501C	SAFETY VALVE FOR WAX BUFFER TANK C	D-11-POL-SYSTEMC	2X3	Safety Valve
MDPSV5501E	SAFETY VALVE FOR WAX BUFFER TANK E	D-11-POL-SYSTEME	2X3	Safety Valve
MDPSV5504	SAFETY VALVE FOR HOT DI WATER TANK	D-11-HWS	50X80 MM	Safety Valve
MDPSV5506	SAFETY VALVE FOR OXYGEN REMOVAL COLUMN	D-11-DIS	50X80 MM	Safety Valve
MDPSV552	SAFETY VALVE FOR DI WATER	D-11-DIS	15X25 MM	Safety Valve
MDPSV554A	SAFETY VALVE FOR STABILIZOR COAGULATOR A	D-11-POL-SYSTEMA	15X25	Safety Valve
MDPSV554B	SAFETY VALVE FOR STABILIZOR COAGULATOR B	D-11-POL-SYSTEMB	15X25	Safety Valve
MDPSV554C	SAFETY VALVE FORSTABILIZOR COAGULATORC	D-11-POL-SYSTEMC	15X25	Safety Valve
MDPSV554D	SAFETY VALVE FOR STABILIZOR COAGULATOR D	D-11-POL-SYSTEMD	15X25	Safety Valve

MDPSV554E	SAFETY VALVE FOR STABILIZOR COAGULATOR E	D-11-POL-SYSTEME	0.75X1	Safety Valve
MDPSV555A	SAFETY VALVE FOR REACTOR JACKET LINE A	D-11-POL-SYSTEMA	15X25 MM	Safety Valve
MDPSV555B	SAFETY VALVE FOR REACTOR JACKET LINE B	D-11-POL-SYSTEMB	15X25 MM	Safety Valve
MDPSV555C	SAFETY VALVE FOR REACTOR JACKET LINE C	D-11-POL-SYSTEMC	15X25 MM	Safety Valve
MDPSV555D	SAFETY VALVE FOR REACTOR JACKET LINE D	D-11-POL-SYSTEMD	15X25 MM	Safety Valve
MDPSV556A	SAFETY VALVE FOR SEPRATION JACKET O/L A	D-11-BCS-SYSTEMA	15X25 MM	Safety Valve
MDPSV556B	SAFETY VALVE FOR SEPRATION JACKET O/L B	D-11-BCS-SYSTEMB	15X25 MM	Safety Valve
MDPSV556C	SAFETY VALVE FOR SEPRATION JACKET O/L C	D-11-BCS-SYSTEMC	15X25 MM	Safety Valve
MDPSV556D	SAFETY VALVE FOR SEPRATION JACKET O/L D	D-11-BCS-SYSTEMD	15X25 MM	Safety Valve
MDPSV90930	SAFETY VALVE FOR PRS STATION	D-11-DRP	80X100 MM	Safety Valve
MDPSV90951	SAFETY VALVE FOR PRS STATION	D-11-DRP	80X100 MM	Safety Valve
MDPSV90952	SAFETY VALVE FOR PRS STATION	D-11-DRP	80X100 MM	Safety Valve
MDPSV3004-1	PSV ON PRIMARY HF COND E-3102-1	D-21-STI-RECTREC	25X300/50X150/23.5	Safety Valve
MDPSV3004-2	PSV ON PRIMARY HF COND E-3102-2	D-21-STI-RECTREC	25X300/50X150/23.5	Safety Valve
MDPSV3005-1	PSV ON SECONDARY HF COND E-3103-1	D-21-STI-RECTREC	25X300/50X150/23.5	Safety Valve
MDPSV3005-2	PSV ON SECONDARY HF COND E-3103-2	D-21-STI-RECTREC	25X300/50X150/23.5	Safety Valve
MDPSV3006	PSV ON SO2 STRIPPER COL COND E-3104	D-21-STI-STRIPER	25X300/50X150/20.0	Safety Valve
MDPSV3007	PSV ON RERUN COLUMN COND E-3105	D-21-STI-DISTILN	25X300/50X150/20.0	Safety Valve
MDPSV3008	PSV ON AHF PRODUCT COOLER E-3108	D-21-STI-DISTILN	25X300/50X150/20.0	Safety Valve
MDPSV3010	PSV ON DUMP TANK V-3106D	D-21-STI-STORHAN	40X50X150#/13.0	Safety Valve
MDPSV3011	PSV ON DUMP TANK V-3106D	D-21-STI-STORHAN	40X50X150#/13.0	Safety Valve
MDPSV3012	PSV ON DUMP TANK V-3106A	D-21-STI-STORHAN	40X50X150#/7.9	Safety Valve
MDPSV3013	PSV ON DUMP TANK V-3106A	D-21-STI-STORHAN	40X50X150#/7.9	Safety Valve
MDPSV3014	PSV ON DUMP TANK V-3106B	D-21-STI-STORHAN	40X50X150#/7.9	Safety Valve
MDPSV3015	PSV ON DUMP TANK V-3106B	D-21-STI-STORHAN	40X50X150#/7.9	Safety Valve

MDPSV4001	PSV ON AHF FEED VESSEL V-4201A	D-22-SYN-FEEDING-AHFFEED	40/50X150#/7.9	Safety Valve
MDPSV4002	PSV ON AHF FEED VESSEL V-4201A	D-22-SYN-FEEDING-AHFFEED	40/50X150#/7.9	Safety Valve
MDPSV4003	PSV ON AHF FEED VESSEL V-4201B	D-22-SYN-FEEDING-AHFFEED	40/50X150#/7.9	Safety Valve
MDPSV4004	PSV ON AHF FEED VESSEL V-4201B	D-22-SYN-FEEDING-AHFFEED	40/50X150#/7.9	Safety Valve
MDPSV4005	PSV ON HEAVIES ORG RECYCLE VESSEL V-4202	D-22-SYN-FEEDING-HEAFEED	40/50X150#/6.9	Safety Valve
MDPSV4006	PSV ON REACTOR R-4201A	D-22-SYN-REACTIO	50/80X150#/14.0	Safety Valve
MDPSV4007	PSV ON REACTOR R-4201A	D-22-SYN-REACTIO	50/80X150#/14.0	Safety Valve
MDPSV4008	PSV ON REACTOR R-4201B	D-22-SYN-REACTIO	50/80X150#/14.0	Safety Valve
MDPSV4009	PSV ON REACTOR R-4201B	D-22-SYN-REACTIO	50/80X150#/14.0	Safety Valve
MDPSV4010	PSV ON REACTOR R-4201A (STEAM LINE)	D-22-SYN-REACTIO	40X300/80X150/14.0	Safety Valve
MDPSV4011	PSV ON REACTOR R-4201B (STEAM LINE)	D-22-SYN-REACTIO	40X300/80X150/14.0	Safety Valve
MDPSV4012	PSV ON CHLORINE SURGE VESSEL V-4204	D-22-SYN-FEEDING	40X300/80X150/19.9	Safety Valve
MDPSV4013	PSV ON CATALYST STORAGE TANK V-4205 A	D-22-SYN-CATLYST	40X300/50X150/14.0	Safety Valve
MDPSV4014	PSV ON CATALYST STORAGE TANK V-4205 B	D-22-SYN-CATLYST	40X300/50X150/14.0	Safety Valve
MDPSV4015	PSV ON HCL DIST.COLUMN C-4202	D-22-REC-HCLDIST	50/80X150#/17.9	Safety Valve
MDPSV4016	PSV ON HCL DIST.COLUMN C-4202	D-22-REC-HCLDIST	50/80X150#/17.9	Safety Valve
MDPSV4017	PSV ON HCL COLUMN PARTIAL COND E-4204	D-22-REC-HCLDIST	40/80X150#/19.9	Safety Valve
MDPSV4018	PSV ON PHASE SEPERATOR CHILLER E-4207	D-22-REC-PHASESE	40/80X150#/19.9	Safety Valve
MDPSV4019	PSV ON PHASE SEPERATOR V-4206	D-22-REC-PHASESE	40/80X150#/10.5	Safety Valve
MDPSV4020	PSV ON PHASE SEPERATOR V-4206	D-22-REC-PHASESE	40/80X150#/10.5	Safety Valve
MDPSV4021	PSV ON ALUMINA ADSORBER A-4201A	D-22-HCL-ALUADSO	50/80X150#/10.5	Safety Valve

MDPSV4022	PSV ON ALUMINA ADSORBER A-4201B	D-22-HCL-ALUADSO	50/80X150#/10.5	Safety Valve
MDPSV4023	PSV ON ALUMINA ADSORBER A-4201C	D-22-HCL-ALUADSO	50/80X150#/10.5	Safety Valve
MDPSV4024	PSV ON ALUMINA ADSORBER A-4201D	D-22-HCL-ALUADSO	50/80X150#/10.5	Safety Valve
MDPSV4025	PSV ON SILICA GEL ADSORBER A-4202	D-22-HCL-ALUADSO	50/80X150#/10.5	Safety Valve
MDPSV4027	PSV ON HEAVIES RECOVERY COLUMN C-4205	D-22-REC-HEAVREC	80/100X150#/10.5	Safety Valve
MDPSV4028	PSV ON HEAVIES RECOVERY COLUMN C-4205	D-22-REC-HEAVREC	80/100X150#/10.5	Safety Valve
MDPSV4029	PSV ON HF ABSORBER C-4206B	D-22-SCR-HFABSOR	80/100X150#/2.9	Safety Valve
MDPSV4030	PSV ON ACIDITY REMOVAL SCRUBBER C-4207B	D-22-SCR	80/100X150#/2.9	Safety Valve
MDPSV4031	PSV ON ACIDITY REMOVAL SCRUBBER C-4207B	D-22-SCR	80/100X150#/2.9	Safety Valve
MDPSV4032	PSV ON WEAL TSP/CAUSTIC SCRUBBER C-4208	D-22-SCR-CAUSSCR	80/100X150#/2.9	Safety Valve
MDPSV4036	PSV ON CARRY OVER GUARD TOWER A-4203	D-22-SCR	80/100X150#/2.9	Safety Valve
MDPSV4037	PSV ON DRYER FOR CRUDE RERIGERANT-A4204A	D-22-COM-CGDRYNG	40/80X150#/10.5	Safety Valve
MDPSV4038	PSV ON DRYER FOR CRUDE RERIGERANT-A4204B	D-22-COM-CGDRYNG	40/80X150#/10.5	Safety Valve
MDPSV4039	PSV ON CRUDE REFRIGERANT CONDENSR E-4220	D-22-COM-CGCOMPR	40/80X150#/19.9	Safety Valve
MDPSV4040	PSV ON CRUDE REF. V-L SEPERATOR	D-22-LIQ	40/50X150#/18.9	Safety Valve
MDPSV4041	PSV ON CRUDE REF.LIQ HOLD VESSEL V-4211	D-22-LIQ	40/50X150#/23.9	Safety Valve
MDPSV4042	PSV ON CRUDE REF.LIQ HOLD VESSEL V-4211	D-22-LIQ	40/50X150#/23.9	Safety Valve
MDPSV4043	PSV ON NON CONDENSABLE COLUMN C-4212	D-22-DIS-NCGCOLM	40/50X150#/34.9	Safety Valve
MDPSV4045	PSV ON R-22 PURIFICCATION COLUMN C-4213	D-22-DIS-R22PURI	40/50X150#/23.9	Safety Valve
MDPSV4047	PSV ON R-22 PURI COL. REFLUX DRUM V-4214	D-22-DIS-R22PURI	40/50X150#/23.9	Safety Valve
MDPSV4048	PSV ON R-22 PRODUCT STORG VESSEL V-4215A	D-22-DIS-R22STOR	40/50X150#/23.9	Safety Valve
MDPSV4049	PSV ON R-22 PRODUCT STORG VESSEL V-4215A	D-22-DIS-R22STOR	40/50X150#/23.9	Safety Valve
MDPSV4050	PSV ON R-22 DRYER A-4205A	D-22-DIS-R22PURI	40/50X150#/23.9	Safety Valve
MDPSV4051	PSV ON R-22 DRYER A-4205B	D-22-DIS-R22PURI	40/50X150#/23.9	Safety Valve
MDPSV4052	PSV ON R-22 PRODUCT STORG VESSEL V-4215B	D-22-DIS-R22STOR	40/50X150#/23.9	Safety Valve
MDPSV4053	PSV ON R-22 PRODUCT STORG VESSEL V-4215B	D-22-DIS-R22STOR	40/50X150#/23.9	Safety Valve

MDPSV4054	PSV ON R-22 DRYER A-4205C	D-22-DIS-R22PURI	40/50X150#/23.9	Safety Valve
MDPSV4055	PSV ON R-22 DRYER A-4205D	D-22-DIS-R22PURI	40/50X150#/23.9	Safety Valve
MDPSV4056	PSV ON R-22 PRODUCT STORG VESSEL V-4215C	D-22-DIS-R22STOR	40/50X150#/23.9	Safety Valve
MDPSV4057	PSV ON R-22 PRODUCT STORG VESSEL V-4215C	D-22-DIS-R22STOR	40/50X150#/23.9	Safety Valve
MDPSV4058	PSV ON R-22 DRYER A-4205E	D-22-DIS-R22PURI	40/50X150#/23.9	Safety Valve
MDPSV4059	PSV ON R-22 DRYER A-4205F	D-22-DIS-R22PURI	40/50X150#/23.9	Safety Valve
MDPSV4060	PSV ON LIGHT END RECEIVER V-4220	D-22-TOS-REACTIO	25X300/50X150/31.5	Safety Valve
MDPSV4063	PSV ON COLUMN REFLUX DRUM C-4214	D-22-DIS-R22STOR	25X300/50X150/17.8	Safety Valve
MDPSV4065	PSV ON CHLOROFORM FEED VESSEL V-4203	D-22-SYN-FEEDING-CFMFEED	40/80X150#/6.9	Safety Valve
MD20PSV595	PESSURE SAFETY VALVE FOR NITROGEN	D-20	OPER PR : 2.5 BAR	Safety Valve
MD20TSV587	TEMPERATURE SAFETY VALVE FOR HEATER	D-20-HWS	OPER PR :5.2KG/CM2	Safety Valve
MDPSV7102A	PSV FOR 15KL MMT A	D-24-MMA	25NB X 50NB	Safety Valve
MDPSV7102B	PSV FOR 15KL MMT B	D-24-MMA	25NB X 50NB	Safety Valve
MDPSV7103A	PSV FOR 40KL MMT A	D-24-MMA	25NB X 50NB	Safety Valve
MDPSV7103B	PSV FOR 40KL MMT B	D-24-MMA	25NB X 50NB	Safety Valve
MDPSV7104A	PSV FOR MMT TANK A 40KL	D-24-MMA	1"X2"	Safety Valve
MDPSV7105	PSV FOR WATER LIQUID SEPARATOR-A	D-24-MMA	25NB X 50NB	Safety Valve
MDPSV7105B	PSV FOR WATER LIQUID SEPARATOR-B	D-24-MMA	1"X2"	Safety Valve
MDPSV7106	PSV FOR INTERMEDIATE EXPANSION TANK-A	D-24-LAC	25NB X 50NB	Safety Valve
MDPSV7106B	PSV FOR INTERMEDIATE EXPANSION TANK-B	D-24-MMA	1"X2"	Safety Valve
MDPSV7207A	PSV FOR EXP. TANK A	D-24-HCV	25NB X 50NB	Safety Valve
MDPSV7207B	PSV FOR EXP. TANK B	D-24-HCV	25NB X 50NB	Safety Valve
MDTSV8100	TEMP. SAFETY VALVE FOR WATER HEATER	D-24-LAC	20NB X 50NB	Safety Valve
MD28SV0101A	SAFETY VALVE FOR 1ST STG OF COMP C-0101A	D-28-CO2	50NB/0.7 MPA	Safety Valve
MD28SV0101B	SAFETY VALVE FOR 1ST STG OF COMP C-0101B	D-28-CO2	50NB/0.7 MPA	Safety Valve

MD28SV0102A	SAFETY VALVE FOR 2ND STG OF COMP C-0101A	D-28-CO2	40NB/1.3 MPA	Safety Valve
MD28SV0102B	SAFETY VALVE FOR 2ND STG OF COMP C-0101B	D-28-CO2	40NB/1.3 MPA	Safety Valve
MD28SV0103	SAFETY VALVE FOR REFLUX TANK	D-28-CO2	40 NB/3.3 MPA	Safety Valve
MD28SV0103A	SAFETY VALVE FOR 3RD STG OF COMP C-0101A	D-28-CO2	32NB/3.1 MPA	Safety Valve
MD28SV0103B	SAFETY VALVE FOR 3RD STG OF COMP C-0101B	D-28-CO2	32NB/3.1 MPA	Safety Valve
MD28SV0105	SAFETY VALVE FOR DISTILLATION TOWER	D-28-CO2	32 NB/3.3 MPA	Safety Valve
MD28SV0201	SAFETY VALVE FOR SYPHON TANK	D-28-REF	20NB/1.85 MPA	Safety Valve
MD28SV0202	SAFETY VALVE FOR AMMONIA STORAGE TANK	D-28-REF	32NB/1.85 MPA	Safety Valve
MD28SV0207A	SAFETY VALVE FOR NH3 COMP C-0201A	D-28-REF	25NB/1.85 MPA	Safety Valve
MD28SV0207B	SAFETY VALVE FOR NH3 COMP C-0201B	D-28-REF	25NB/1.85 MPA	Safety Valve
MD28SV0208	SAFETY VALVE FOR EVAPORATIVE CONDENSER	D-28-REF	20NB/1.85 MPA	Safety Valve
MD28SV0209	SAFETY VALVE FOR LIQUID AMMONIA SEPRATOR	D-28-REF	20NB/1.85 MPA	Safety Valve
MD28SV0301	SAFETY VALVE FOR BULLET TANK-VENT LINE	D-28-STR	2.2 MPA	Safety Valve
MD28SV0302	SAFTY VLV FOR BULLET TANK TO DRY ICE M/C	D-28-STR	2.1 MPA	Safety Valve
MD28SV0303	SAFTY VLV FOR BULLET TANK-TANKER FILLING	D-28-STR	3.3 MPA	Safety Valve
MD26PSV0101	PSV FOR R-142B STORAGE TANK	D-41-TUA	4"/8KG/CM2	Safety Valve
MD26PSV0102	PSV FOR R-142B STORAGE TANK	D-41-TUA	4"/8KG/CM2	Safety Valve
MD26PSV0103	PSV FOR SILICA GEL DRYER	D-41-PUR	1"/9.5KG/CM2	Safety Valve
MD26PSV0104	PSV FOR SILICA GEL DRYER B	D-41-PUR	1"/9.5KG/CM2	Safety Valve
MD26PSV0105	PSV FOR MOLECULAR SIEVE DRYER	D-41-PUR	1"/9.5KG/CM2	Safety Valve
MD26PSV0105B	PSV FOR R142B SURGE TANK 26V0102	D-41-PUR	1"/8KG/CM2	Safety Valve
MD26PSV0106	PSV FOR MOLECULAR SIEVE DRYER B	D-41-PUR	1"/9.5KG/CM2	Safety Valve
MD26PSV0201A	PSV FOR F142B VAPORIZATION TANK	D-41-VAP	1"/9KG/CM2	Safety Valve
MD26PSV0201B	PSV FOR F142B VAPORIZATION TANK B	D-41-VAP	1"/9KG/CM2	Safety Valve
MD26PSV0202A	PSV FOR F142B TANK 26V0201A TO 26F0301A	D-41-VAP	1"/7KG/CM2	Safety Valve
MD26PSV0202B	PSV FOR F142B TANK 26V0201B TO 26F0302A	D-41-VAP	1"/7KG/CM2	Safety Valve

MD26PSV0203A	PSV FOR F142B TANK 26V0201A TO 26F0301B	D-41-VAP	1"/7KG/CM2	Safety Valve
MD26PSV0203B	PSV FOR F142B TANK 26V0201B TO 26F0302B	D-41-VAP	1"/7KG/CM2	Safety Valve
MD26PSV0504	PSV FOR LOW PRESSURE & LIQUID SEPARATOR	D-41-FCS	1"/13.5KG/CM2	Safety Valve
MD26PSV0601	PSV FOR COOLED R142b COLLECTING TANK A	D-41-REC	1"/13.5KG/CM2	Safety Valve
MD26PSV0602	PSV FOR COOLED R142b COLLECTING TANK B	D-41-REC	1"/13.5KG/CM2	Safety Valve
MD26PSV0603	PSV FOR CHILLED R142b COLLECTING TANK-1	D-41-REC	1"/13.5KG/CM2	Safety Valve
MD26PSV0604	PSV FOR CHILLED R142B COLLECTION TANK-2	D-41-REC	1"/13.5KG/CM2	Safety Valve
MD26PSV0605	PSV FOR CHILLED R142B COLLECTION TANK	D-41-REC	1"/13.5KG/CM2	Safety Valve
MD26PSV0701	PSV OF VDF INTERMEDIATE GAS STORAGE TANK	D-41-SCC	1"/13.5KG/CM2	Safety Valve
MD26PSV0704	PSV FOR VDF FEED TANK	D-41-SCC	1"/25KG/CM2	Safety Valve
MD26PSV0705	PSV OF HIGH PRESS VDF CHILLED WATER COND	D-41-SCC	1"/21.5KG/CM2	Safety Valve
MD26PSV0706	PSV OF HIGH PRESSURE VDF BRINE COND-1	D-41-SCC	1"/21.5KG/CM2	Safety Valve
MD26PSV0707	PSV OF HIGH PRESS VAPOR LIQUID SEPARATOR	D-41-SCC	1"/21.5KG/CM2	Safety Valve
MD26PSV0708	PSV OF HIGH PRESS VDF BRINE CONDENSER-2	D-41-SCC	1"/21.5KG/CM2	Safety Valve
MD26PSV0801	PSV FOR VDF DEGASSING TOWER CONDENSER	D-41-VRS	1"/19KG/CM2	Safety Valve
MD26PSV0802	PSV FOR VDF RECTIFYING TOWER CONDENSER	D-41-VRS	1"/19KG/CM2	Safety Valve
MD26PSV0804	PSV FOR PURE VDF DAY TANK	D-41-VRS	1"/22.5KG/CM2	Safety Valve
MD26PSV0901	PSV FOR VDF RECYCLING TOWER CONDENSER	D-41-DRS	1"/13KG/CM2	Safety Valve
MD26PSV0902	PSV FOR R142B DEGASSING TOWER CONDENSER	D-41-DRS	1"/9KG/CM2	Safety Valve
MD26PSV0903	PSV OF R142B DISTILLATION TOWER COND	D-41-DRS	1"/9KG/CM2	Safety Valve
MD26PSV0904A	PSV FOR R-142B STORAGE TANK A	D-41-DRS	1.5"/9KG/CM2	Safety Valve
MD26PSV0904B	PSV FOR R-142B STORAGE TANK B	D-41-DRS	1.5"/9KG/CM2	Safety Valve
MD26PSV7601A	PSV FOR VDF STORAGE TANK 26T07601	D-41-VST	3"/27KG/CM2	Safety Valve
MD26PSV7602A	PSV FOR VDF STORAGE TANK 26T07601	D-41-VST	3"/27KG/CM2	Safety Valve
MD26TSV0101	TSV FOR R142B STORAGE TANK 26V0101	D-41-TUA	0.75"/10KG/CM2	Safety Valve
MD26TSV0801	TSV FOR VDF TRANSFER PUMP A	D-41-VRS	0.75"/22KG/CM2	Safety Valve

MD26TSV0801A	TSV FOR VDF DEGASSING TOWER	D-41-VRS	0.75"/22KG/CM2	Safety Valve
MD26TSV0802	TSV FOR VDF TRANSFER PUMP B	D-41-VRS	0.75"/22KG/CM2	Safety Valve
MD26TSV7603A	TSV FOR VDF STORAGE TANK TO FKM PLANT	D-41-VST	0.75"/25KG/CM2	Safety Valve
MD26TSV7603B	TSV FOR VDF STORAGE TANK TO PVDF PLANT	D-41-VST	0.75"/25KG/CM2	Safety Valve
MD27PSV001A	PSV 01 OF VDF STORAGE TANK V0101 A	D-45-MON	13.50 KG/CM2	Safety Valve
MD27PSV001B	PSV 01 OF VDF STORAGE TANK V0101 B	D-45-MON	13.50 KG/CM2	Safety Valve
MD27PSV002A	PSV 02 OF VDF STORAGE TANK V0101 A	D-45-MON	13.50 KG/CM2	Safety Valve
MD27PSV002B	PSV 02 OF VDF STORAGE TANK V0101 B	D-45-MON	13.50 KG/CM2	Safety Valve
MD27PSV004	PSV OF EXPANSION TANK V0103	D-45-MON	55.00 KG/CM2	Safety Valve
MD27PSV005	PSV OF REACTOR JACKET WATER BUFFER TANK	D-45-HCA	5.00 KG/CM2	Safety Valve
MD27PSV007	MONOMER REMOVAL TANK	D-45-DGA	5.00 KG/CM2	Safety Valve
MD27PSV009	PSV OF HFP STORAGE TANK V0801	D-45-CPA	22.50 KG/CM2	Safety Valve

6.4 QUICK ACTING VALVES

Pneumatically operated remote-control valves have been installed at various locations to isolate/start process line during abnormality. As the plant is fully automatic and number of control valves and auto shut off valves are so many in the complex, the list is not attached. The record of calibration is well maintained and it is online on the system portal.

6.5 COLLECTING TANKS/DUMP TANKS

- ETP is having collection tanks for treatment of effluent.
- Dyke walls are provided around all tank farms containing corrosive/hazardous fluids for containments.
- Spare tanks are provided as required in the process.

6.6 SPRINKLER SYSTEM

WATER SPRAY SYSTEM:

The water spray system is provided in following plant areas. Each water spray systems are protecting specific items or groups of equipment. The design basis documents are not available. It was informed that most of the spray systems were designed by in house team. The relevant codes and standards were not found followed/considered while designing the system.

- The HF storage tanks (2 nos.) of A & H plant are protected with remotely operated water spray system. The system can be operated remotely from plant control room. The provision of bypass line is not made on the spray system inlet line.
- The water curtain system is provided on the Chlorine bullet area which can be operated automatically whenever the Chlorine detectors get activated. Though it is termed as water curtain system, but the spray nozzles were found provided instead of water curtain nozzles. The provision of bypass line is not made on the spray system inlet header.
- Automatically operated spray system on Methanol Tanks (3 nos.) is available. The system can be operated whenever the Quartzite bulbs (QBD) burst in fire situation. The deluge valves are located little away from the Methanol storage tank. The deluge system can also be activated by local manual activation. The provision of bypass line is also provided on the deluge system.
- The provision of automatically operated water spray system is ma de on the ETFE & sodium ethoxide storage tanks (2 nos.) of ETFE plant. The system can be operated whenever the Quartzite bulbs (QBD) burst in fire situation. The deluge valves are located very near the tank dyke. The deluge system can also be activated by local manual activation. The provision of bypass line is also provided on the deluge system.

- Two nos. of (VDF & R 225) storage tanks of VDF plants are protected with water spray system. The system can be operated whenever the Quartzite bulbs (QBD) burst in fire situation. The deluge valves are located very near the tank dyke. The deluge system can also be activated by local manual activation. The provision of bypass line is also provided on the deluge system.

WATER SPRINKLER SYSTEM:

- The new Administration building is protected with water spray system.

6.7 FIRE PROTECTION

Philosophy

- System is designed for handling worst scenario in the complex.
- Dedicated and reliable fire water supply.
- Closed fire water ring main to ensure water pressure at 7 kg/cm^2 at the furthest end.
- 100% standby pumping arrangement.
- Supporting water reservoirs (Sea) for firefighting in addition to dedicated fire water supply.
- Water Sprinkler system at dedicated locations.
- Automatic Deluge Valve system for immediate response in case of emergency.
- Adequate quantities of Hydrant, Water Monitor and Foam Monitors installed in plant at suitable location to cover hazardous locations.

Aim:

- To ensure safety of men, machines, material &environment from fire.
- To extinguish fire and rescue people in minimum time.
- To minimize company's loss from fire.
- To train the company and contractor employees in order to face & fight fire.
- Be prepared with emergency planning for any contingency.
- Following facilities are available at the plant site.

1) Fire Hydrant System

Fire water : Fire Fighting and Other source & capacity (Self & Mutual)	No of reservoirs Nil No. of hydrant points	No. of tanks - 02 Total Quantity:- 2500 KL No. of fire pumps, type & capacity	No. of hose reels & total length	Alternate power arrangement
Storage Tanks & bore well water storage tanks 2500 KL U/G & A/G	Yard & Internal / FEH = 322 Nos. Double headed Hydrant=6 Water / Foam monitors =34 Nos.	5 No. Electric Motor driven Main Pump = 273 M^3/Hr. @ 88 MWC 2 No. Diesel Driven Stand by Pump = 273 M^3/Hr. @ 88 MWC 3 Nos. Jockey pump = 28 M^3/Hr @ 88 MWC	02 Nos. at each Hydrant (Each 30 meters length)	DG Power Set

2) Fire extinguishers details: -

As per Annexure No 10 – Hose Real, Fire Extinguishers, Hydrant post, Water Monitor & Water cum foam Monitor, Fire Ball, Sand Bucket, Location of Smoke Detectors, Location of 's

Summary of the fire extinguishers with type and quantity

SR.NO.	TYPE	QUANTITY
1	ABC Powder Extinguisher (6 KG)	720
2	ABC Powder Extinguisher (2 KG)	93
3	ABC Powder Extinguisher (9 KG)	70
4	CO_2 Extinguisher (4.5 KG)	516
5	CO_2 Extinguisher (6.5 KG)	02
6	M. Foam (50 LTR.)	13

CHAPTER -7: INFORMATION ON HAZARD ASSESSMENT

7.1 IDENTIFICATION OF HAZARD

1. The list of Chemicals studied to identify Hazardous chemicals as per MSIHC Rule – 1989, Chemical Accident (EPPR) Rule and PLI Act/ rule and prepared separately.
2. Hazardous chemicals are further classified as per their potential hazardous property and physical property, which is available in On Site Emergency plan.
3. Quantitative Risk Assessment Study Report (June 2013, march 2020) and Risk Assessment Study (March 2011) report has been prepared and available.
4. Emergency situation like "Heavy spillage of liquid chemical" or "Gas release" or "fire" or "explosion" are further assessed for Gas Dispersion, using computer software. Result of Risk Assessment and Gas dispersion modeling are taken in to account for EMERGENCY RESPONSE PLAN (ERP) or On-Site Emergency plan.

1) COMMON CAUSES OF FAILURE

Failure of containment or pipeline may be caused by various reasons resulting in spillage / leakage of Flammable Liquids, fire and explosion. It may be due to manmade, unsafe act, unsafe condition or due to natural calamity.

2) IDENTIFICATION OF MAJOR HAZARDS AREA

Company is involved with various Hazards. However, the major hazards areas are identified as follows;

- Storage & Handling area of Hazardous Chemicals
- HSD drum handling
- Flammable Storage Area
- Hazardous Process Area.

Being continuous process of hazardous chemicals the various related hazards are posed due to different incidental activities at the site.

The following representative scenarios can be foreseen from the consequence of the failure.

- Leakage in Methanol, VDF etc.
- Hydrogen Gas Explosion
- Transportation Hazards
- Various Mobile Equipment causes serious events may create due to collision; strikes, collapse, etc.
- Collapse of Building/Structure
- Bursting of Vessel, Tanks, Air Receivers etc.
- Spillage/ leakage of liquid/oil substance.
- Electrical Fire
- Other Hazards

1. Machinery, Equipment's, Failure.
2. Hazards during maintenance jobs.

3. Failure of automation, instruments etc.
4. Natural Calamities.

7.2 CAUSES OF ACCIDENTS

1. Damage to storage tanks, Outlet valves.
2. Damage to pipelines carrying such hazardous fluids.
3. Failure of storage tanks
4. Damage Electric Instruments and short circuit
5. Bad Housekeeping
6. Loose contacts of electric cables
7. Not carry out proper Maintenance
8. Ignore Safety Precautions
9. Malfunctioning of Safety controls
10. Malfunctioning of indicators/ recorders

7.3 ASSESSMENT OF HAZARDS ACCORDING TO THEIR OCCURRENCE FREQUENCY

So far during the last many years of plant operation, the company does not come across any major incident causing wide spread damages, Repetition of similar accidents was avoided by incorporating modern techniques to control and mitigate such situation. Hence occurrence frequency was considered as very remote and unlikely in assessment.

7.4 ASSESSMENT OF ACCIDENT CONSEQUENCES

- Damage to environment including land, water and air pollution due to heavy leakage of hazardous chemicals
- Fatality, unconsciousness due to asphyxiate or contaminated gases.
- Fire and explosion may cause widespread damage to property and human lives.
- Storm and other natural events may cause heavy losses.

7.5 SAFETY SYSTEM

1. Fire Hydrant system
2. Adequate stock of foam solution (AFFF)
3. SBA sets and airline mask and hood
4. Full fledge fire control room with adequate staff
5. Licensed premises as per PESO and Factory act requirements.
6. All pressure vessel and plant have been inspected, tested and maintained
7. All lifting tools and tackle have been inspected, tested and maintained
8. Permit to work system with is implemented
9. Control of all parameter is done by adequate control valves pressure indication and flow indication and control valves, level indication etc...

10. Procedures and actions have been well defined and known to all operating personnel for safe shut down of plant in case of any power failure, instrumentation air failure cooling water failure etc.
11. DG set provide for any emergency.
12. Sufficient space provided for free movement. Safe heights are considered in designing plant lay out.
13. Insulation of piping as per requirements shall be provided.
14. Double earthing must be provided for all solvents equipment and Flame proof electrical fitting also.
15. Earthing & Bonding system and flange earthing jumpers should be provided.
16. All elevated structures have lightening arrestors.
17. Movable equipment guards provided.
18. Before commission all equipment and piping shall be cleaned by means of water flushing, air flushing etc. As per expert's instructions to avoid blockage and deposits which cause problem in safety and quality.
19. Standard Operation Procedures should be flow for better operation of Hazardous Chemicals, housekeeping, used of PPEs, material handling, preventive maintenances, etc...
20. Training for operation of equipment, use of PPEs, Accident Prevention, hazardous materials handling, critical equipment and operations, MSDS, workplace safety.
21. Daily plant inspection for Unsafe Action and Unsafe condition for better improvements.

7.6 KNOWN INDUSTRIAL ACCIDENT HISTORY

Particular	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022
Lost Time Accidents - Contract Labour	2	4	7		
Lost Time Accidents - Own Employee	1	3	3		

Particular	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022
Near miss details	32	54	143		

CHAPTER-8: DESCRIPTION OF INFORMATION ON ORGANISATIONAL SYSTEM USED TO CARRY ON INDUSTRIAL ACTIVITIES SAFELY

8.1 MAINTENANCE & INSPECTION SCHEDULE

1. Non-destructive testing like ultrasonic thickness measurement, x-ray, gamma-rays, hydraulic testing of the pressure vessel and pipelines are carried out at regular intervals as per the statutory regulations. Records of such test/inspection are maintained.

2. Equipment inspection, monitoring and audit as per legal requirements.

PREVENTIVE MAINTENANCE SCHEDULE OF CRITICAL EQUPMENT

Sr. No	Plant	Equipment Tag No	Equipment Description	Internal Examination Possibility
1	A-PTFE	V-515A	Latex Storage And Stabilization Tank	YES
2	A-PTFE	V-515B	Latex Storage And Stabilization Tank	YES
3	A-PTFE	V-515C	Latex Storage And Stabilization Tank	YES
4	A-PTFE	E-503A	HEAT EXCHANGER	NO
5	A-PTFE	E-503B	HEAT EXCHANGER-B	NO
6	A-PTFE	E-504A	WATER HEATER	NO
7	A-PTFE	E-503C	HEAT EXCHANGER -C	NO
8	CA	D-1060	Instrument Receiver Tank	YES
9	CA	D-1070	Nitrogen Receiver Tank	YES
10	CA	D-140	Brine Air Receiver Tank	YES
11	CA	D-530	Chlorine Liquifier Catch Pot Tank	NO
12	CA	D-560	Chlorine Bullet Catch Pot Tank	NO
13	CA	D-570	Chlorine Vaporizer Catch Pot Tank	NO
14	CPP	B1-PA-001	Plant Air Receiver (Boiler-1)	YES
15	CPP	B1-IA-001	Instrument Air Receiver (Boiler-1)	NO
16	CPP	B2-PA-002	Plant Air Receiver (Boiler-2)	YES
17	CPP	B1-IA-002	Instrument Air Receiver (Boiler-2)	YES
18	CCGT	CCGT-IA-3	Plant Air Tank-1	YES
19	CCGT	CCGT-IA- 004	Instrument Air Receiver Tank-2	NO
20	CCGT	CCGT-IA-5	Instrument Air Receiver Tank-3	NO
21	CCGT	CCGT-IA- 006	Instrument Air Receiver Tank-4	NO
22	CMS-1	V-2101A	Ch3Oh Daily Tank	YES
23	CMS-1	V-2101B	Ch3Oh Daily Tank	YES
24	CMS-1	V-2102	Hot Oil Tank	YES
25	CMS-1	V-2105	C-2101 Inlet Surge Drum	YES
26	CMS-1	V-2106A	Crude Ch3Cl Tank	YES

27	CMS-1	V-2106B	Crude Ch3Cl Tank	YES
28	CMS-1	V-2107	C-2101 Exit Surge Drum	YES
29	CMS-1	V-2201	Emergency Vessel	YES
30	CMS-1	V-2202	T-2202 Feed Tank	YES
31	CMS-1	V-2203	Cold Cms Tank	YES
32	CMS-1	V-2204	T-2202 Reflux Tank	YES
33	CMS-1	V-2205A	T-2201 Bottom Accumulator	YES
34	CMS-1	V-2205B	T-2201 Bottom Accumulator	YES
35	CMS-1	V-2206	Cl2 Surge Drum	YES
36	CMS-1	V-2301	Crude Cms Tank	YES
37	CMS-1	V-2302A	Ch2Cl2 Check Tank	YES
38	CMS-1	V-2302B	Ch2Cl2 Check Tank	YES
39	CMS-1	V-2304	Crude Chcl3 Tank	YES
40	CMS-1	V-2305A	Chcl3 Check Tank	YES
41	CMS-1	V-2305B	Chcl3 Check Tank	YES
42	CMS-1	V-2307B	Crude Cacl4 Tank	YES
43	CMS-1	V-2308A	Residue Tank	YES
44	CMS-1	V-2308B	Residue Tank	YES
45	CMS-1	V-2310A	Residue Check Tank	YES
46	CMS-1	V-2310B	Residue Check Tank	YES
47	CMS-1	V-2311A	Ccl4 Check Tank	YES
48	CMS-1	V-2311B	Ccl4 Check Tank	YES
49	CMS-1	V-2401	Hcl Feed Tank	NO
50	CMS-1	V-2801A	Chcl2 Storage Tank	YES
51	CMS-1	V-2802	Chcl3 Storage Tank	YES
52	CMS-1	V-2803	Ccl4 Storage Tank	YES
53	CMS-1	V-2821	R-22 Surge Drum	YES
54	CMS-1	V-2822	Ch2Cl2 Tank	YES
55	CMS-1	V-2831	Steam Surge Drum	NO
56	CMS-1	V-2832	Steam Surge Drum	NO
57	CMS-1	V-2833	Steam Flash Drum	NO
58	CMS-1	V-2834	Condensate Tank	YES
59	CMS-1	V-2901	Inst. Air Buffer Tank	YES
60	CMS-1	V-2902	Plant Air Buffer Tank	YES
61	CMS-1	V-2903	Nitrogen Buffer Tank	YES
62	CMS-1	V-2108	Seal Pot	YES
63	CMS-2	NV-2101C	Ch3Oh Daily Tank	YES
64	CMS-2	NV-2102	Hot Oil Tank	YES
65	CMS-2	NV-2105	C2101(Compressor) Inlet Surge Drum	YES
66	CMS-2	NV-2106C	Crude Ch3Cl Tank	YES
67	CMS-2	NV-2107	C2101(Compressor) Exit Surge Drum	YES
68	CMS-2	NV-2201	Emergency Vessel	YES
69	CMS-2	NV-2202	N-T2202 Feed Tank	YES

70	CMS-2	NV-2203	Cold CMS Tank	YES
71	CMS-2	NV-2204	N-T2202 Reflux Tank	YES
72	CMS-2	NV-2205A	N-T2201 Bottom Accumulator	YES
73	CMS-2	NV-2205B	N-T2201 Bottom Accumulator	YES
74	CMS-2	NV-2206	Cl2 Surge Drum	YES
75	CMS-2	NV-2301	Crude CMS Tank	YES
76	CMS-2	NV-2302A	Ch2Cl2 Check Tank	YES
77	CMS-2	NV-2302B	Ch2Cl2 Check Tank	YES
78	CMS-2	NV-2304	Crude Chcl3 Tank	YES
79	CMS-2	NV-2801C	Ch2Cl2 Storage Tank	YES
80	CMS-2	NV-2821	Surge Vessel For N-C2821 Package	YES
81	CMS-2	NV-2831	Steam Surge Drum	YES
82	CMS-2	NV-2832	Steam Surge Drum	YES
83	CMS-2	NV-2833	Steam Flash Drum	YES
84	CMS-2	NV-2834	Condensate Tank	YES
85	CU	D-202 OLD	PFA LEFT ADSORBER	YES
86	CU	D-203 OLD	PFA RIGHT ADSORBER	YES
87	CU	D-201 OLD	AIR RECEIVER TANK	YES
88	CU	D-301 OLD	NITROGEN BUFFER TANK	YES
89	CU	D-202 NEW	PFA LEFT ADSORBER	YES
90	CU	D-203 NEW	PFA RIGHT ADSORBER	YES
91	CU	D-201 NEW	AIR RECEIVER TANK	YES
92	CU	D-301 NEW	NITROGEN BUFFER TANK	YES
93	CU	V-918	INSTRUMENT AIR RECEIVER TANK	YES
94	CU	V-917	PLANT AIR RECEIVER TANK	YES
95	D-PTFE	A-501A	Silica gel Absorber	NO
96	D-PTFE	A-501B	Silica gel Absorber	NO
97	D-PTFE	A-501C	Silica gel Absorber	NO
98	D-PTFE	A-501D	Silica gel Absorber	NO
99	D-PTFE	A-501E	Silica gel Absorber	NO
100	D-PTFE	R-501A	Polymerization Reactor	YES
101	D-PTFE	R-501B	Polymerization Reactor	YES
102	D-PTFE	R-501C	Polymerization Reactor	YES
103	D-PTFE	R-501D	Polymerization Reactor	YES
104	D-PTFE	R-501E	Polymerization Reactor	YES
105	D-PTFE	V-501A	Monomer Storage Tank	YES
106	D-PTFE	V-501B	Monomer Storage Tank	YES
107	D-PTFE	V-502A	Monomer Metering Tank	YES
108	D-PTFE	V-502B	Monomer Metering Tank	YES
109	D-PTFE	V-502C	Monomer Metering Tank	YES
110	D-PTFE	V-502D	Monomer Metering Tank	YES

111	D-PTFE	V-502E	Monomer Metering Tank	YES
112	D-PTFE	V-515	Buffer Tank	YES
113	D-PTFE	V-516	Caustic Washing Tank	YES
114	D-PTFE	V-517	Gas Liquid Separator	YES
115	D-PTFE	V-519	Condensate Collection Tank	YES
116	D-PTFE	V-524A	Latex Tank	YES
117	D-PTFE	V-524B	Latex Tank	YES
118	D-PTFE	E-501	Condenser	NO
119	D-PTFE	E-502A	Stabilizer coagulator	NO
120	D-PTFE	E-502B	Stabilizer coagulator	NO
121	D-PTFE	E-502C	Stabilizer coagulator	NO
122	D-PTFE	E-502D	Stabilizer coagulator	NO
123	D-PTFE	E-505	DI water Cooler	NO
124	D-PTFE	E-502E	Stabilizer coagulator	NO
125	D-PTFE	E-5501	Condenser	NO
126	D-PTFE	R-501F	REACTOR	YES
127	D-PTFE	V502F	MONOMER METERING TANK	YES
128	D-PTFE	A501F	SILICAGEL ABSORBER	NO
129	D-PTFE	E502F	STABILIZER COAGULATOR	NO
130	D-PTFE	E5501A	MONOMER CONDENSER	NO
131	D-PTFE	V-501C	MONOMER STORAGE TANK	YES
132	D-PTFE	R-501G	REACTOR	YES
133	D-PTFE	V502G	MONOMER METERING TANK	YES
134	D-PTFE	A501G	SILICAGEL ABSORBER	NO
135	D-PTFE	E502G	STABILIZER COAGULATOR	NO
136	ETFEE	R-701	Polymerization Reactor	YES
137	ETFEE	C-701	Silica Gel Absorber	NO
138	ETFEE	E-701	Vent Condenser	NO
139	ETFEE	R-702	Polymerization Reactor	YES
140	ETFEE	E-702	Vent Condenser	NO
141	FKM	A-7101	Silica gel Absorber	NO
142	FKM	R-7201A	Reactor	YES
143	FKM	R-7201B	Reactor	YES
144	FKM	V-7002	HFP metering tank	YES
145	FKM	V-7102A	Monomer mixing tank	YES
146	FKM	V-7102B	Monomer mixing tank	YES
147	FKM	V-7103A	Monomer mixing tank	YES
148	FKM	V-7103B	Monomer mixing tank	YES
149	FKM	V-7105A	Water liquid separator	NO
150	FKM	V-7106A	Intermediate expansion tank	NO

151	FKM	V-7207A	Expansion tank	NO
152	FKM	V-7207B	Expansion tank	NO
153	FKM	C-7103A	Silica Dehydrating Columns-A	NO
154	FKM	C-7103B	Silica Dehydrating Columns-B	NO
155	FKM	C-7209A	Caustic Washing Tower	NO
156	FKM	E-7209A	Caustic Washing Rebuilder	NO
157	FKM	V-7210A	Gas Liquid Separator-A	YES
158	FKM	E-8100	Water Heater	NO
159	FKM	V-7104A	Monomer mixing tank	YES
160	HCFC	R-4201 A	Reactor	YES
161	HCFC	R-4201B	Reactor	YES
162	HCFC	V-4201A	AHF Feed Vessel	YES
163	HCFC	V-4201B	AHF Feed Vessel	YES
164	HCFC	V-4211	Crude Refrigerant Liquid Hold Vessel	YES
165	HCFC	V-4215A	TFE Grade R22 Storage Tank	YES
166	HCFC	V-4215B	TFE Grade R22 Storage Tank	YES
167	HCFC	V-4215C	TFE Grade R22 Storage Tank	YES
168	HCFC	V-4240	R-23 Storage Bullet	YES
169	Micro powder	MD46V104A	AIR RECEIVER (KAESER COMPRESSOR) 5 M3	NO
170	Micro powder	MD46V104B	AIR RECEIVER 5 M3	NO
171	PFA/FEP	V-7718X	TFE Monomer Metering Tank X	YES
172	PFA/FEP	V-7718Z	TFE Monomer Metering tank Z	YES
173	PFA/FEP	R-7701X	Polymerization Reactor (Horizontal)	YES
174	PFA/FEP	R-7701Y	Polymerization Reactor (Vertical)	YES
175	PFA/FEP	R-7701Z	Polymerization Reactor (Horizontal)	YES
176	PFA/FEP	V-7705X	SILICA GEL ADSOERBER	NO
177	PFA/FEP	V-7705Y	SILICA GEL ADSOERBER	NO
178	PFA/FEP	V-7705Z	SILICA GEL ADSOERBER	NO
179	PFA/FEP	V7726Z-A	RECOVER SILICA A	NO
180	PFA/FEP	V7726Z-B	RECOVER SILICA B	NO
181	PFA/FEP	V-7726Y-B	RECOVER SILICA B	NO

182	PFA/FEP	V-7726X-A	RECOVER SILICA A	NO
183	PTFE	R-701A	Reactor R 701 A	YES
184	PTFE	R-701B	Reactor R 701 B	YES
185	PTFE	R-701C	Reactor R 701 C	YES
186	PTFE	R-701D	Reactor R 701 D	YES
187	PTFE	R-701E	Reactor R 701 E	YES
188	PTFE	R-701F	Reactor R 701 F	YES
189	PTFE	R-701G	Reactor R 701 G	YES
190	PTFE	R-701H	Reactor R 701 H	YES
191	PTFE	V-701A	Monomer Storage Tank V 701 A	YES
192	PTFE	V-701B	Monomer Storage Tank V 701 B	YES
193	PTFE	V-701C	Monomer Storage Tank V 701 C	YES
194	PTFE	V-701D	Monomer Storage Tank V 701 D	YES
195	PTFE	V-702A	Monomer Measuring Tank V 702 A	YES
196	PTFE	V-702B	Monomer Measuring Tank V 702 B	YES
197	PTFE	V-702C	Monomer Measuring Tank V 702 C	YES
198	PTFE	V-702D	Monomer Measuring Tank V 702 D	YES
199	PTFE	V-702E	Monomer Measuring Tank V 702 E	YES
200	PTFE	V-702F	Monomer Measuring Tank V 702 F	YES
201	PTFE	V-702G	Monomer Measuring Tank V 702 G	YES
202	PTFE	V-702H	Monomer Measuring Tank V 702 H	YES
203	PTFE	V-705A	Silica Gel Absorber V 705 A	NO
204	PTFE	V-705B	Silica Gel Absorber V 705 B	NO
205	PTFE	V-705C	Silica Gel Absorber V 705 C	NO
206	PTFE	V-705D	Silica Gel Absorber V 705 D	NO
207	PTFE	V-705E	Silica Gel Absorber V 705 E	NO
208	PTFE	V-705F	Silica Gel Absorber V 705 F	NO
209	PTFE	V-705G	Silica Gel Absorber V 705 G	NO
210	PTFE	V-705H	Silica Gel Absorber V 705 H	NO
211	PTFE	E-7701C	TFE CONDENSOR E 7701 C	NO
212	PTFE	E-701A	TFE CONDENSOR E 701 A	NO
213	PTFE	E-701B	TFE CONDENSOR E 701 B	NO
214	PT-PTFE	MD22V753	Air Receiver Tank -KC-3 Compressor Area	YES
215	PT-PTFE	MD07V4201	Air Receiver Tank ZR 315VSD Compressor Area	YES
216	PT-PTFE	MD07V4202	Air Receiver Tank KC-1 Compressor Area	YES
217	PT-PTFE	MD07V4203	Air Receiver Tank KC-2 Compressor Area	YES
218	PT-PTFE	MD07V4205	AIR RECEIVER 1 M3	NO
219	S&A	V-701 C	Monomer storage Tank	YES
220	S&A	V-701D	Monomer storage Tank	YES

221	S&A	V-702 I	Monomer Metring Tank	YES
222	S&A	V-702J	Monomer Metring Tank	YES
223	S&A	V-702K	Monomer Metring Tank	YES
224	S&A	V-702L	Monomer Metring Tank	YES
225	S&A	V-705 I	Silica gel Absorber	NO
226	S&A	V-705J	Silica gel Absorber	NO
227	S&A	V-705K	Silica gel Absorber	NO
228	S&A	V-705L	Silica gel Absorber	NO
229	S&A	R-701 I	Reactor	YES
230	S&A	R-701J	Reactor	YES
231	S&A	R-701K	Reactor	YES
232	S&A	R-701L	Reactor	YES
233	S&A	E-706	Heat Exchanger	NO
234	S&A	E-702	Cooler	NO
235	S&A	E-754	Cooler	NO
236	S&A	E-701B	TFE Condenser	NO
237	SR-1	R-101	Reactor	YES
238	SR-1	V-107	Recovered Methanol Tank	YES
239	SR-1	E-101	Methanol Condenser	NO
240	SR-1	V-107B	DISTILLATE RECEIVER B	YES
241	TFE1	V602	R 22 Buffer Tank	YES
242	TFE1	V603	Steam Buffer Tank	YES
243	TFE1	V617	1 Liquid Tank	NO
244	TFE1	V617A	3 Liquid Tank	NO
245	TFE1	V621	Terpene Tank	NO
246	TFE1	V622	Terrene Metering Tank	YES
247	TFE1	V644	HFP Tonner Filling Tank	YES
248	TFE1	V601A	R22 Storage Tank	YES
249	TFE1	V601B	R22 Storage Tank	YES
250	TFE1	V601C	R22 Storage Tank	YES
251	TFE1	V618	No.2 Buffer Tank	YES
252	TFE1	V619	No.3 Buffer Tank	YES
253	TFE1	V623A	Residue Tank	YES
254	TFE1	V623B	Residue Tank	YES

255	TFE1	V628	HFP Storage Tank	YES
256	TFE1	V632A	Metering Tank	YES
257	TFE1	V632B	Metering Tank	YES
258	TFE1	V633	2 Liquid Tank	YES
259	TFE1	V639	Demister	YES
260	TFE1	V642	Terrene Distribution Tank	YES
261	TFE1	V671	Pre Buffer Tank	YES
262	TFE1	V672	Pre Buffer Tank	YES
263	TFE1	MDA601A	Dryer A	YES
264	TFE1	MDA601B	Dryer B	YES
265	TFE1	MDA601C	Dryer C	YES
266	TFE1	MDA602	SILICA GEL ABSORBER	NO
267	TFE1	MDA603	SILICA DRYER FOR 4F	NO
268	TFE1	MDA604	SILICA DRYER FOR 6F	NO
269	TFE1	MDE601	R22 VAPORISER	NO
270	TFE1	MDE602A	R22 HEATER A	NO
271	TFE1	MDE602B	R22 HEATER B	NO
272	TFE1	MDE604A	Deionized Water Heater A	NO
273	TFE1	MDE604B	Deionized Water Heater B	NO
274	TFE1	MDE608	1st Cooling Dehydrator	NO
275	TFE1	MDE608A	3rd Cooling Dehydrator	NO
276	TFE1	MDE609	2nd Cooling Dehydrator	NO
277	TFE1	MDE610	Secondary Cooler	NO
278	TFE1	MDE614	No.1 Condenser	NO
279	TFE1	MDE615	No.1 Re-boiler	NO
280	TFE1	MDE617	No.2 Condenser	NO
281	TFE1	MDE618	No.2 Re-boiler	NO
282	TFE1	MDE620	No.3 Condenser	NO
283	TFE1	MDE621	No.3 Re-boiler	NO
284	TFE1	MDE623	No.4 Condenser	NO
285	TFE1	MDE624	No.4 Re-boiler	NO
286	TFE1	MDE625	No.5 Condenser	NO
287	TFE1	MDE627	No.5 Re-boiler	NO
288	TFE1	MDE628	R22 Cooler	NO
289	TFE1	MDE630	No.1 Feeding Cooler	NO
290	TFE1	MDE635	Feeding Condenser	NO
291	TFE1	MDE641A	Cooler T-601A	NO

292	TFE1	MDE641B	Cooler T-601B	NO
293	TFE1	MDE642A	Cooler T-602A	NO
294	TFE1	MDE642B	Cooler T-602B	NO
295	TFE1	MDE651	Crude HFP Condenser	NO
296	TFE1	MDE652	HFP Distillation Condenser	NO
297	TFE1	MDE653	HFP Distillation Tower Bottom	NO
298	TFE1	MDE671	Pre Cooler LV2	NO
299	TFE1	MDE672	After Cooler LV2	NO
300	TFE1	MDF602A	Quencher A	NO
301	TFE1	MDF602B	Quencher B	NO
302	TFE1	E631	NO 2 DOUBLE PIPE COOLER	YES
303	TFE1	E632	NO.3 DOUBLE PIPE COOLER	YES
304	TFE1	E633	NO.4 DOUBLE PIPE COOLER	YES
305	TFE1	E634	NO.5 DOUBLE PIPE COOLER	YES
306	TFE1	E634A	MEG HEATER FOR HEATING MEDIUM TANK	YES
307	TFE1	T602A	DEHYDRATING TOWER A	YES
308	TFE1	T602B	DEHYDRATING TOWER B	YES
309	TFE1	T603A	DEOXIDIZING TOWER A	NO
310	TFE1	T603B	DEOXIDIZING TOWER B	NO
311	TFE1	T604	NO 1 ROUGH SEPARATION TOWER	YES
312	TFE1	T605	NO.2 LIGHT FRACTION REMOVAL TOWER	YES
313	TFE1	T606	NO. 3 RECTIFICATION TOWER	YES
314	TFE1	T607	NO.4 AZEOTROPE TOWER	YES
315	TFE1	T608	NO.5 R22 RECOVERY TOWER	YES
316	TFE1	V608B	STEAM DRUM B	NO
317	TFE2	21V601A	R22 Storage Tank	YES
318	TFE2	21V601B	R22 Storage Tank	YES
319	TFE2	21V601C	R22 Storage Tank	YES
320	TFE2	21V602	R 22 Buffer Tank	YES
321	TFE2	21V603	Steam Buffer Tank	YES
322	TFE2	21V617	1 Liquid Tank	NO
323	TFE2	21V617A	1 Liquid Tank	NO
324	TFE2	21V618	No.2 Buffer Tank	YES
325	TFE2	21V619	No.3 Buffer Tank	YES
326	TFE2	21V621	Terpene Tank	NO
327	TFE2	21V622	Terpene Metering Tank	YES
328	TFE2	21V623A	Terpene Metering Tank	YES
329	TFE2	21V623B	Residue Tank	YES
330	TFE2	21V628	HFP Storage Tank	YES
331	TFE2	21V633	2 Liquid Tank	YES
332	TFE2	21V639	Demister Tank	YES

333	TFE2	21V642	Terpene Distribution Tank	YES
334	TFE2	A601A	DRYER	YES
335	TFE2	A601B	DRYER	YES
336	TFE2	A601C	DRYER	YES
337	TFE2	A602	SILICA GEL ABSORBER	NO
338	TFE2	A603	SILICA GEL ABSORBER OF 4F	NO
339	TFE2	A604	SILICA GEL ABSORBER OF 6F	NO
340	TFE2	E601	R22 VAPORISER	NO
341	TFE2	E602A	R22 HEATER	NO
342	TFE2	E602B	R22 HEATER	NO
343	TFE2	E604A	DEIONIZED WATER HEATER	NO
344	TFE2	E604B	DEIONIZED WATER HEATER	NO
345	TFE2	E608	I ST COOLING DEHYDRATOR	NO
346	TFE2	E608A	I ST COOLING DEHYDRATOR	NO
347	TFE2	E609	IIND COOLING DEHYDRATOR	NO
348	TFE2	E610	SECONDARY COOLER	NO
349	TFE2	E614	NO.1 CONDENSER	NO
350	TFE2	E615	NO.1 R21-E-BOILER	NO
351	TFE2	E617	NO.2.CONDENSER	NO
352	TFE2	E618	NO 2 R21-E-BOILER	NO
353	TFE2	E620	NO.3 CONDENSOR	NO
354	TFE2	E621	NO 3 R21-E-BOILER	NO
355	TFE2	E623	NO.4CONDENSOR	NO
356	TFE2	E624	NO 4 R21-E-BOILER	NO
357	TFE2	E625	NO.5 CONDENSOR	NO
358	TFE2	E627	NO 5 R21-E-BOILER	NO
359	TFE2	E628	R22 COOLER	NO
360	TFE2	E630	NO.1 FEEDING COOLER	NO
361	TFE2	E635	FEEDING CONDENSOR	NO
362	TFE2	E641A	COOLER	NO
363	TFE2	E641B	COOLER	NO
364	TFE2	E642A	COOLER	NO
365	TFE2	E642B	COOLER	NO
366	TFE2	E651	CRUDE HFP CONDENSER	NO
367	TFE2	E652	HFP DISTILLATION CONDENSER	NO
368	TFE2	E653	HFP DISTILLATION TOWER BOTTOM	NO
369	TFE2	E671	PRE COOLER LV2	NO
370	TFE2	E672	AFTER COOLER LV2	NO
371	TFE2	F602A	QUENCHER A	NO
372	TFE2	F602B	QUENCHER B	NO
373	TFE2	T602A	DEHYDRATING TOWER	YES
374	TFE2	T602B	DEHYDRATING TOWER	YES
375	TFE2	T603A	DEOXIDIZING TOWER	NO

376	TFE2	T603B	DEOXIDIZING TOWER	NO
377	TFE2	T604	NO 1 ROUGH SEPARATION TOWER	YES
378	TFE2	T605	NO. 2 LIGHT FRACTION REMOVAL TOWER	YES
379	TFE2	T606	NO. 3 RECTIFICATION TOWER	YES
380	TFE2	T607	NO.4 AZEOTROPE TOWER	YES
381	TFE2	T608	NO.5 R22 RECOVERY TOWER	YES
382	TFE2	V608A	STEAM DRUM	NO
383	TFE2	V608B	STEAM DRUM	NO
384	TFE2	V671	PRE BUFFER TANK LV2	YES
385	TFE2	V672	AFTER BUFFER TANK LV2	YES
386	VDF	26V0101	R142b STORAGE TANK	YES
387	VDF	26T07601	VDF STORAGE TANK	YES
388	VDF	26V0201A	F142B VAPORIZATION TANK	NO
389	VDF	26V0401	CONC. HYDROCHLORIC TANK	YES
390	VDF	26V0402	DILUTED HCL CIRCULATING TANK	YES
391	VDF	26V0403	CAUSTIC CIRCULATING TANK	YES
392	VDF	26V0503	LOW PRESSURE VAPOR AND LIQUID SEPARATOR	YES
393	VDF	26V0505	WASHING TOWER KETTLE	YES
394	VDF	26V0601A	COOLED R142b COLLECTING TANK A	YES
395	VDF	26V0601B	COOLED R142b COLLECTING TANK B	YES
396	VDF	26V0602	CHILLED R142b COLLECTING TANK-1	YES
397	VDF	26V0701	VDF INTERMEDIATE GAS STORAGE TANK	YES
398	VDF	26V0702	HIGH PRESSURE VAPOR LIQUID SEPARATOR	YES
399	VDF	26V0703	VDF FEED TANK FOR DEGASSING TOWER	YES
400	VDF	26V0801	VDF DEGASSING TOWER KETTLE	YES
401	VDF	26V0802	VDF RECTIFYING TOWER KETTLE	YES
402	VDF	26V0803	PURE VDF DAY TANK	YES
403	VDF	26V0901	VDF RECYCLING TOWER KETTLE	YES
404	VDF	26V0902	R142B DEGASSING TOWER KETTLE	YES
405	VDF	26V0903	R142B RECTIFYING TOWER KETTLE	YES
406	VDF	26V0905	R142B RESIDUAL LIQUID TANK	YES
407	VDF	26V0904A	R142B STORAGE TANK A	YES
408	VDF	2.60E+102	R142b CONDENSER	NO
409	VDF	2.60E+110	NITROGEN HEATER	NO
410	VDF	26D0101A	SILICA GEL DRYER 101 A	YES

411	VDF	26D0102A	MOLECULAR SIEVE DRYER	YES
412	VDF	26E0201A	R142b VAPORIZER	NO
413	VDF	26E0202A	R142b HEATER	NO
414	VDF	26T0403	VDF TERTIARY CAUSTIC WASHING TOWER	NO
415	VDF	26E0502	VDF, R142b GAS MIXTURE SEPERATOR E502	NO
416	VDF	26E0503	VDF, R142b GAS MIXTURE SEPERATOR E503	NO
417	VDF	26T0502	WASHING TOWER	YES
418	VDF	26E0501	ACETONE CONDENSER	NO
419	VDF	26T0501	ACETONE TOWER	NO
420	VDF	26E0601A	VDF CHILLED WATER CONDENSER A	NO
421	VDF	26E0601B	VDF CHILLED WATER CONDENSER B	NO
422	VDF	26E0602	VDF CHILLED BRINE CONDENSER E602	NO
423	VDF	26E0603	VDF CHILLED BRINE CONDENSER E603	NO
424	VDF	26E0701	HIGH PRESS. VDF CHILLED WATER CONDENSER	NO
425	VDF	26E0702	HIGH PRESSURE VDF BRINE CONDENSER-1	NO
426	VDF	26E0703	HIGH PRESSURE VDF BRINE CONDENSER-2	NO
427	VDF	26E0801	VDF DEGASSING TOWER CONDENSER	NO
428	VDF	26E0802	VDF RECTIFYING TOWER CONDENSER	NO
429	VDF	26E0803	VDF PRODUCT COOLER	NO
430	VDF	26T0801	VDF DEGASSING TOWER	YES
431	VDF	26T0802	VDF RECTIFYING TOWER	YES
432	VDF	26E0901	VDF RECYCLING TOWER CONDENSER	NO
433	VDF	26E0902	R142B DEGASSING TOWER CONDENSER	NO
434	VDF	26E0903	R142B DISTILLATION TOWER CONDENSER	NO
435	VDF	26T0901	VDF RECYCLING TOWER	NO
436	VDF	26T0902	R142B DEGASSING TOWER	NO
437	VDF	26T0903	R142B RECTIFYING TOWER	NO
438	VDF	E-7601	VDF VENT CONDESOR	NO
439	VDF	E-7602	VDF RECIRCULATION COLLER	NO
440	VDF	26S0301	VDF FILTER - 1	NO
441	VDF	26S0302	VDF FILTER - 2	NO

442	VDF	26F0301	VDF FURNACE - 1	YES
443	VDF	26F0302	VDF FURNACE - 2	YES
444	VDF	26V0201B	F142B VAPORIZATION TANK	YES
445	VDF	26E0201B	R142b VAPORIZER	NO
446	VDF	26E0202B	R142b HEATER	NO
447	VDF	26D0601A	SILICA GEL DRYER 601 A	NO
448	VDF	26D0601B	SILICA GEL DRYER 601 B	NO
449	VDF	26D0101B	SILICA GEL DRYER 101 B	YES
450	VDF	26D0102B	MOLECULAR SIEVE DRYER	YES
451	VDF	26E0604	VDF CHILLED BRINE CONDENSER E603	NO
452	VDF	26V0603	CHILLED R142b COLLECTING TANK-3	YES
453	VDF	26V0604	CHILLED R142b COLLECTING TANK-4	YES
454	R-225	28-VE-1006	R-21 DAY TANK	YES
455	R-225	28-VE-2613	SEDIMENTATION TANK	YES
456	R-225	28-VE-2611	GAS LIQUID SEPERATOR	NO
457	R-225	28-VE-2614	MIST SEPERATOR	YES
458	R-225	28-VE-2612	PREPARATION TANK OF CATALYST	YES
459	R-225	28-VE-2615	1ST TANK	YES
460	R-225	28-HE-1001	R-21 PRE COOLER	NO
461	R-225	28-FT-1002 A	R-21 FEED FILTER-A	NO
462	R-225	28-FT-1002 B	R-21 FEED FILTER-B	NO
463	R-225	28-HE-1002	TFE HEATER	NO
464	R-225	28-TW-1001 A	TFE ABSORBER TOWER-A	YES
465	R-225	28-TW-1001 B	TFE ABSORBER TOWER-B	YES
466	R-225	28-FT-1003 A	TFE FILTER A	NO
467	R-225	28-FT-1003 B	TFE FILTER B	NO
468	R-225	28-HE-2611	NO.1 CIRCULATION COOLER	NO
469	R-225	28-HE-2611 D	NO.2 CIRCULATION COOLER	NO
470	R-225	28-SP-2611 B	NO.1 CIRCULATION MIXER	NO
471	R-225	28-SP-2611 E	NO.2 CIRCULATION MIXER	NO
472	R-225	28-HE-2613	NO.2 VENT COOLER	NO
473	R-225	28-HE-2612	NO.1 VENT COOLER	NO
474	R-225	28-SP-2611 A	NO.1 EJECTOR	NO

475	R-225	28-SP-2611 D	NO.2 EJECTOR	NO
476	R-225	28-FT-2615 A	NO.1 CRUDE 225 FILTER-A	NO
477	R-225	28-FT-2615 B	NO.1 CRUDE 225 FILTER-B	NO
478	R-225	28-FT-2616 A	NO.2 CRUDE 225 FILTER-A	NO
479	R-225	28-FT-2616 B	NO.2 CRUDE 225 FILTER-B	NO
480	R-225	28-TW-2630	NO. 1 DISTILATION TOWER	YES
481	R-225	28-HE-2630	NO. 1 TOWER REBOILER	NO
482	R-225	28-HE-2631	NO.1 TOWER CONDENSER	NO
483	R-225	28-TW-2640	NO. 2 DISTILATION TOWER	YES
484	R-225	28-HE-2641	NO.2 TOWER CONDENSER	NO
485	R-225	28-HE-2642	BY PRODUCT COOLER	NO
486	R-225	28-FT-2642	BY PRODUCT FILTER	NO
487	R-225	28-HE-2640	NO. 2 TOWER REBOILER	NO
488	R-225	28-HE-2645	NO.1 PRODUCT COOLER	NO
489	R-225	28-TW-2646 A	R-225 DEWATER TOWER-A	YES
490	R-225	28-TW-2646 B	R-225 DEWATER TOWER-B	YES
491	R-225	28-FT-2646	NO.1 DEHYDRATION FILTER	NO
492	R-225	28-HE-2647	NO.2 PRODUCT COOLER	NO
493	R-225	28-HE-2650	PRODUCT RECEIVER VENT COOLER	NO
494	R-225	28-HE-2651	PRODUCT RECEIVER CIRCULATION COOLER	NO
495	R-225	28-TW-8638 A	NO 3. DEHYDRATING TOWER	NO
496	R-225	28-FT-1001	DEHYDRATION FILTER	NO
497	R-225	28-TW-2656 A	PRODUCT DEWATER TOWER-A	YES
498	R-225	28-TW-2656 A	PRODUCT DEWATER TOWER-B	YES
499	R-225	28-FT-2656	NO.2 DEHYDRATION FILTER	NO
500	R-225	28-FT-2657	NO.3 DEHYDRATION FILTER	NO
501	R-225	28-HE-2655	STORAGE TANK VENT COOLER	NO
502	R-225	28-HE-2656	STORAGE TANK CIRCULATION COOLER	NO
503	FI	R2301A	HIGH PRESSURE REACTOR-A	YES
504	FI	R2301B	HIGH PRESSURE REACTOR-B	YES
505	FI	R2302	CHLORINATION REACTOR	YES

506	PVDF	27V0101A	VDF MONOMER TANK	YES
507	PVDF	27V0101B	VDF MONOMER TANK	YES
508	PVDF	27G0101	VDF COMPRESSOR	NO
509	PVDF	27V0102	MONOMER SEPERATOR	YES
510	PVDF	27V0103	EXPANSION TANK	NO
511	PVDF	27V0206	REACTOR JACKET WATER BUFFER TANK	NO
512	PVDF	27R0201	POLYMERIZATION REACTOR	YES
513	PVDF	27V0207	DEGASSING TANK	YES
514	PVDF	270V301A	LATEX TANK	YES
515	PVDF	27V0301B	LATEX TANK	YES
516	PVDF	27V0302A	COAGULATION TANK	YES
517	PVDF	27V0302B	COAGULATION TANK	YES
518	PVDF	270V701	VACUUM BUFFER TANK	YES
519	PVDF	27V0801	HFP METERING TANK	NO
520	Reactor-8,9	V501H	Monomer Storage Tank	YES
521	Reactor-8,9	E501H	Monomer Condenser	NO
522	Reactor-8,9	V502H	Monomer Metering Tank-H	YES
523	Reactor-8,9	V502J	Monomer Metering Tank-J	YES
524	Reactor-8,9	A501H	Silica Gel Absorber-H	NO
525	Reactor-8,9	E502H	Stabilizer coagulator-H	NO
526	Reactor-8,9	R501H	Polymerization reactor-H	YES

8.2 GUIDE LINE FOR TRAINING OF PERSONAL

Company is very much proactive on accident prevention programs and initiated many programs including training. Company has prepared training procedures and implemented it rigorously.

Following Training Procedure has been in place.

- Every month Tool box talk training is conducted to contract employees by site safety team also regular training/ TBT are carried out by the contract safety team.
- Some external training is conducted by the subject matter expert like, Road Safety training, Working at height, Respiratory Protection, First aider, fire fighter, Rescue training, etc.
- Training schedule is as below.

Month	Training Topic	Facilitator
	Emergency Preparedness	
	Safety Precaution During Hot work	
	Cl2 Emergency Kit	
	Basic of Fire and Use of Fire extinguisher	
	Risk Analysis Of WPS Element Confined Space	
	Safety during Chemical Handling	
	Manual Handling	
	Risk Analysis Of WPS Element Height Work	
	Use & Operating SCBA Set	
	Risk Analysis Of WPS Element Use of PPE's.	
	Environmental aspect impact	
	Leakage and spillage	
	Safety Observation /Portal	
	Incident investigation portal	
	Hazardous waste management	

8.3 ALLOCATION AND DELEGATION OF RESPONSIBILITIES FOR PLANT SAFETY

Company has considered safety as a line responsibility by the top management. In line with this directives and principal, all the levels of organization have been given / delegated with responsibilities for operating plant safely.

Organization Structure is also given below, which evident the direct reporting of the safety executives to president of the company.

SEF Department List		
Sr No.	**Name**	**Designation**
1.		Senior VP HSEF
2.		Senior GM HSEF
3.		Chief manager HSEF
4.		Chief manager HSEF
5.		MBBS- FMO
6.		MBBS- FMO
7.		Asst. Manager HSEF
8.		Asst. Manager HSEF
9.		Asst. Manager HSEF
10.		Asst. Manager HSEF
11.		Officer HSEF
12.		Officer HSEF
13.		Officer HSEF
14.		GET HSEF

8.4 IMPLEMENTATION OF SAFETY PROCEDURES

1. Various work permit systems have been developed, introduced and implemented to carry out jobs safely

   Important once are:

   - Cold Work
   - Hot Work
   - Confined Space
   - Excavation
   - Work at Height
   - Line Braking
   - Radiography
   - Hydraulic / Pneumatic System

   Along with above significant operating procedures, company has developed number of SOPs for safe process operation and processes. The list has been verified on company portal. It is available plant wise. It for start-up, Normal running and shutdown of the plant. Procedure for emergency shutdown is also available.

2. Work area monitoring was carried out on regular basis to monitor exposure of hazardous chemicals and physical agents like noise. All data has been recorded in Form No-37 and maintained.
3. All the pressure vessel and plants, lifting tools and tackle and hoist and lift have been inspected and tested at stipulated time by competent person and records are maintained in form No- 9, 10, and 11
4. Health check-up has been done on regular basis by FMO all the employees and records have been maintained in Form no-32 and 33.
   - Pre & Post medical check-up is carried out
   - Periodic medical check-up is carried out every year and counselling is done by Factory Medical Officer (FMO)
   - Quarterly physical medical check-up is carried out for all employees
   - Audiometric checkup is carried out every quarter
5. On Site emergency plan has been rehearsed on regular basis and deficiencies have been identified and corrected time to time.
6. Majority of the incident/ accidents have been investigated and preventive action have been taken to stop recurrences,

CHAPTER 09: INFORMATION ON ASSESMENT OF CONSEQUENCES OF MAJOR ACCIDENTS

9.1 ASSESSMENT OF POSSIBLE RELEASE OF HAZARDOUS CHEMICALS OR OF ENERGY

As discussed earlier, potential hazards of the major accident will be due to sudden and unexpected release of the hazardous chemical in to the atmosphere which will in turn catch fire or can explode to release huge amount of the energy in to the atmosphere which may cause severe damage to the property and life of the living animals and flora and fauna.

A Maximum Credible Accident (MCA) is an accident with maximum damage potential, which is believed to be credible in a hazardous installation.

Major incidents identified for GFL, based on historical accident experiences of Chemical industry are as follows:

a) Inadequate design against internal pressure, external forces, corrosion and temperature.

b) Toxic gas release.

c) Mechanical failure of Pipes, Vessels, elbows due to corrosion, erosion, impact, liquid expansion, weld failure etc.

d) Failure of manual / automatic control system.

e) Unsafe operation / maintenance including wrong operation of valve, mixing or overflowing of liquid chemicals.

f) Leakages and spillage of flammable material.

g) Uncontrolled vehicle movement.

h) Any source of Ignition to flammable liquid may be the reason of emergency.

i) Tanker loading/unloading operations in limited space areas.

j) Change control procedure and documents update for process safety information and PHA.

k) Multiproduct facility with varying chemicals use for short duration.

l) Power outage

a. EFFECTS OF RELEASES OF HAZARDOUS SUBSTANCES

Whenever any release of materials takes place it will be in gas, liquid or in two phase state with particular velocity. If material is in gas phase, then with this initial discharge velocity the material travelled to some distance and then due to educator effect surround air will get sucked into the released vapor cloud. Then the vapor cloud will start dispersing in the downwind direction with the wind velocity. This dispersion is calculated as per Gaussian dispersion model.

In case of liquid release it may form pool and from pool vaporization will take place. This vaporized material will be dispersed in downwind direction.

1) EXPLOSION: -

When a large amount of flammable vaporizing liquid or gas is rapidly released, a vapor cloud forms and dispersed with the surrounding air. The release can occur from a storage tank, process, transport vessel, or pipeline. The cloud is ignited before the cloud is diluted below its lower flammability limit (LFL), a Vapor Cloud Explosion (VCE) or flash fire will occur. For CA modelling the main consequence of a VCE is an over pressure that result while the main consequence of flash is direct flame contact and thermal radiation. The resulting outcome, either a flash fire or a VCE depends on following parameters.

- The release material must be flammable.
- A cloud of sufficient size must form prior to ignition, with ignition delays of from 1 to 5 min considered the most probable for generating vapour cloud explosions.
- A sufficient amount of the cloud must be within the flammable range.
- Sufficient confinement or turbulent mixing of a portion of the vapour cloud must be present.

A major hazard associated with any explosion is overpressure. Overpressure, also called blast wave, refers to the sudden onset of a pressure wave after an explosion. This pressure wave is caused by the energy released in the initial explosion—the bigger the initial explosion, the more damaging the pressure wave. Pressure waves are nearly instantaneous, travelling at the speed of sound.

Although a pressure wave may sound less dangerous than a fire or hazardous fragments, it can be just as damaging and just as deadly. The pressure wave radiates outward like a giant burst of air, crashing into anything in its path (generating hazardous fragments). If the pressure wave has enough power behind it, it can lift people off the ground and throw them up against nearby buildings or trees. Additionally, blast Waves can damage buildings or even knock them flat— often injuring or killing the people inside them.

The sudden change in pressure can also affect pressure-sensitive organs like the ears and lungs. The damaging effects of the overpressure will be greatest near the source of the explosion and lessen as you move further from the source.

2) POOL FIRES: -

A pool fire may result via a number of scenarios. It begins typically with the release of flammable material from process equipment. If the material is liquid, stored at a temperature below its normal boiling point, the liquid will collect in the pool. The geometry of the pool is directed by the surroundings (i.e. dyke). But an unconstrained pool in an open, flat area is possible, particularly if the liquid quantity spilled is inadequate to completely fill the dyked area.

If the liquid is stored under pressure above its normal boiling point, then fraction of the liquid will flash into vapour, with unflushed liquid remaining to form a pool in the vicinity of the release

Once a liquid pool has formed, an ignition source is required. Each release has a finite probability of ignition and must be evaluated. The ignition can occur via the vapour cloud (for flashing liquid), with the flame travelling upwind via the vapour to ignition the liquid pool. For liquid stored below the normal boiling point without flashing, the ignition can still occur via the flammable vapour from the evaporating liquid.

Both these cases may result in an initial flash fire due to burning vapors- this may cause initial thermal hazards.

Once an ignition has occurred, a pool fire results and the dominant mechanism for damage via thermal effects, primarily via radiative heat transfer from the resulting flame. If the release of flammable material from the process equipment continues, then a jet fire is also likely. If the ignition occurs at the very beginning of the release, then in adequate time is available for the liquid to form a pool and only a jet fire will result. Generally, the Pool fire tends to be localized in effect and hence it is mainly of concern in establishing the potential for domino effects and employee safety zones, rather than for community risk.

The primary effect of such fires is due to thermal radiation from the flame source. Issues of inter tank and interplant spacing, thermal insulation, fire wall specification, etc., can be addressed on the basis of specific consequence analysis for a range of possible pool fire scenarios.

3) JET FIRES: -

A jet fire, also referred to as a flame jet, occurs when a flammable chemical is rapidly released from an opening in a container and immediately catches on fire—much like the flame from a blowtorch. It can be modelled a jet fire from the Gas Pipeline and Tank sources. For the Tank source, it can be modelled gas and two-phase jet fires. A two-phase jet fire occurs when a gas that has been liquefied under pressure is released. Because the liquid evaporates as it escapes, the chemical is released as an aerosol spray—that is, a mixture of gas and tiny liquid droplets. ALOHA assumes the jet fire release is oriented vertically, although the wind can tilt the flames in the downwind direction. Thermal radiation is the primary hazard associated with a jet fire. Other potential jet fire hazards include smoke, toxic by-products from the fire, and secondary fires and explosions in the surrounding area, although ALOHA does not model these hazards.

4) FLASH FIRES: -

A flash fire is the non-explosive combustion of vapor cloud resulting from a release of flammable material into the open air. Experiments have shown that vapor clouds only explode in areas where intensely turbulent combustion develops and only if certain conditions are met. Major hazards from flash fires are from thermal radiation and direct flame contact.

Flash fire models- if based on flam radiation- are subject to large error if radiation is estimated correctly, because predicted radiation varies with the fourth power of temperature.

Typically, the burning zone is estimated by first performing a dispersion model and defining the burning zone from the ½ LFL limit back to the release point, even though the vapour concentration might be above the UFL. Turbulence induced combustion mixes this material with air and burns it.

5) FIRE BALL: -

The burning of a flammable gas cloud, the bulk of which is initially over rich (i.e. above the upper flammable limit). The whole cloud appears to be on fire as combustion is taking place at eddy boundaries where air is entrained (i.e. a propagating diffusion flame). The buoyancy of the hot combustion products may lift the cloud form the ground, subsequently forming a mushroom shaped cloud. Combustion rates are high and the hazard is primarily thermal.

ALOHA provides output as amount of chemical discharged from the source as well as its concentration in air it takes in to account different levels of concentrations for a specified chemical. Different concentration levels are given below:

ERPG 1: is the maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to 1 hour without experiencing other than mild transient adverse health effects or perceiving a clearly defined, objectionable odour.

ERPG 2: is the maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to 1 hour without experiencing or developing irreversible or other serious health effects or symptoms which could impair an individual's ability to take protective action.

ERPG 3: is the maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to 1 hour without experiencing or developing life-threatening health effects.

IDLH: The Immediately Dangerous to Life or Health (IDLH) level. A chemical's IDLH is an estimate of the maximum concentration in the air to which a healthy worker could be exposed without suffering permanent or escape-impairing health effects.

In order to assess the damage, the damage criteria have to be first defined.

There are three principle types of exposures to hazardous effects

1.0 Heat radiation from a jet, pool fire, a flash fire or a BLEVE

2.0 Explosion,

3.0 Toxic effects, from toxic materials or toxic combustion products

Atmospheric Stability Classes

- A basis for the weather conditions (Temperature, wind speed etc.) is chosen for input in these models.
- The atmosphere may be more or less turbulent at any given time, depending on the amount of incoming solar radiation as well as other factors. Meteorologists have defined six atmospheric stability classes, each representing a different degree of turbulence in the atmosphere.
- **Unstable (Class- A & B):** When moderate-to-strong incoming solar radiation heats air near the ground—causing it to rise and generating large eddies—the atmosphere is considered unstable (relatively turbulent). Unstable conditions are associated with atmospheric stability classes A and B.
- **Neutral (Class- C & D):** Stability classes C and D represent conditions of more neutral stability (moderate turbulence). Neutral conditions are associated with relatively strong wind speeds and moderate solar radiation.
- **Stable (Class- E & F):** When solar radiation is relatively weak or absent, air near the surface has a reduced tendency to rise, and less turbulence develops. In this case, the atmosphere is considered stable (less turbulent), the wind is weak, and the stability class would be E or F.

9.2 POSSIBLE DISOPERATION OF RELEASED OF RELEASES (SIZE OF THE AFFECTED AREA, HEALTH EFFECTS PROPERTY DAMAGE)

PART A :

Quantitative Risk Assessment (QRA) for the Chlorine buffer vessel system at Dahej has been done using PHAST software

CHLORALKALI PLANT

1. Release from Chlorine Buffer Vessel- Toxic
2. Release H2 gas from Electrolyser outlet - Flash Fire/ VCE
3. Release of H2 gas from Electrolyser outlet – Jet Fire
4. Release from H2 Gas line to Caustic Flaking Plant - VCE
5. Release from H2 Gas line to Caustic Flaking Plant – Jet Fire

CMS Plant

1. Release from Methanol Daily Tank (V- 2101 C) Failure - VCE
2. Release from Methanol Daily Tank (V-2101 C) Failure - Pool Fire
3. Release from Methanol Unloading Arm – VCE
4. Release from Methanol Unloading Arm – Pool Fire
5. Release from Methanol Evaporator (E- 2102) at outlet - VCE
6. Release from Methanol Evaporator (E- 2102) at outlet - Jet Fire
7. Release from Methanol Super heater (E- 2104) at outlet - VCE
8. Release from Methanol Super heater (E- 2104) at outlet - Jet Fire
9. Release from Methanol Inlet to Hydro Chlorination Reactor (R-2101) - VCE
10. Release from Methanol Inlet to Hydro Chlorination Reactor (R-2101) - Jet Fire

PART B

Credible Loss Scenarios for the facility under the study was carried out by discussion with GFL. Simulated loss Scenarios to determine the vulnerable zones for toxic dispersion, pool fire or jet fire, (Thermal Radiation), Flash fire, Explosion over pressure (Vapour cloud Explosion, Ball fire using software packages HAMSGAP.

1. Scenario –1 Pool Fire for Methanol road tanker catastrophic failure
2. Scenario –2 Tank on Fire simulation for Methanol storage tank catastrophic failure
3. Scenario –3,4,5,6 simulation for Methanol storage tank catastrophic failure
4. Scenario –7 Spill Pool Evaporation For Methylene Dichloride tank Catastrophic Failure
5. Scenario –8 Spill Pool Evaporation For Carbon Tetrachloride tank Catastrophic Failure

6. Scenario – 9 Spill Pool Evaporation For Chloroform tank Catastrophic Failure
7. Scenario –10 Spill Pool evaporation module for Oleum 100 MT Tank catastrophic failure
8. Scenario – 11 Spill Pool evaporation module for Sulphuric Acid Storage Tank catastrophic failure
9. Scenario – 12 Puff Release for Hydrofluoric Acid 25 m3 Bullet catastrophic failure
10. Scenario – 13 Spill Pool Evaporation for Hydrofluoric Acid 25m^3 Bullet catastrophic failure

PART A :

Scenario 1: Release from Chlorine Buffer Vessel System – Toxic

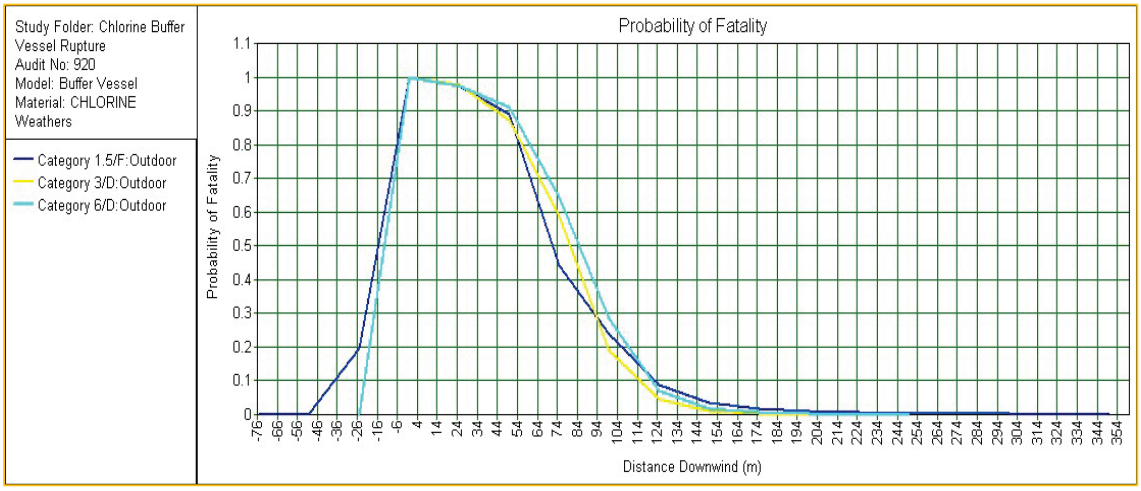
Parameters

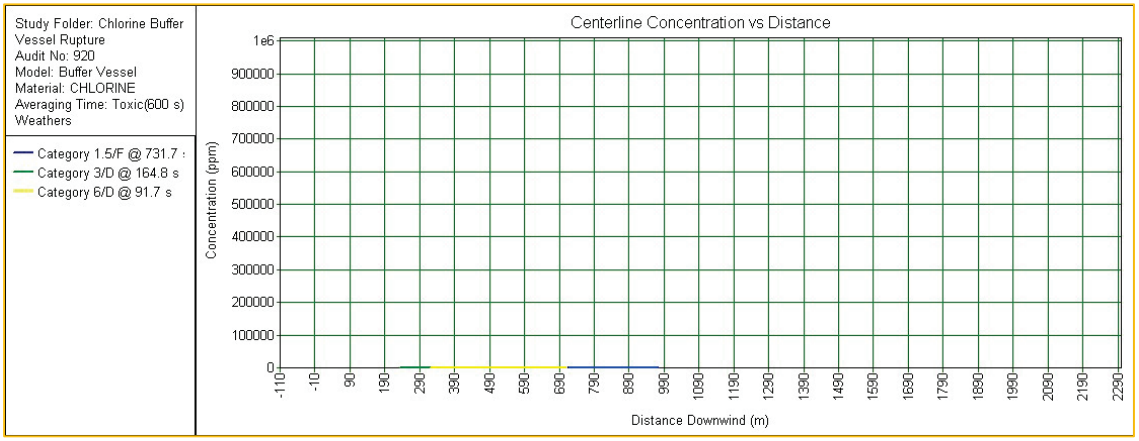
Temperature - 32°C

Pressure- 4 Kg/ cm^2

Inventory- 7.5 m^3

IDLH Concentration (10 ppm)	Distance (m)		
	F (1.5 m/s)	D (3 m/s)	D (6 m/s)
	325 m	200	225





Scenario 2: Release H_2 gas from Electrolyser outlet - Flash Fire/ VCE

Parameters

Temperature - 89^0C

Pressure - 4400 MMWC

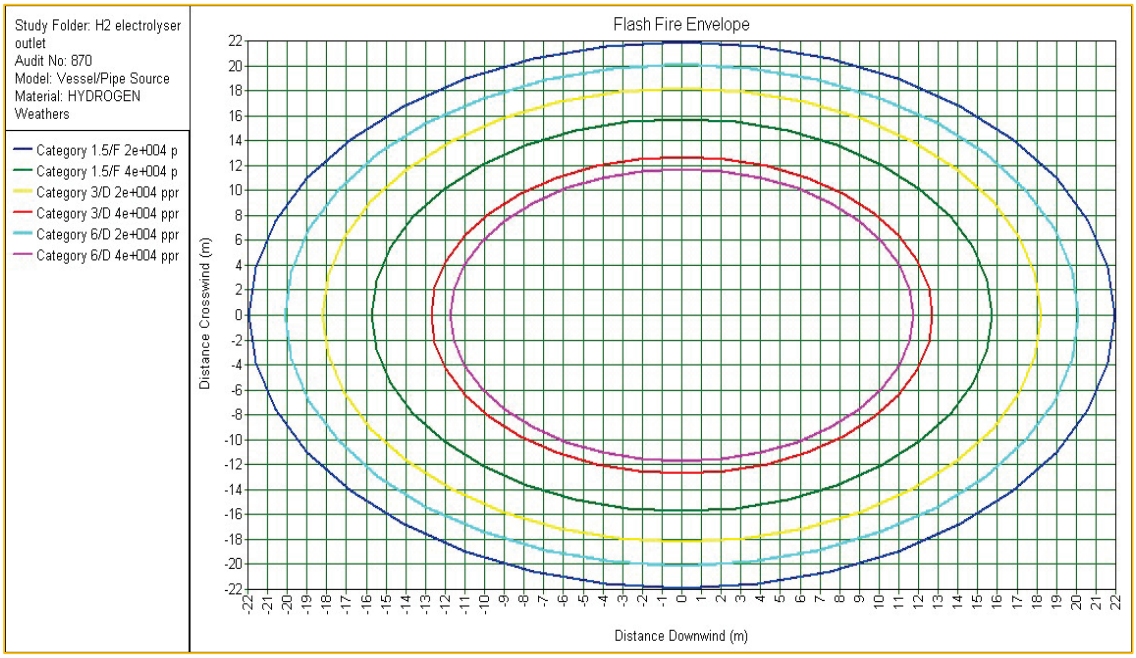
Flow Rate - 93800 nm3/Day

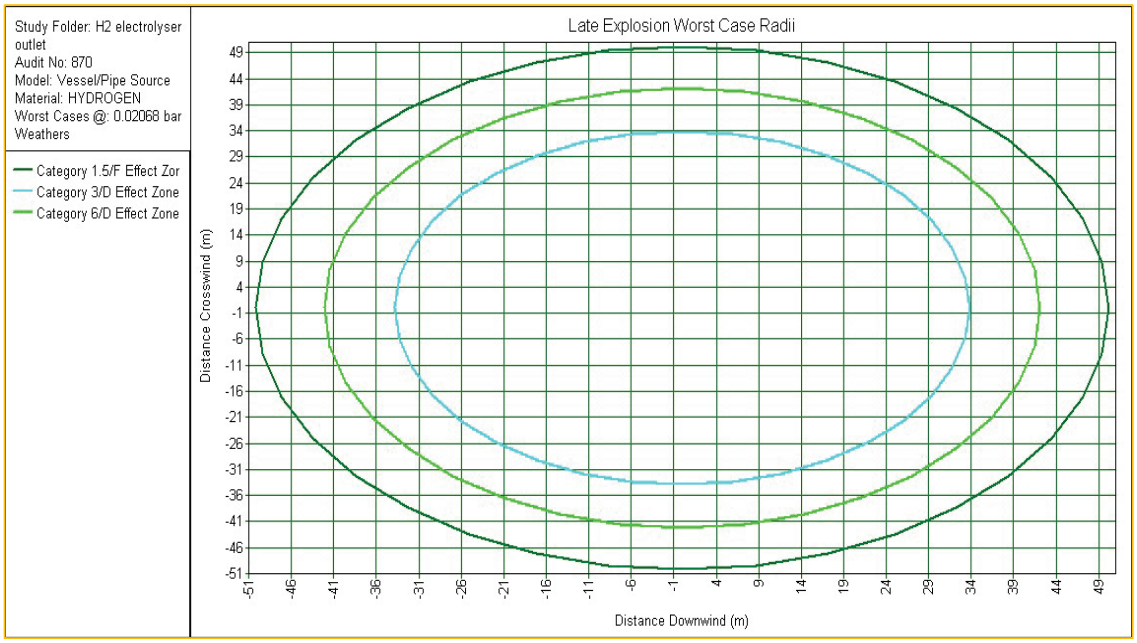
Flash Fire Model

Concentration (ppm)	Distance (m)		
	F (1.5 m/s)	D (3 m/s)	D (6 m/s)
20000	21.9285	18.2119	20.1147
40000	15.7337	12.7136	11.7346

Vapour Cloud Explosion Model

Over Pressure (bar)	Effect Distance (m)		
	F (1.5 m/s)	D (3 m/s)	D (6 m/s)
0.02068	50.1542	33.823	42.0899
0.1379	27.8077	16.1684	25.7196
0.2068	26.0414	14.7729	24.4257


Study Folder: H2 electrolyser outlet
Audit No: 870
Model: Vessel/Pipe Source
Material: HYDROGEN
Weathers
Category 1.5/F 2e+004 p
Category 1.5/F 4e+004 p
Category 3/D 2e+004 ppr
Category 3/D 4e+004 ppr
Category 6/D 2e+004 ppr
Category 6/D 4e+004 ppr
Flash Fire Envelope
Distance Crosswind (m)
Distance Downwind (m)


Study Folder: H2 electrolyser outlet
Audit No: 870
Model: Vessel/Pipe Source
Material: HYDROGEN
Worst Cases @: 0.02068 bar
Weathers
Category 1.5/F Effect Zor
Category 3/D Effect Zone
Category 6/D Effect Zone
Late Explosion Worst Case Radii
Distance Crosswind (m)
Distance Downwind (m)

Scenario 3: Release of H_2 gas from Electrolyser outlet – Jet Fire

Parameters

Temperature - 89°C

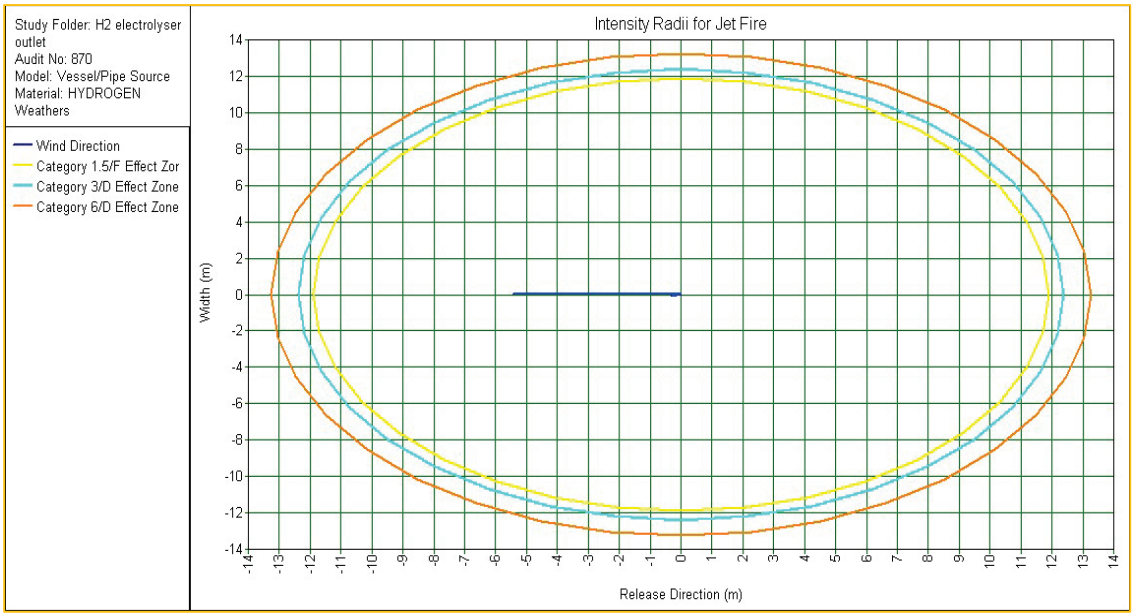
Pressure - 4400 MMWC

Flow Rate - 93800 nm^3/ Day

Heat Radiation Model

Flame Length - 11.26 m

Percent Lethality	Thermal Load (kW/m^2)	Effect Distance (m)		
		F (1.5 m/s)	D (3 m/s)	D (6 m/s)
First Degree Burns	4.0	11.8918	12.382	13.2565
1	9.33	9.4448	10.0838	11.6294
10	12.70	8.70763	8.70763	11.0811
50	18.47	Not Reached	Not Reached	10.1482
99	36.56	Not Reached	Not Reached	Not Reached



Scenario 4: Release from H_2 Gas line to Caustic Flaking Plant - Flash Fire/ VCE

Parameters

Temperature - 40^0C

Pressure - 2500 mmWC

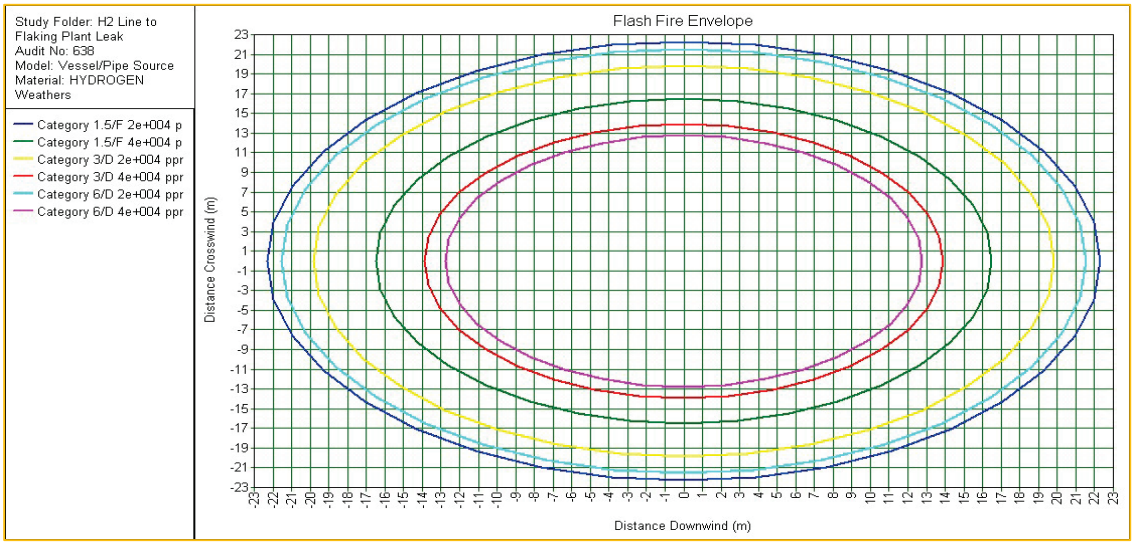
Flow Rate - 1000 nm3/hr

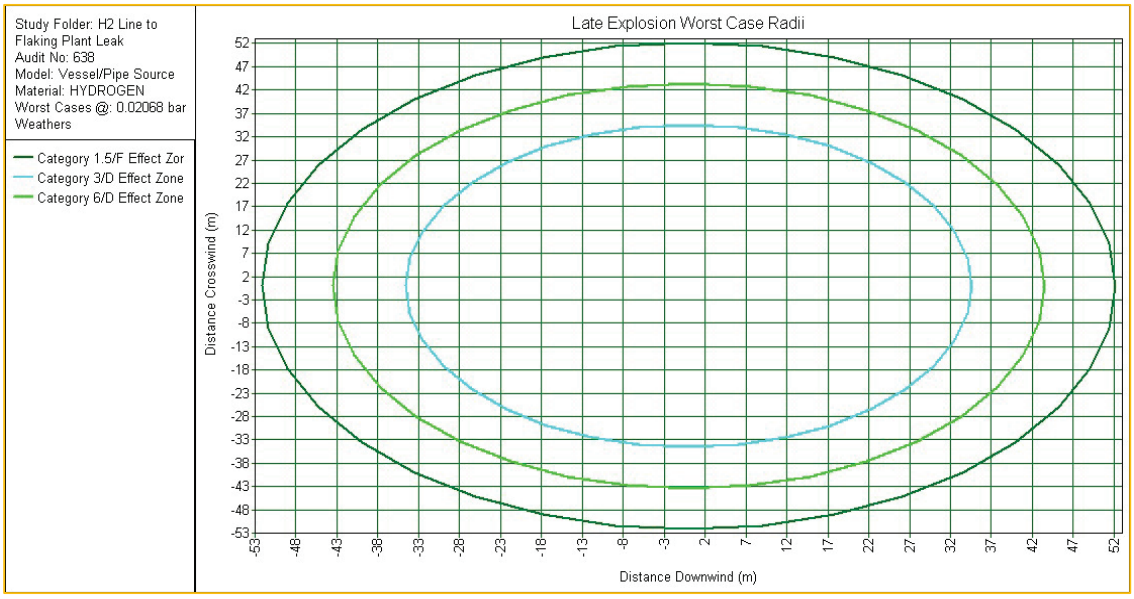
Flash Fire Model

Concentration (ppm)	Distance (m)		
	F (1.5 m/s)	D (3 m/s)	D (6 m/s)
20000	22.2891	19.8277	21.5254
40000	16.4833	13.908	12.7666

Vapour Cloud Explosion Model

Over Pressure (bar)	Effect Distance (m)		
	F (1.5 m/s)	D (3 m/s)	D (6 m/s)
0.02068	52.1537	34.576	43.4813
0.1379	28.3254	16.3633	26.0799
0.2068	26.442	14.9238	24.7045


Study Folder: H2 Line to Flaking Plant Leak
Audit No: 638
Model: Vessel/Pipe Source
Material: HYDROGEN
Weathers
Category 1.5/F 2e+004 p
Category 1.5/F 4e+004 p
Category 3/D 2e+004 ppr
Category 3/D 4e+004 ppr
Category 6/D 2e+004 ppr
Category 6/D 4e+004 ppr
Flash Fire Envelope
Distance Crosswind (m)
Distance Downwind (m)


Study Folder: H2 Line to Flaking Plant Leak
Audit No: 638
Model: Vessel/Pipe Source
Material: HYDROGEN
Worst Cases @: 0.02068 bar
Weathers
Category 1.5/F Effect Zor
Category 3/D Effect Zone
Category 6/D Effect Zone
Late Explosion Worst Case Radii
Distance Crosswind (m)
Distance Downwind (m)

Scenario 5: Release from H_2 Gas line to Caustic Flaking Plant – Jet Fire

Parameters

Temperature - 40°C

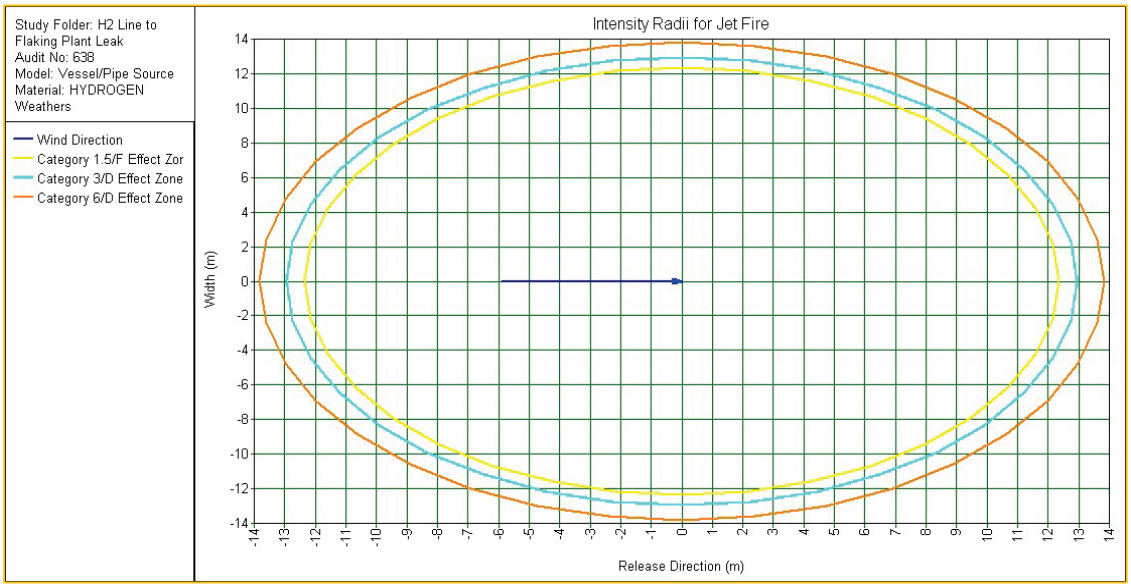
Pressure - 2500 MMWC

Flow Rate - 1000 nm^3/Day

Heat Radiation Model

Flame Length - 11.66 m

Percent Lethality	Thermal Load (kW/m^2)	Effect Distance (m)		
		F (1.5 m/s)	D (3 m/s)	D (6 m/s)
First Degree Burns	4.0	12.3359	12.932	13.8259
1	9.33	9.68516	10.5143	12.2181
10	12.70	9.10495	9.9664	11.5592
50	18.47	Not Reached	Not Reached	10.8691
99	36.56	Not Reached	Not Reached	Not Reached



CONSEQUENCE ANALYSIS CALCULATIONS FOR CHLOROMETHANES PLANT

Scenario 6: Release from Methanol Unloading Arm - Flash Fire/ VCE

Parameters

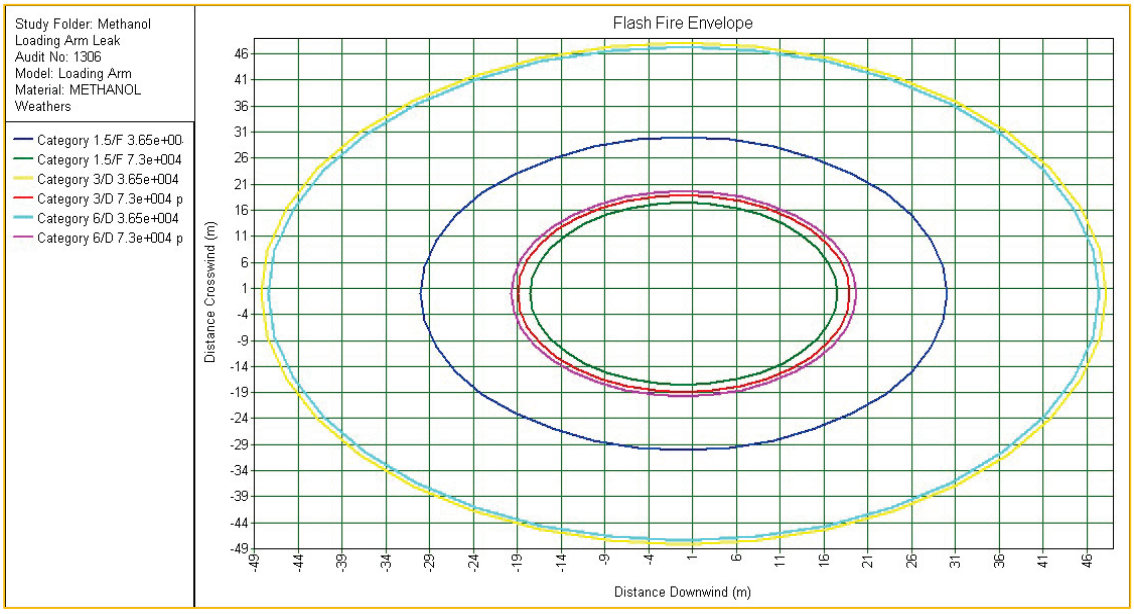
Temperature	-	35-40^{0}C
Pressure	-	Atmospheric
Flow Rate	-	20 m^3/ hr

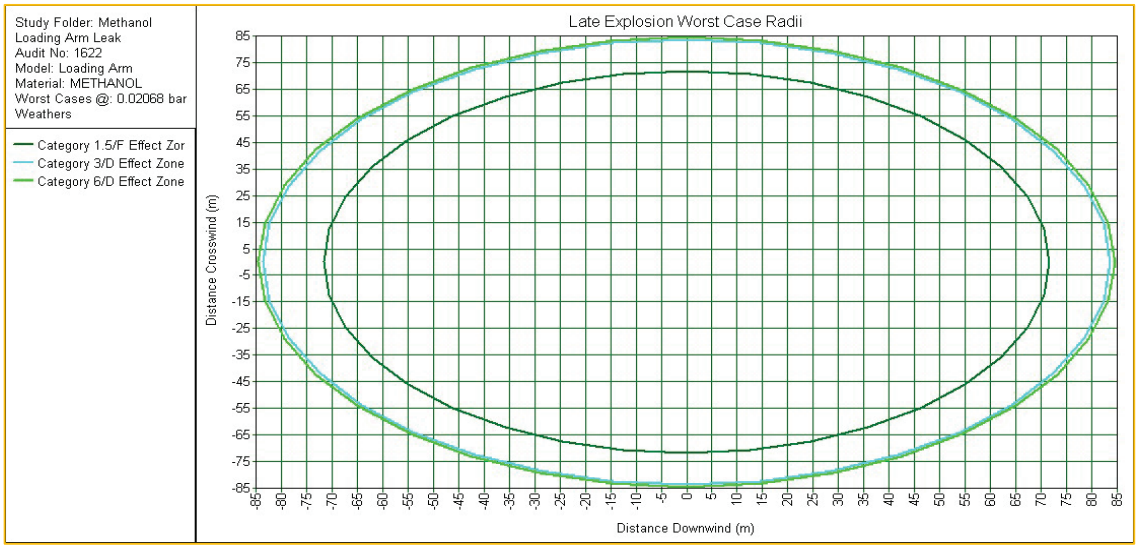
Flash Fire Model

Concentration (ppm)	Distance (m)		
	F (1.5 m/s)	D (3 m/s)	D (6 m/s)
36500	30.0003	48.2148	47.4149
73000	17.5223	18.9561	19.6887

Vapour Cloud Explosion Model

Over Pressure (bar)	Effect Distance (m)		
	F (1.5 m/s)	D (3 m/s)	D (6 m/s)
0.02068	71.6544	83.6521	84.5012
0.1379	40.7854	51.3026	51.5225
0.2068	38.3455	48.7457	48.9158


Study Folder: Methanol
Loading Arm Leak
Audit No: 1306
Model: Loading Arm
Material: METHANOL
Weathers
Category 1.5/F 3.65e+00
Category 1.5/F 7.3e+004
Category 3/D 3.65e+004
Category 3/D 7.3e+004 p
Category 6/D 3.65e+004
Category 6/D 7.3e+004 p
Flash Fire Envelope
Distance Crosswind (m)
Distance Downwind (m)


Study Folder: Methanol
Loading Arm Leak
Audit No: 1622
Model: Loading Arm
Material: METHANOL
Worst Cases @: 0.02068 bar
Weathers
Category 1.5/F Effect Zor
Category 3/D Effect Zone
Category 6/D Effect Zone
Late Explosion Worst Case Radii
Distance Crosswind (m)
Distance Downwind (m)

Scenario 7: Release from Methanol Unloading Arm – Pool Fire

Parameters

Temperature - 35-40°C

Pressure - Atmospheric

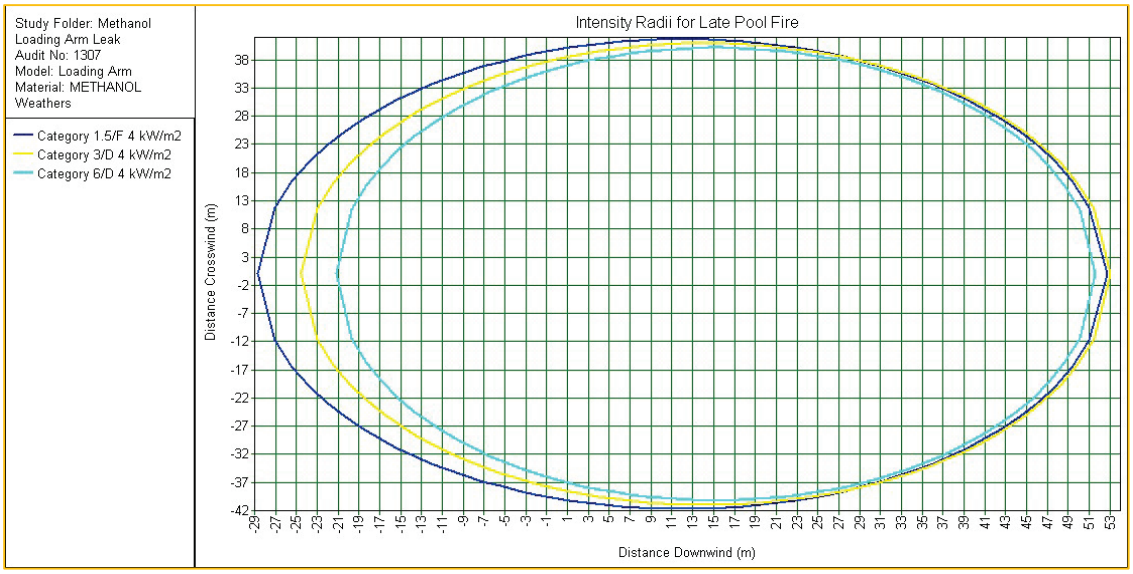
Flow Rate - 20 m^3/ hr

Heat Radiation Model

Exposure Duration - 20

sec Effective Diameter of the pool - 15.35 m

Percent Lethality	Thermal Load (kW/m^2)	Effect Distance (m)		
		F (1.5 m/s)	D (3 m/s)	D (6 m/s)
First Degree Burns	4.0	52.699	53.0267	51.5853
1	9.33	39.645	40.8154	40.4271
10	12.70	36.1124	37.3381	37.2994
50	18.47	32.3931	33.5776	33.9684
99	36.56	26.5618	28.417	28.9181



Scenario 8: Release from Methanol Daily Tank (V-2101 C) Failure - Flash Fire/ VCE

Parameters

Temperature - 35-40^{0}C

Pressure - 0.1 kg/ cm^2 G

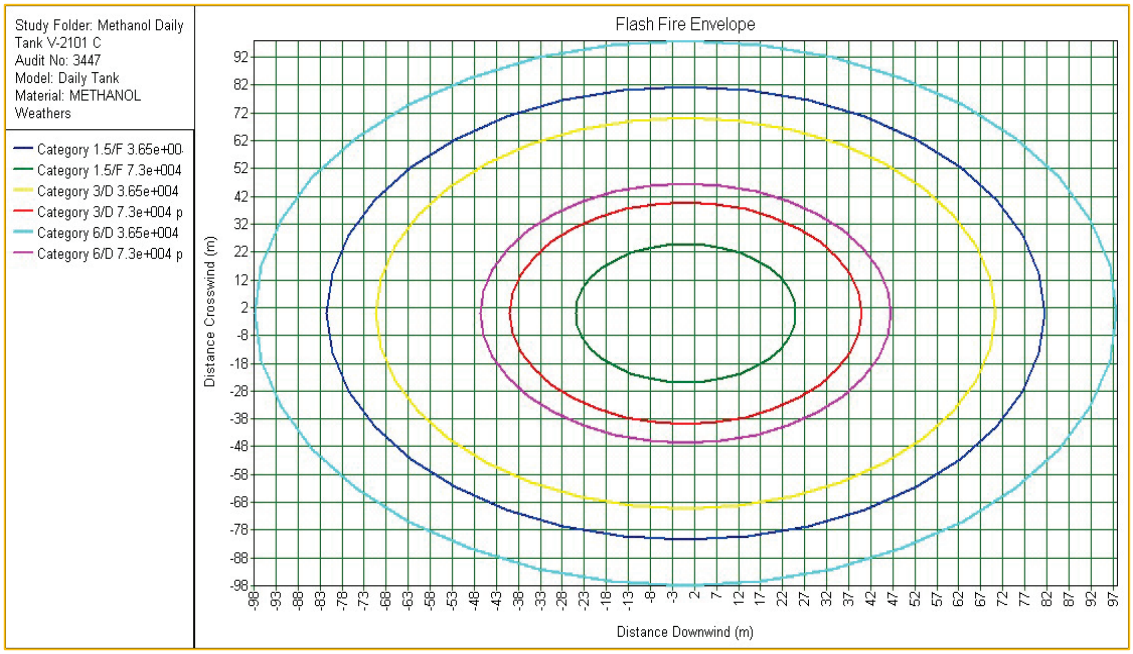
Flow Rate - 147 m^3

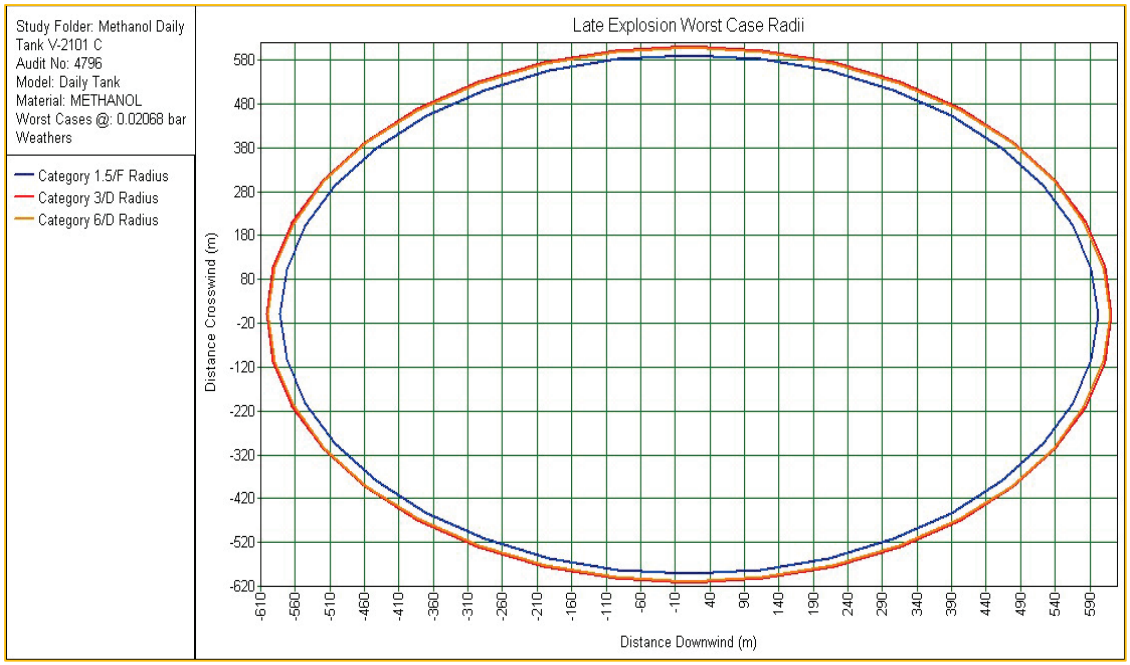
Flash Fire Model

Concentration (ppm)	Distance (m)		
	F (1.5 m/s)	D (3 m/s)	D (6 m/s)
36500	81.4743	70.2712	97.8151
73000	25.0039	39.8688	46.5561

Vapour Cloud Explosion Model

Over Pressure (bar)	Effect Distance (m)		
	F (1.5 m/s)	D (3 m/s)	D (6 m/s)
0.02068	601.81	621.357	619.207
0.1379	163.234	168.3	167.739
0.2068	128.569	132.489	132.055


Study Folder: Methanol Daily Tank V-2101 C
Audit No: 3447
Model: Daily Tank
Material: METHANOL
Weathers
Category 1.5/F 3.65e+00
Category 1.5/F 7.3e+004
Category 3/D 3.65e+004
Category 3/D 7.3e+004 p
Category 6/D 3.65e+004
Category 6/D 7.3e+004 p
Flash Fire Envelope
Distance Crosswind (m)
Distance Downwind (m)


Study Folder: Methanol Daily Tank V-2101 C
Audit No: 4796
Model: Daily Tank
Material: METHANOL
Worst Cases @: 0.02068 bar
Weathers
Category 1.5/F Radius
Category 3/D Radius
Category 6/D Radius
Late Explosion Worst Case Radii
Distance Crosswind (m)
Distance Downwind (m)

Scenario 9: Release from Methanol Daily Tank (V-2101 C) Failure - Pool Fire

Parameters

Temperature - 35-40°C

Pressure - 0.1 kg/ cm^2 G

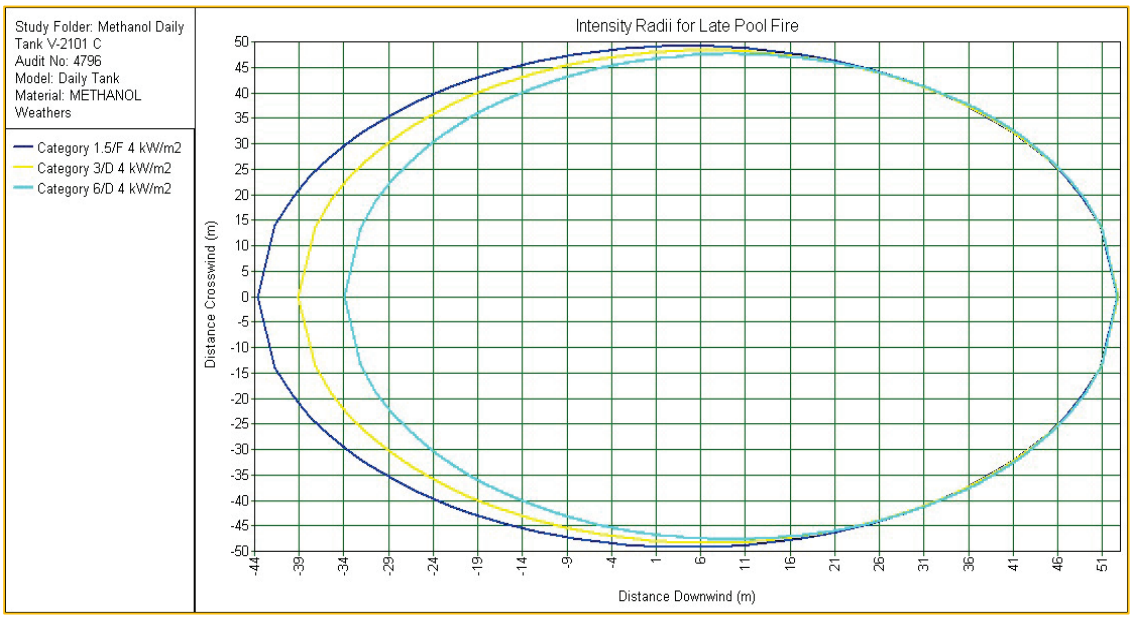
Flow Rate - 147 m^3

Heat Radiation Model

Exposure Duration - 20

Sec Effective Diameter of the pool - 18.71 m

Percent Lethality	Thermal Load (kW/m^2)	Effect Distance (m)		
		F (1.5 m/s)	D (3 m/s)	D (6 m/s)
First Degree Burns	4.0	52.6772	52.7581	52.7049
1	9.33	37.3275	38.3806	39.4857
10	12.70	33.2051	34.2893	35.7823
50	18.47	28.8195	29.9023	31.8345
99	36.56	21.9674	23.8172	25.9013



Scenario 10: Release from Methanol Evaporator (E-2102) at outlet - Flash Fire/ VCE

Parameters

Temperature - 120^0C

Pressure - 5.3 kg/ cm^2 G

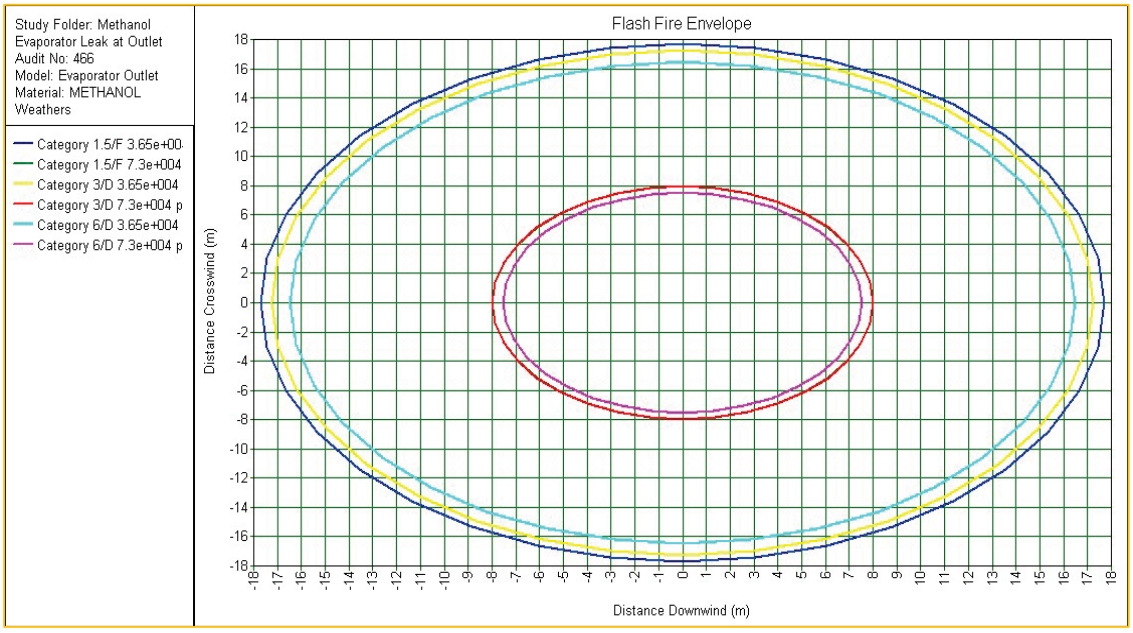
Flow Rate - 1550 Nm^3/ hr

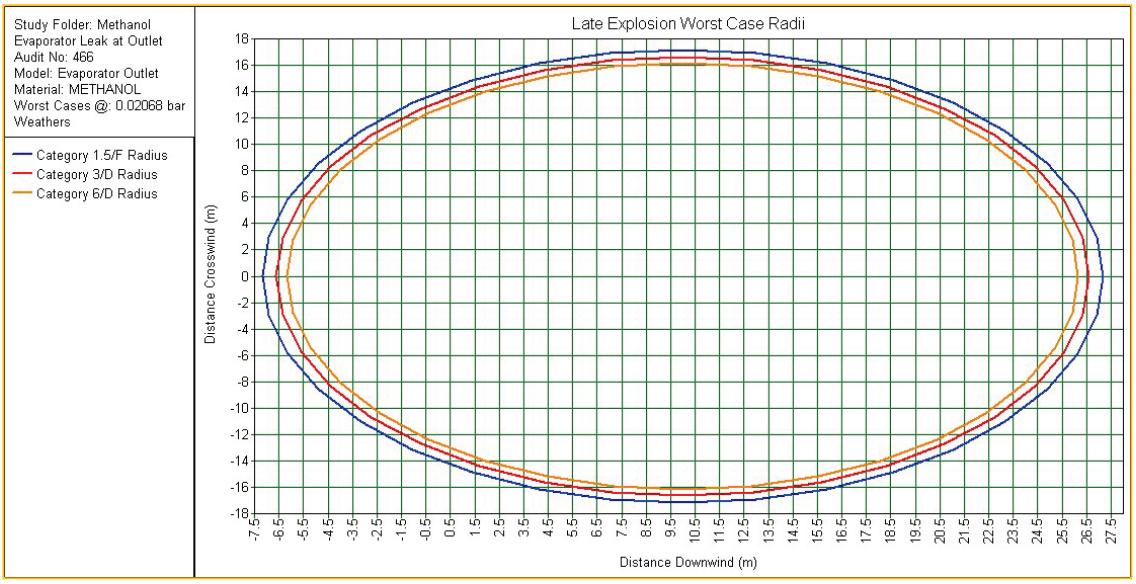
Flash Fire Model

Concentration (ppm)	Distance (m)		
	F (1.5 m/s)	D (3 m/s)	D (6 m/s)
36500	17.7029	17.2497	16.4717
73000	7.9846	7.99073	7.5251

Vapour Cloud Explosion Model

Over Pressure (bar)	Effect Distance (m)		
	F (1.5 m/s)	D (3 m/s)	D (6 m/s)
0.02068	27.1831	26.6119	26.158
0.1379	14.4491	14.3012	14.1827
0.2068	13.4426	13.3282	13.2373


Study Folder: Methanol Evaporator Leak at Outlet
Audit No: 466
Model: Evaporator Outlet
Material: METHANOL
Weathers
Category 1.5/F 3.65e+00
Category 1.5/F 7.3e+004
Category 3/D 3.65e+004
Category 3/D 7.3e+004 p
Category 6/D 3.65e+004
Category 6/D 7.3e+004 p
Flash Fire Envelope
Distance Crosswind (m)
Distance Downwind (m)


Study Folder: Methanol Evaporator Leak at Outlet
Audit No: 466
Model: Evaporator Outlet
Material: METHANOL
Worst Cases @: 0.02068 bar
Weathers
Category 1.5/F Radius
Category 3/D Radius
Category 6/D Radius
Late Explosion Worst Case Radii
Distance Crosswind (m)
Distance Downwind (m)

Scenario 11: Release from Methanol Evaporator (E-2102) at outlet - Jet Fire

Parameters

Temperature - 120°C

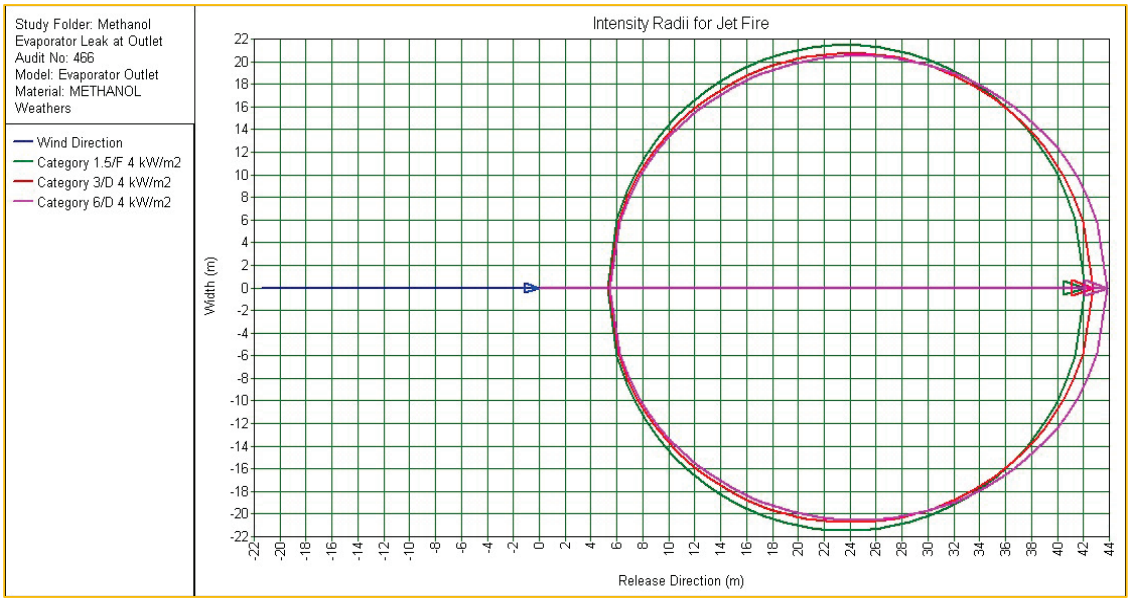
Pressure - 5.3 kg/ cm^2 G

Flow Rate - 1550 Nm^3/ hr

Heat Radiation Model

Flame Length - 33.67 m

Percent Lethality	Thermal Load (kW/m^2)	Effect Distance (m)		
		F (1.5 m/s)	D (3 m/s)	D (6 m/s)
First Degree Burns	4.0	42.0986	42.7365	43.845
1	9.33	35.2648	36.3289	38.3265
10	12.70	35.5422	33.5301	36.3156
50	18.47	30.5367	31.7895	33.9008
99	36.56	23.6311	22.9231	27.6089



Scenario 12: Release from Methanol Super heater (E-2104) at outlet - Flash Fire/ VCE

Parameters

Temperature - 220^0C

Pressure - 4 kg/ cm^2 G

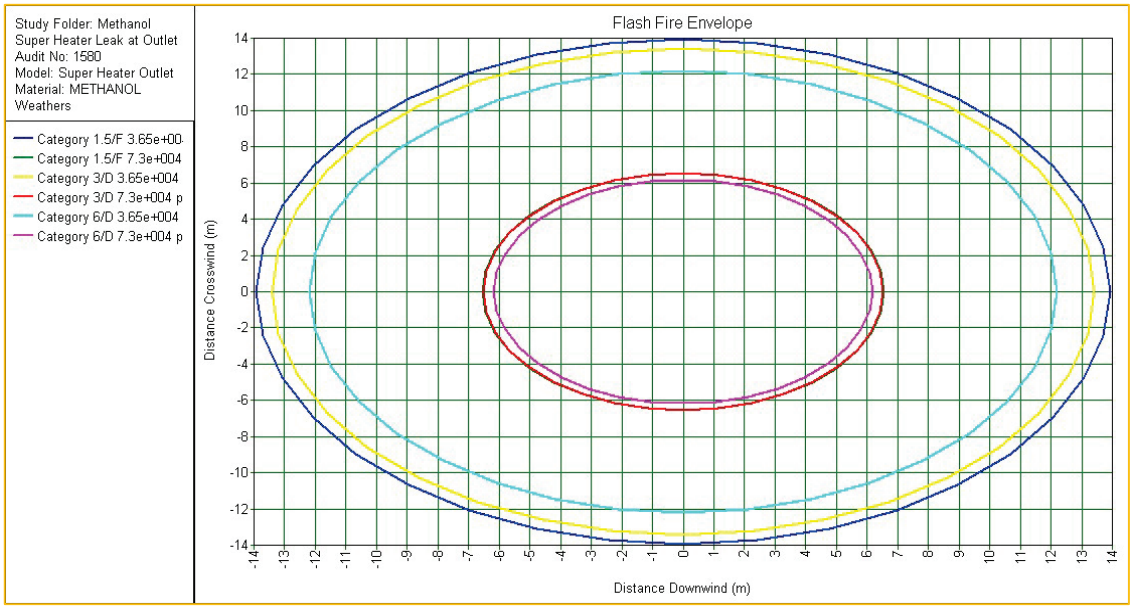
Flow Rate - 1550 Nm^3/ hr

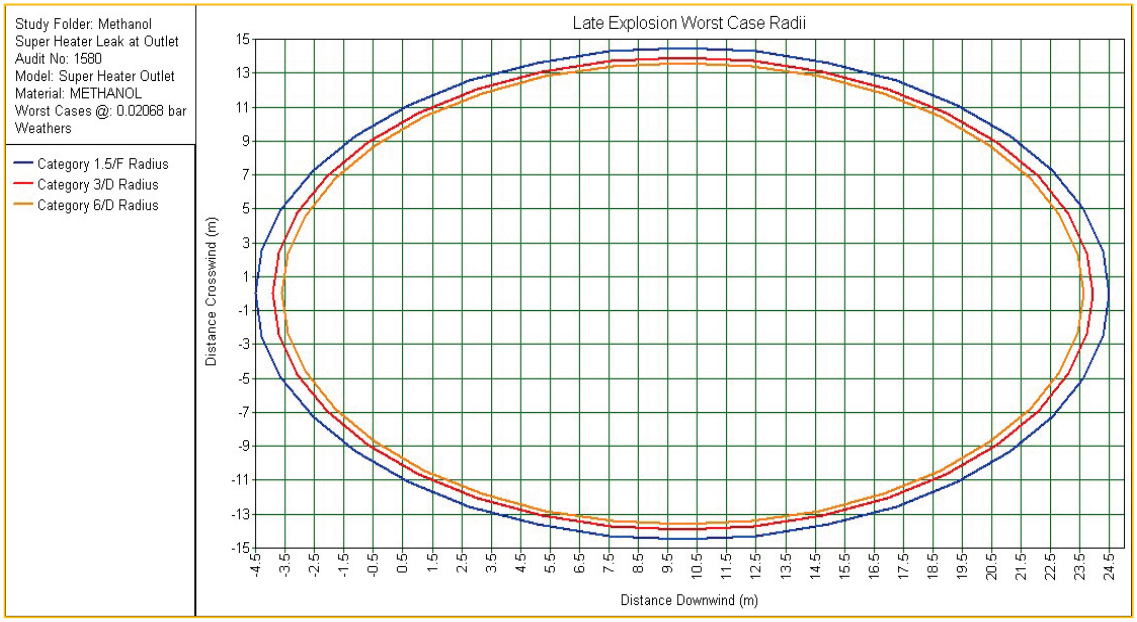
Flash Fire Model

Concentration (ppm)	Distance (m)		
	F (1.5 m/s)	D (3 m/s)	D (6 m/s)
36500	13.9293	13.4137	12.1919
73000	6.54686	6.53203	6.17302

Vapour Cloud Explosion Model

Over Pressure (bar)	Effect Distance (m)		
	F (1.5 m/s)	D (3 m/s)	D (6 m/s)
0.02068	24.4976	23.9296	23.6163
0.1379	13.7538	13.6067	13.5256
0.2068	12.9046	12.7908	12.728


Study Folder: Methanol
Super Heater Leak at Outlet
Audit No: 1580
Model: Super Heater Outlet
Material: METHANOL
Weathers
Category 1.5/F 3.65e+00
Category 1.5/F 7.3e+004
Category 3/D 3.65e+004
Category 3/D 7.3e+004 p
Category 6/D 3.65e+004
Category 6/D 7.3e+004 p
Flash Fire Envelope
Distance Crosswind (m)
Distance Downwind (m)


Study Folder: Methanol
Super Heater Leak at Outlet
Audit No: 1580
Model: Super Heater Outlet
Material: METHANOL
Worst Cases @: 0.02068 bar
Weathers
Category 1.5/F Radius
Category 3/D Radius
Category 6/D Radius
Late Explosion Worst Case Radii
Distance Crosswind (m)
Distance Downwind (m)

Scenario 13: Release from Methanol Super heater (E-2104) at outlet - Jet Fire

Parameters

Temperature - 220°C

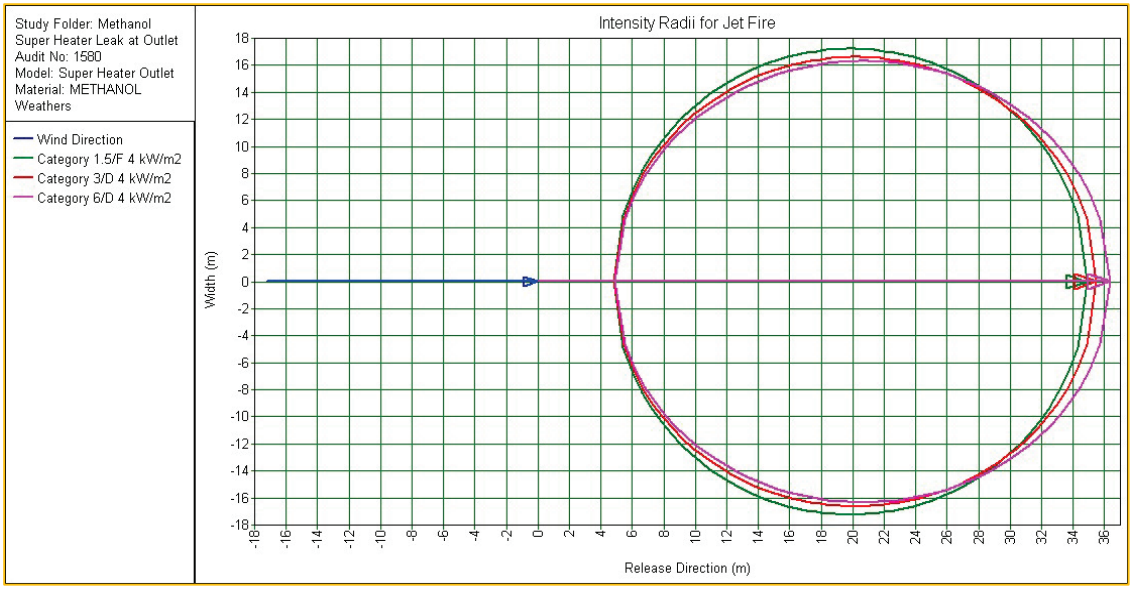
Pressure - 4 kg/ cm^2 G

Flow Rate - 1550 Nm^3/ hr

Heat Radiation Model

Flame Length - 28.44 m

Percent Lethality	Thermal Load (kW/m^2)	Effect Distance (m)		
		F (1.5 m/s)	D (3 m/s)	D (6 m/s)
First Degree Burns	4.0	34.8951	35.4786	36.3539
1	9.33	29.3498	30.2459	31.8544
10	12.70	26.9603	27.913	30.0503
50	18.47	25.555	26.6025	28.3391
99	36.56	17.6925	16.5275	19.4321



Scenario 14: Release from Methanol Inlet to Hydro Chlorination Reactor (R- 2101) - Flash Fire/ VCE

Parameters

Temperature - 220^0C

Pressure - 3.5 kg/ cm^2 G

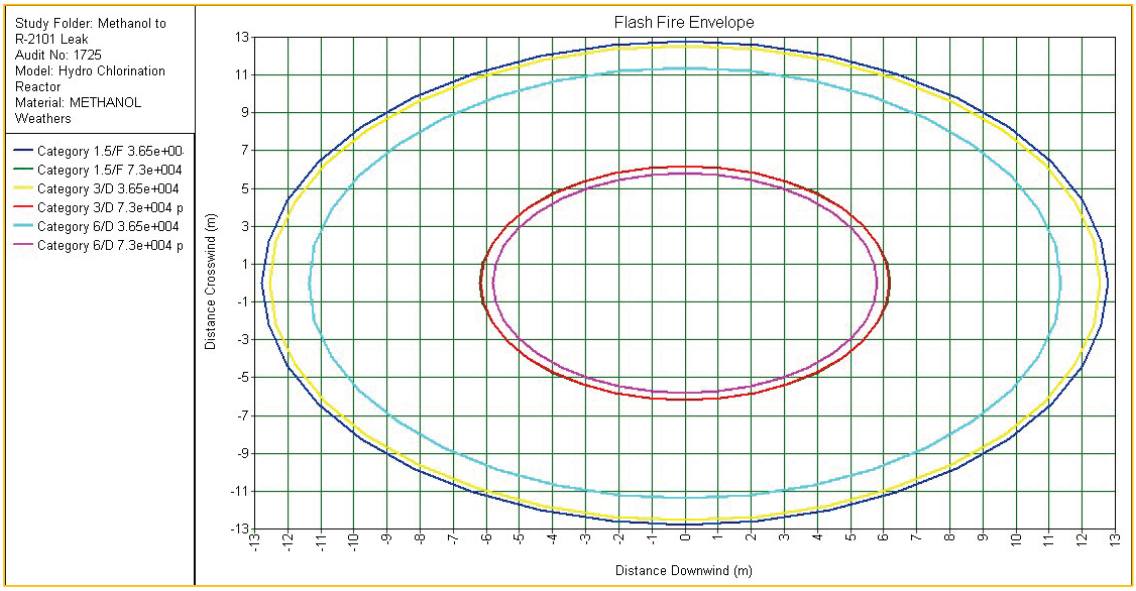
Flow Rate - 1550 Nm^3/ hr

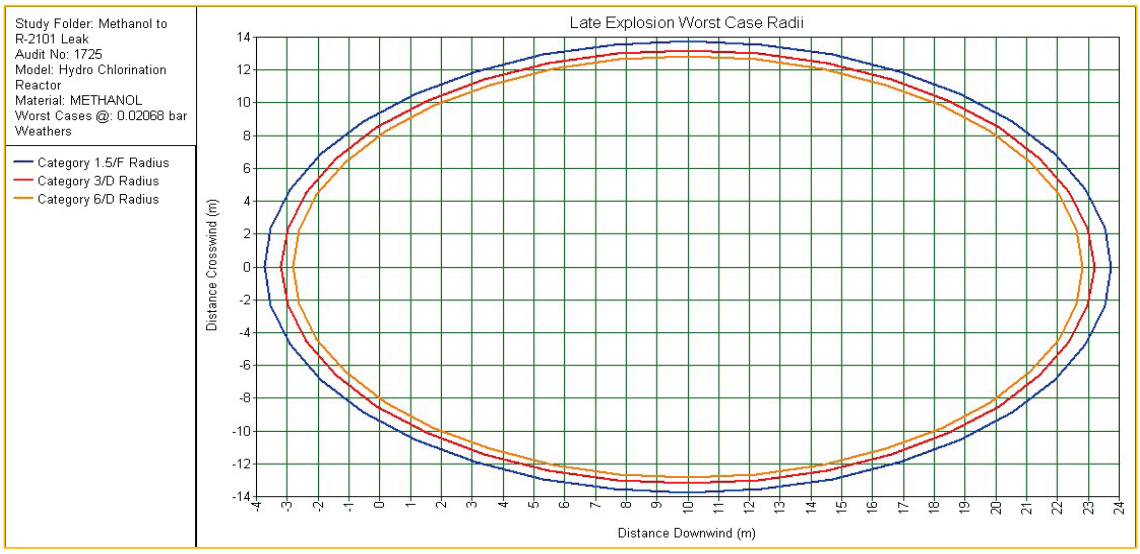
Flash Fire Model

Concentration (ppm)	Distance (m)		
	F (1.5 m/s)	D (3 m/s)	D (6 m/s)
36500	12.7817	12.5474	11.3687
73000	6.19307	6.18125	5.81428

Vapour Cloud Explosion Model

Over Pressure (bar)	Effect Distance (m)		
	F (1.5 m/s)	D (3 m/s)	D (6 m/s)
0.02068	23.7503	23.194	22.8232
0.1379	13.5603	13.4163	13.3202
0.2068	12.7549	12.6434	12.5691


Study Folder: Methanol to R-2101 Leak
Audit No: 1725
Model: Hydro Chlorination Reactor
Material: METHANOL
Weathers
Category 1.5/F 3.65e+00
Category 1.5/F 7.3e+004
Category 3/D 3.65e+004
Category 3/D 7.3e+004 p
Category 6/D 3.65e+004
Category 6/D 7.3e+004 p
Flash Fire Envelope
Distance Crosswind (m)
Distance Downwind (m)


Study Folder: Methanol to R-2101 Leak
Audit No: 1725
Model: Hydro Chlorination Reactor
Material: METHANOL
Worst Cases @: 0.02068 bar
Weathers
Category 1.5/F Radius
Category 3/D Radius
Category 6/D Radius
Late Explosion Worst Case Radii
Distance Crosswind (m)
Distance Downwind (m)

Scenario 15: Release from Methanol Inlet to Hydro Chlorination Reactor (R- 2101) - Jet Fire

Parameters

Temperature - 220°C

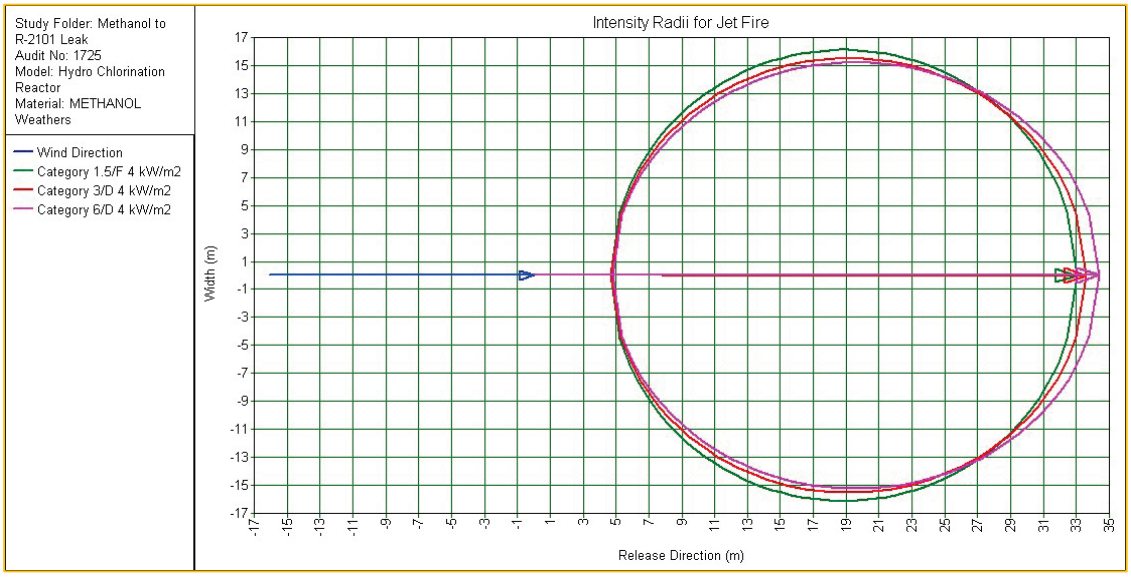
Pressure - 3.5 kg/ cm^2 G

Flow Rate - 1550 Nm^3/ hr

Heat Radiation Model

Flame Length - 27.07 m

Percent Lethality	Thermal Load (kW/m^2)	Effect Distance (m)		
		F (1.5 m/s)	D (3 m/s)	D (6 m/s)
First Degree Burns	4.0	33.0169	33.5821	34.3953
1	9.33	27.7922	28.6407	30.1547
10	12.70	25.56	26.4695	28.3591
50	18.47	24.2403	Not Reached	26.8657
99	36.56	15.951	Not Reached	17.0144



RELEASE CONSEQUENCE CALCULATIONS – SUMMARY

Sr. No.	Scenario Description	Damage Distance	
		50% fatality	1%fatality
CHLOR - ALKALI PLANT			
1.	Release from Chlorine Buffer Vessel- Toxic		325
2.	Release H_2 gas from Electrolyser outlet - VCE	26.0414	27.8077
3.	Release of H_2 gas from Electrolyser outlet – Jet Fire	10.1482	11.6294
4.	Release from H_2 Gas line to Caustic Flaking Plant - VCE	26.442	28.3254
5.	Release from H_2 Gas line to Caustic Flaking Plant – Jet Fire	10.8691	12.2181
CHLOROMETHANES PLANT			
6.	Release from Methanol Unloading Arm - VCE	48.9158	51.5225
7.	Release from Methanol Unloading Arm – Pool Fire	33.9684	40.8154
8.	Release from Methanol Daily Tank (V-2101 C) Failure - VCE	132.489	168.3
9.	Release from Methanol Daily Tank (V-2101 C) Failure - Pool Fire	31.8345	39.4857
10.	Release from Methanol Evaporator (E-2102) at outlet - VCE	13.4426	14.4491
11.	Release from Methanol Evaporator (E-2102) at outlet - Jet Fire	33.9008	38.3265
12.	Release from Methanol Super heater (E-2104) at outlet - VCE	12.9046	13.7538
13.	Release from Methanol Super heater (E-2104) at outlet - Jet Fire	28.3391	31.8544
14.	Release from Methanol Inlet to Hydro Chlorination Reactor (R- 2101) - VCE	12.7549	13.5603
15.	Release from Methanol Inlet to Hydro Chlorination Reactor (R- 2101) - Jet Fire	24.2403	30.1547

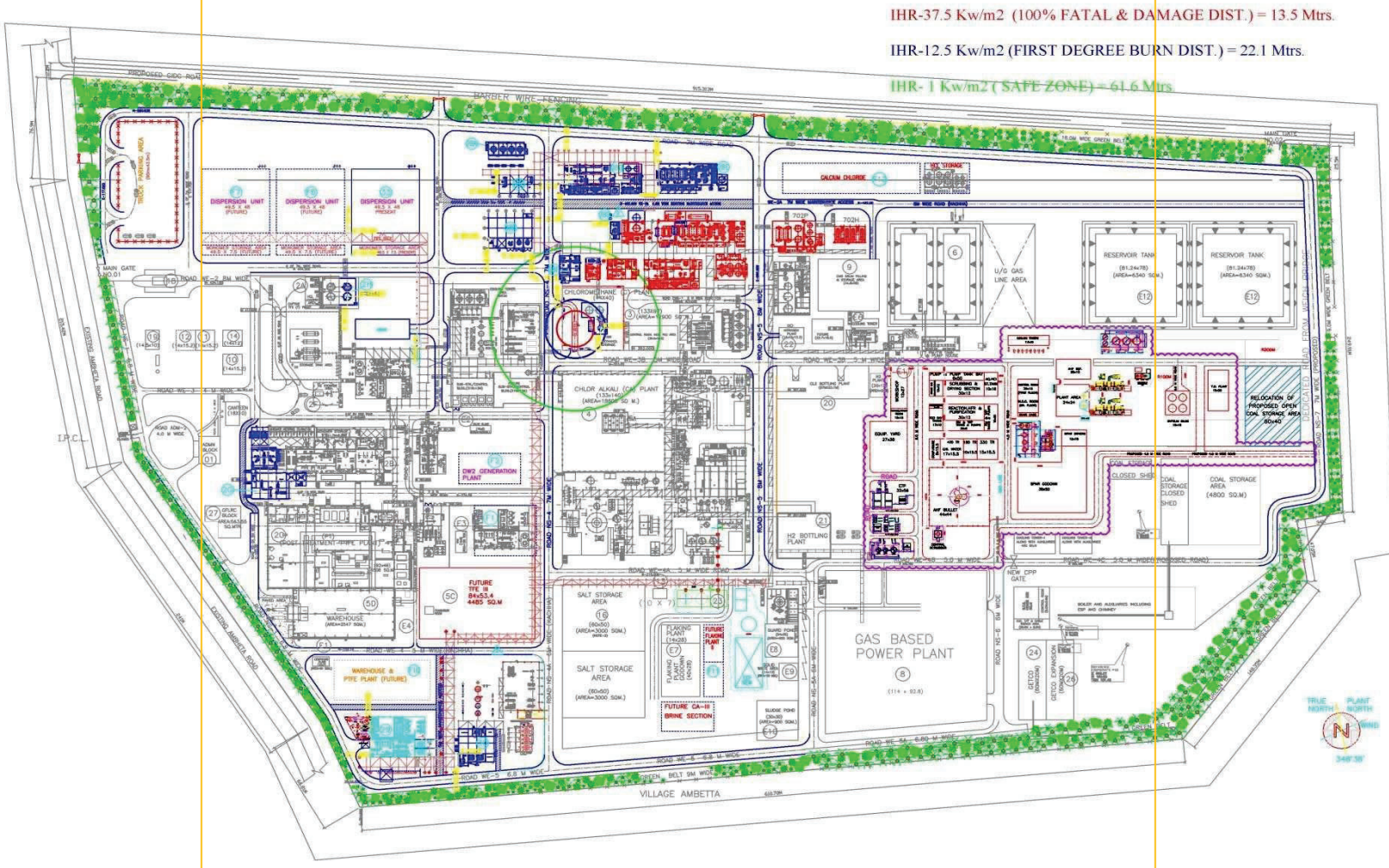
Scenario –1 Pool Fire for Methanol road tanker catastrophic failure

TABLE – A For Methanol road tanker.			
Scenario : UNCONFINED POOL FIRE			
In put Data		Results of Computations	
Stored quantity	20 KL	Max. IHR at flame center height	180 Kw/m^2
Pool diameter	25(m)	Flame center height	9.6 meter
Pool liquid depth	0.1 (m)	Maximum Flame width	9.59 meter
Wind speed	6 m/s	Mass burning rate liquid	1.34 kg/ m^2/min.
Liquid Density	791 kg/m^3	Flame burnout time	58.82 Mims.
Incident Intensity of Heat Radiation (IHR) at ground level KW /m^2	IHR- Isopleth Distance (Meters)	Effect if IHR at Height of Simulation	
37.5	13.5	Damage to process equipment. 100 % Fatal in 1 Min. 1 % fatal in 10 sec.	
25.0	15.6	Min. to ignite wood (without flame contact). 100 % fatal in 1 Min. Significant injury in 10 sec.	
12.5	22.1	Min. to ignite wood (with flame contact). 1 % fatal in 1 min. 1 st deg. burn in 10 sec.	
4.0	39.0	Pain after 20 secs. Blistering unlikely.	
1.6	61.6	No discomfort even on long exposure.	

Results

- In the 13.5 meter radius area is considered as 100% fatality in 1 min.
- In the 22.1 meter radius first degree burn in 10 sec.
- In the 39 meter radius area will give pain after 20 seconds. Blistering unlikely.
- In the 61.6 meter radius area is considered as safe area and no discomfiture even on long exposure.

Scenario -1 Pool Fire for Methanol road tanker catastrophic failure



Scenario –2 Tank on Fire for Methanol storage tank catastrophic failure

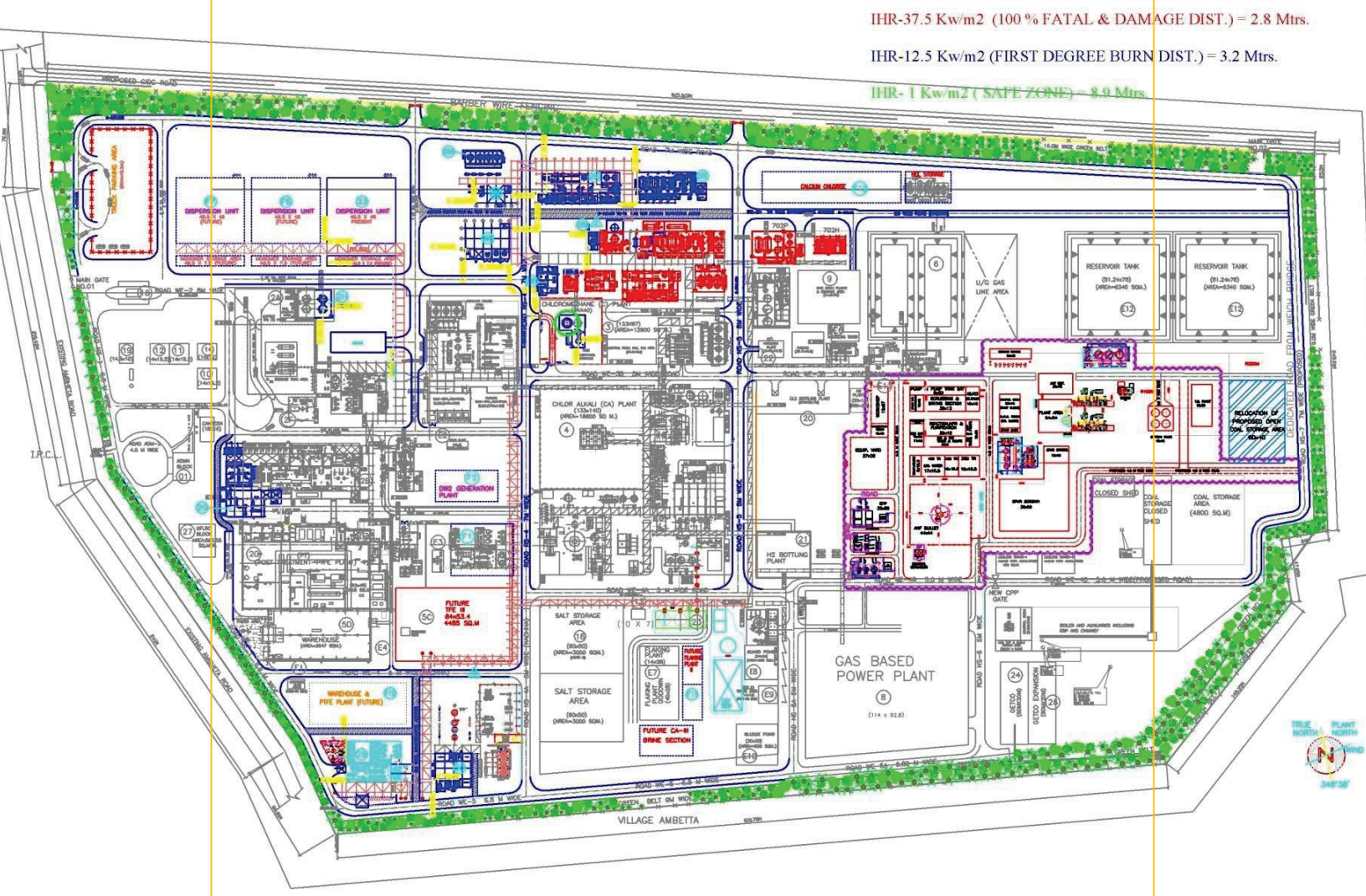
TABLE –B Tank on Fire Simulation for Methanol tank.			
Scenario : TANK ON FIRE			
In put Data		Results of Computations	
Stored quantity	150 KL.	Max. IHR at flame center height	23.0631 Kw/m^2
Pool diameter	3.8(m)	Flame center height	6.66 meter
Pool liquid depth	5.0 (m)	Maximum Flame width	2.66 meter
Wind speed	6 m/s	Mass burning rate liquid	1.3 kg/m^2/min.
Liquid Density	791.7 kg/m^3	Flame burnout time	39 Hrs.

Incident Intensity of Heat Radiation (IHR) at ground level KW /m^2	IHR-Isopleth Distance (Meters)	Effect if IHR at Height of Simulation
37.5	2.8	Damage to process equipment. 100 % Fatal in 1 Min. 1 % fatal in 10 sec.
25.0	3.0	Min. to ignite wood (without flame contact). 100 % fatal in 1 Min. Significant injury in 10 sec.
12.5	3.2	Min. to ignite wood (with flame contact). 1% fatal in 1 min. 1 st deg. burn in 10 sec.
4.0	5.8	Pain after 20 secs. Blistering unlikely.
1.6	8.9	No discomfort even on long exposure.

Results

- In the 2.8 meter radius area is considered as 1% fatality in 1 min.
- In the 3.2 meter radius area is considered as first degree burn in 10 sec.
- In the 5.8 meter radius area will give pain after 20 seconds. Blistering unlikely.
- In the 8.9 meter radius area is considered as safe area and no discomfiture even on long exposure.

Scenario -2 Tank on Fire for Methanol storage tank catastrophic failure



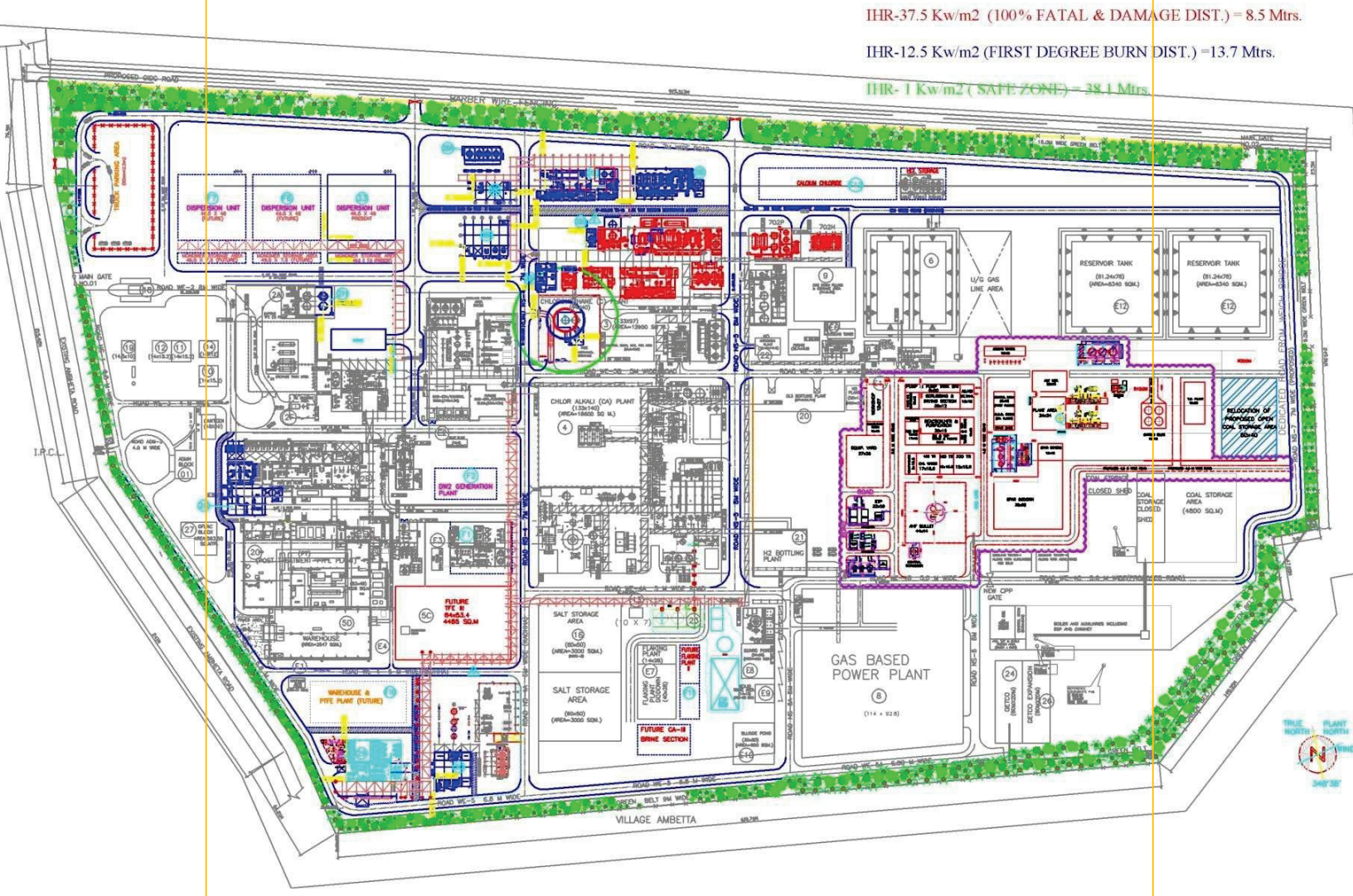
Scenario –3 Pool Fire for Methanol storage tank catastrophic failure

TABLE –C			
Pool Fire Simulation for Methanol tank.			
Scenario : POOL FIRE			
In put Data		Results of Computations	
Stored quantity	150 KL.	Max. IHR at flame centre height	122.07 Kw/m^2
Pool diameter	18.5 (m)	Flame centre height	7.71 meter
Pool liquid depth	1.0 (m)	Maximum Flame width	6.71 meter
Wind speed	6 m/s	Mass burning rate liquid	1.34 kg/ m^2/min.
Liquid Density	791.7 kg/m^3	Flame burnout time	9.8 Hrs.
Incident Intensity of Heat Radiation (IHR) at ground level KW	IHR-Isopleth Distance (Meters)	Effect if IHR at Height of Simulation	
37.5	8.5	Damage to process equipment. 100 % Fatal in 1 Min. 1 % fatal in 10 sec.	
25	9.7	Min. to ignite wood (without flame contact). 100 % fatal in 1 Min. Significant injury in 10 sec.	
12.5	13.7	Min. to ignite wood (with flame contact). 1 % fatal in 1min. 1 st deg. burn in 10 sec.	
4	24.1	Pain after 20 secs. Blistering unlikely.	
1.6	38.1	No discomfort even on long exposure.	

Results

- In the 8.5 meter radius area is considered as 100% fatality in 1 min.
- In the 13.7 meter radius first degree burn in 10 sec.
- In the 24.1 meter radius area will give pain after 20 seconds. Blistering unlikely.
- In the 38.1 meter radius area is considered as safe area and no discomfiture even on long exposure.

Scenario -3 Pool Fire for Methanol storage tank catastrophic failure



EVAPOURATION RATE CALCULATION DATA :

Material Name	Total capacity of storage (M^3)	Maximum Spillage (M^3)	Evaporation Rate (Kg/Sec.) ER-1	Explosive Mass (15 % of ER-2)	
				Kg	Lbm
Methanol	150	150	0.300	270	596
Methylene Dichloride	150	150	2326 Gms/ Sec.	-	-
Chloroform	100	100	427 gms/sec	-	-
Carbon tetrachloride	100	100	1152 Gms/ Sec	-	-
Oleum	100	100	2405 Gms/sec	-	-
AHF	25	25	1320 Gms/sec	-	-

Scenario –4 Fire Ball simulation for Methanol storage tank catastrophic failure

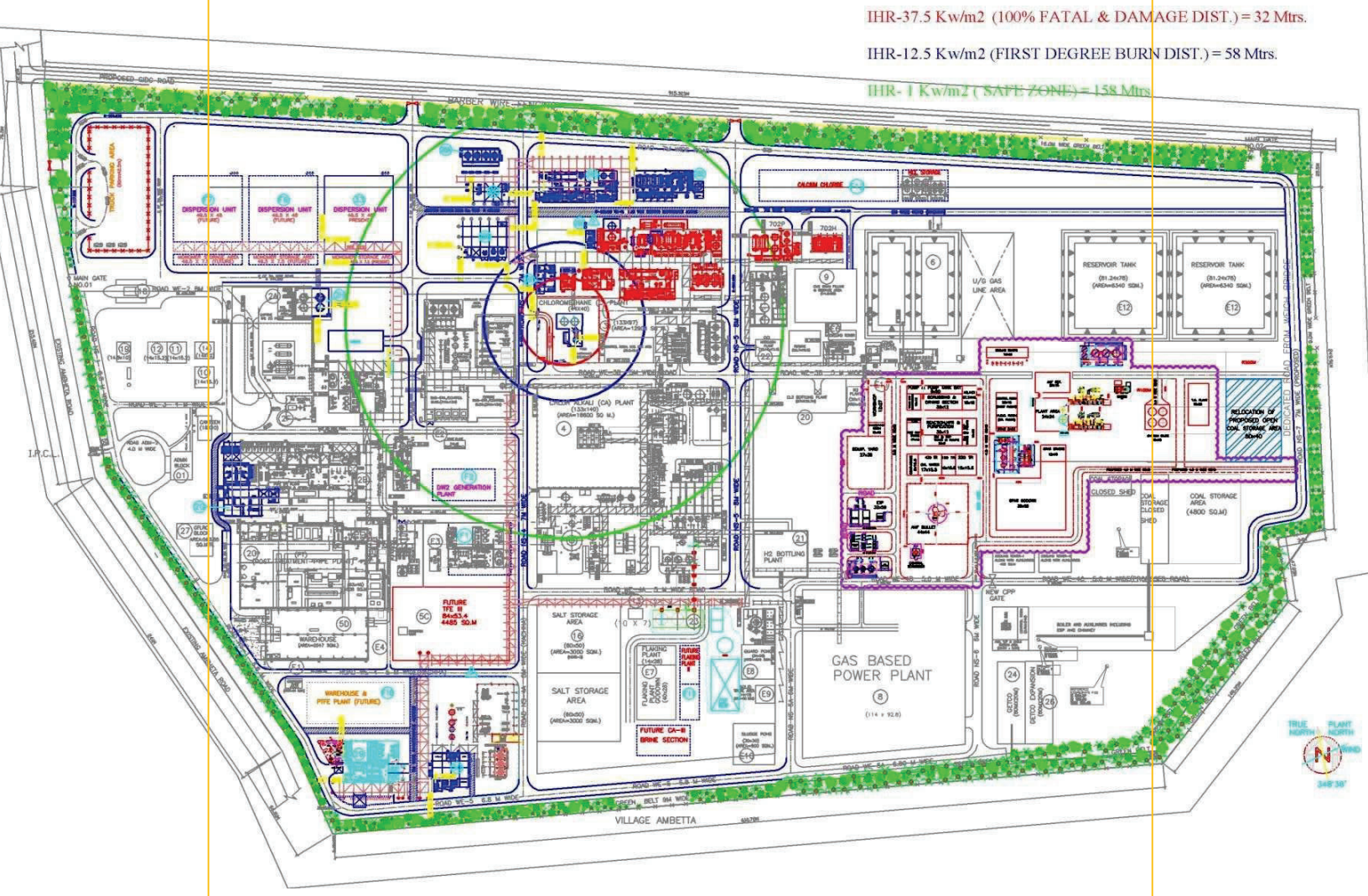
TABLE –D For Methanol storage tank			
Scenario	FIRE BALL		
In put Data		Results of Computations	
Stored quantity	150 KL	Fire Ball radius	16.62 meter
Mass of vapour Between LEL-UEL%	270 Kgs.	Fire ball radiation Intensity of Heat	144.82 Kw /m ^{2}
Heat of combustion	19580 Kj/Kg	Fire Ball rate of energy release	502989 Kj/ sec.
Wind speed	6 m/s	Fire- Ball total energy release	3.41352e+006 Kj
Liquid Density	791 kg/m^3	Fire ball duration	6.7 sec.

Incident Intensity of Heat Radiation (IHR) at ground level KW/m ^{2}	IHR-Isopleth Distance (Meters)	Damage effects
37.5	32	100 % Fatal Min. to ignite wood (without flame contact)
25.0	40	Min. to ignite wood (without flame contact). Significant injury.
12.5	58	Min. to ignite wood (with flame contact). 1 st deg. burn .
4.0	100	Pain after 20 secs. Blistering unlikely.
1.6	158	No discomfort even on long exposure.

Results

- In the 32 meter radius area is considered as 100 % fatality in 1 min
- In the 58 meter radius first degree burn in 10 sec.
- In the 100 meter radius area will give pain after 20 seconds. Blistering unlikely.
- In the 158 meter radius area is considered as safe area and no discomfiture even on long exposure.

Scenario -4 Fire Ball simulation for Methanol storage tank catastrophic failure



Scenario –5 Flash Fire simulation for Methanol storage tank catastrophic failure

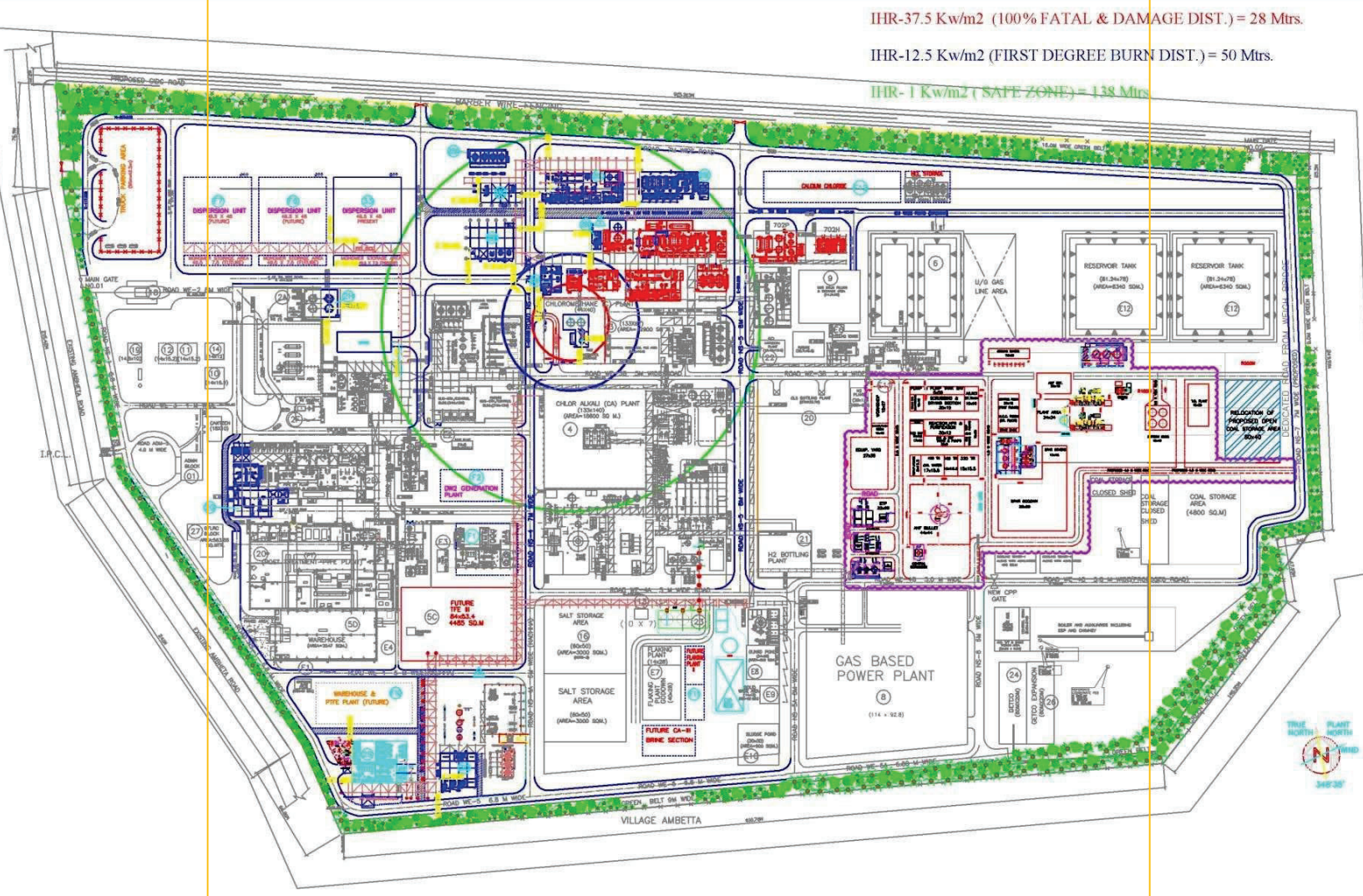
TABLE –E For Methanol storage tank			
Scenario : FLASH FIRE			
In put Data		Results of Computations	
Stored quantity	150 KL	Visible Flash Fire Height	69.57 meter
Mass of Gas	270 Kgs.	Visible Flash Fire Width	34.78 meter
Heat of combustion	19580 KJ/kg	Duration of Flash-Fire in Sec.	6.79 Sec.
Fuel-Air volume ratio in Flash fire cloud	16.62	Radius of fuel-air cloud mixture	16.62 meter
Stochiometric Fuel-Air Mixture	0.33	Total energy release	2643300 KJ
Wind speed	6.0 m/s	Max. Heat Radiation from 1 m from Flash Fire	112.15 Kw/M^2
Gas Density	1.31 kg/m^3	Combustion efficiency	0.5

Incident Intensity of Heat Radiation (IHR) at ground level KW/m^2	IHR-Isopleth Distance (Meters)	Damage effects
37.5	28	100 % Fatal . Min. to ignite wood (without flame contact)
25.0	32	Significant injury. Min. to ignite wood (without flame contact).
12.5	50	Min. to ignite wood (with flame contact). 1st deg. burn
4.0	88	Pain after 20 secs. Blistering unlikely.
1.6	138	No discomfort even on long exposure.

Results

- In the 28 meter radius area is considered as 100 % fatality in 1 min
- In the 50 meter radius first degree burn in 10 sec.
- In the 88 meter radius area will give pain after 20 seconds. Blistering unlikely.
- In the 138 meter radius area is considered as safe area and no discomfiture even on long exposure.

Scenario -5 Flash Fire simulation for Methanol storage tank catastrophic failure



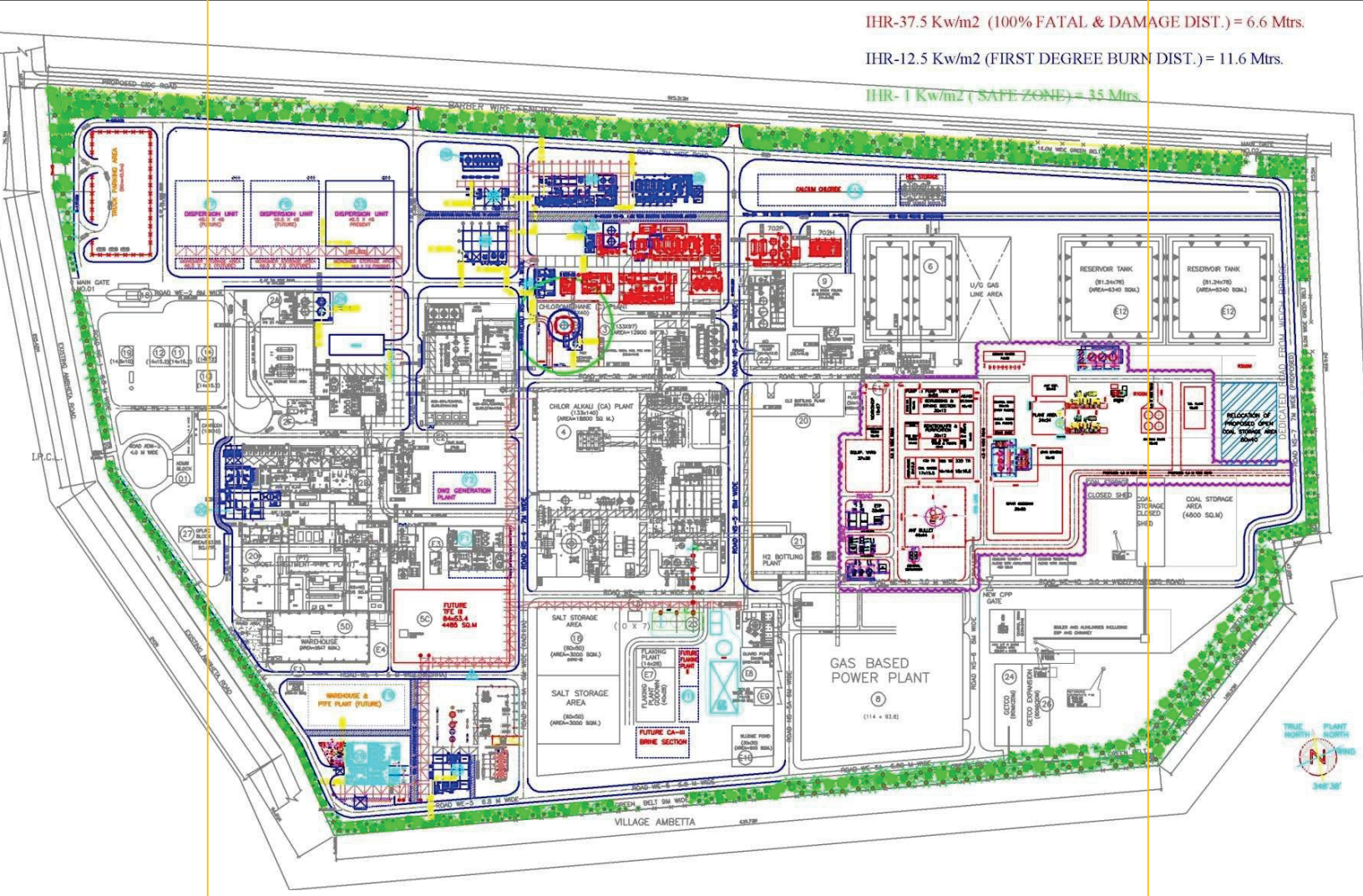
Scenario –6 Unconfined Vapour cloud Explosion (UVCE) for Methanol storage tank catastrophic failure

TABLE –F For Methanol storage tank					
Scenario : UVCE					
In put Data					
Stored quantity		150 KL			
Mass of vapour between LEL – UEL %		596 lbm.			
TNT equivalent		4.2			
Explosion efficiency		0.04			
Wind speed		6.0 m/s			
Radial Distance in feet	Over pressure (psi)	% Fatality lung Rupture	% Eardrum rupture	%Structural damage	% Glass rupture
20	39.7	100	100	100	100
25	23.3	98.8	100	100	100
35	10.4	0.0	78. 7	100	100
105	2.1	0.0	2.6	10.9	100
2205	0.3	0.0	0.0	0.0	3.2

Results

- In case of UVCE up to 20 feet distance is considered as 100 % fatality and 100 % ear drum rupture radius.
- Up to 35 feet distance is considered as 100 % structural Damage and up to 105 feet distance for 100 % glass damage area.

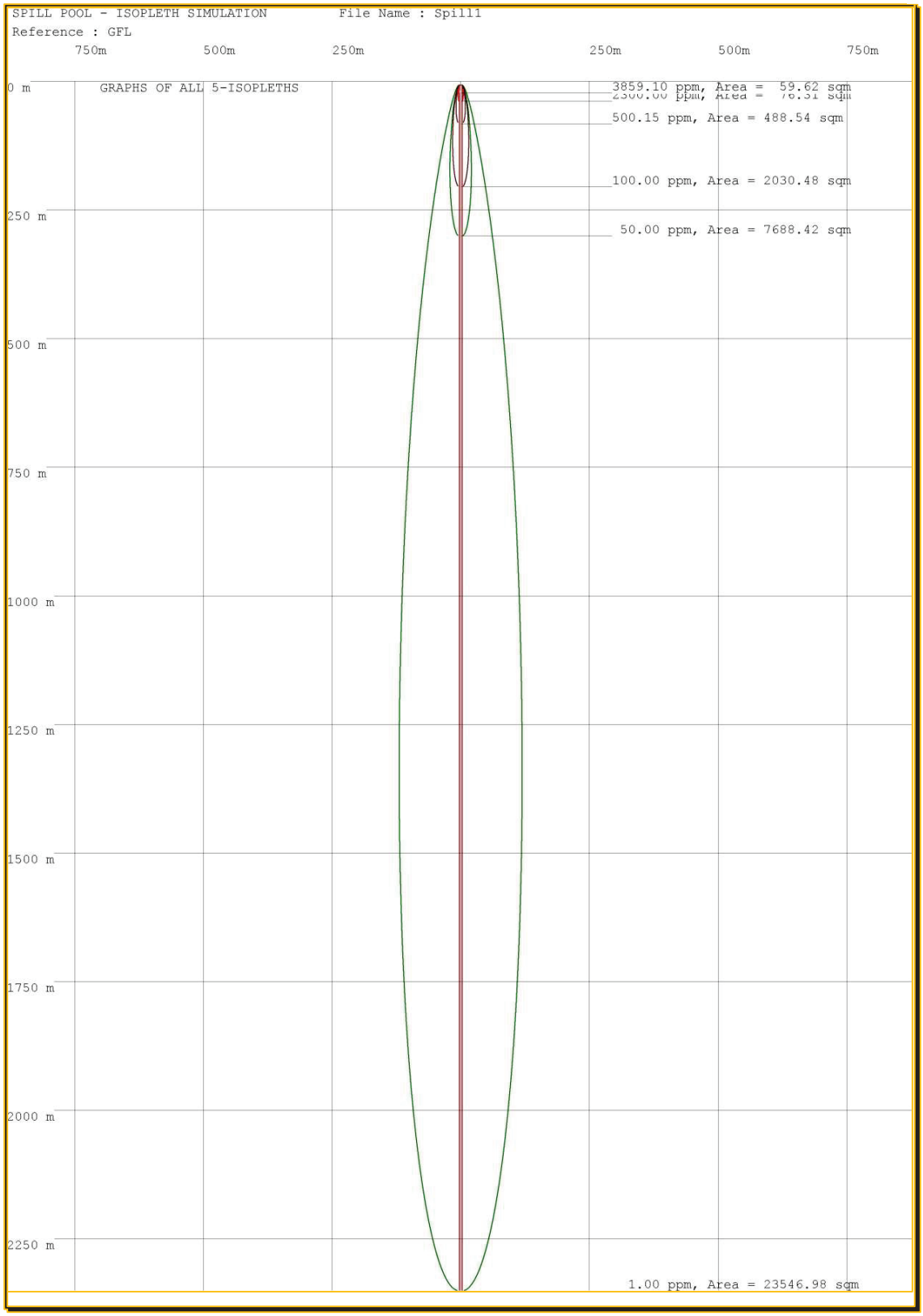
Scenario -6 Unconfined Vapour cloud Explosion (UVCE) for Methanol storage tank catastrophic failure



Scenario –7 Spill Pool Evaporation for Methylene Dichloride tank Catastrophic Failure

TABLE –G Spill Pool Evaporation for Methylene Dichloride Storage tank			
Scenario : SPILL POOL/ PLUME RELEASE			
Input Data		Results of Computations	
Stored quantity	100 KL	Begin Point (meter)	End point (meter)
Evaporation Rate	2326 Gms/ Sec.		
IDLH value	2300 ppm	13.6 9	38.88
TLV value	50 ppm	8.72	300.63

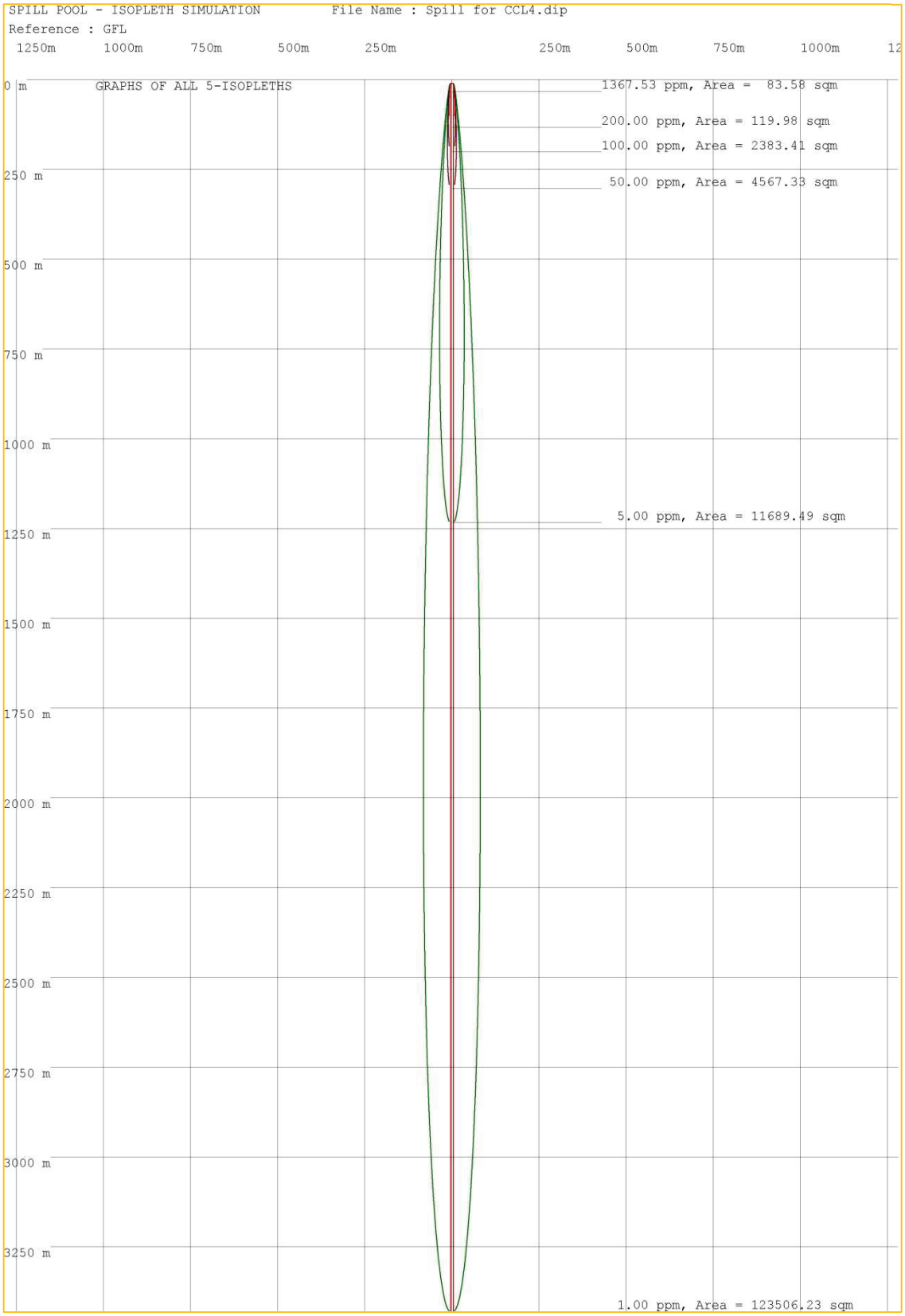
- IDLH (Immediate danger to life and health) concentration area up to 38 meter and TWA (50 PPM) area up to 300 meter. Therefore 38 meter area in wind direction is considered as evacuation area.


SPILL POOL - ISOPLETH SIMULATION
File Name : Spill1
Reference : GFL
750m
500m
250m
250m
500m
750m
0 m
GRAPHS OF ALL 5-ISOPLETHS
3859.10 ppm, Area = 59.62 sqm
2500.00 ppm, Area = 78.51 sqm
500.15 ppm, Area = 488.54 sqm
100.00 ppm, Area = 2030.48 sqm
50.00 ppm, Area = 7688.42 sqm
250 m
500 m
750 m
1000 m
1250 m
1500 m
1750 m
2000 m
2250 m
1.00 ppm, Area = 23546.98 sqm

Scenario –8 Spill Pool Evaporation for Carbon Tetrachloride tank Catastrophic Failure

TABLE – H Spill Pool Evaporation for Carbon Tetrachloride Storage tank		
Scenario :	SPILL POOL/ PLUME RELEASE	
In put Data		Results of Computations
Stored quantity	100 KL	End point (meter)
Evaporation Rate	1152 gms/ Sec.	
IDLH value	200 ppm	133.27
TLV value	5 ppm	1233.99

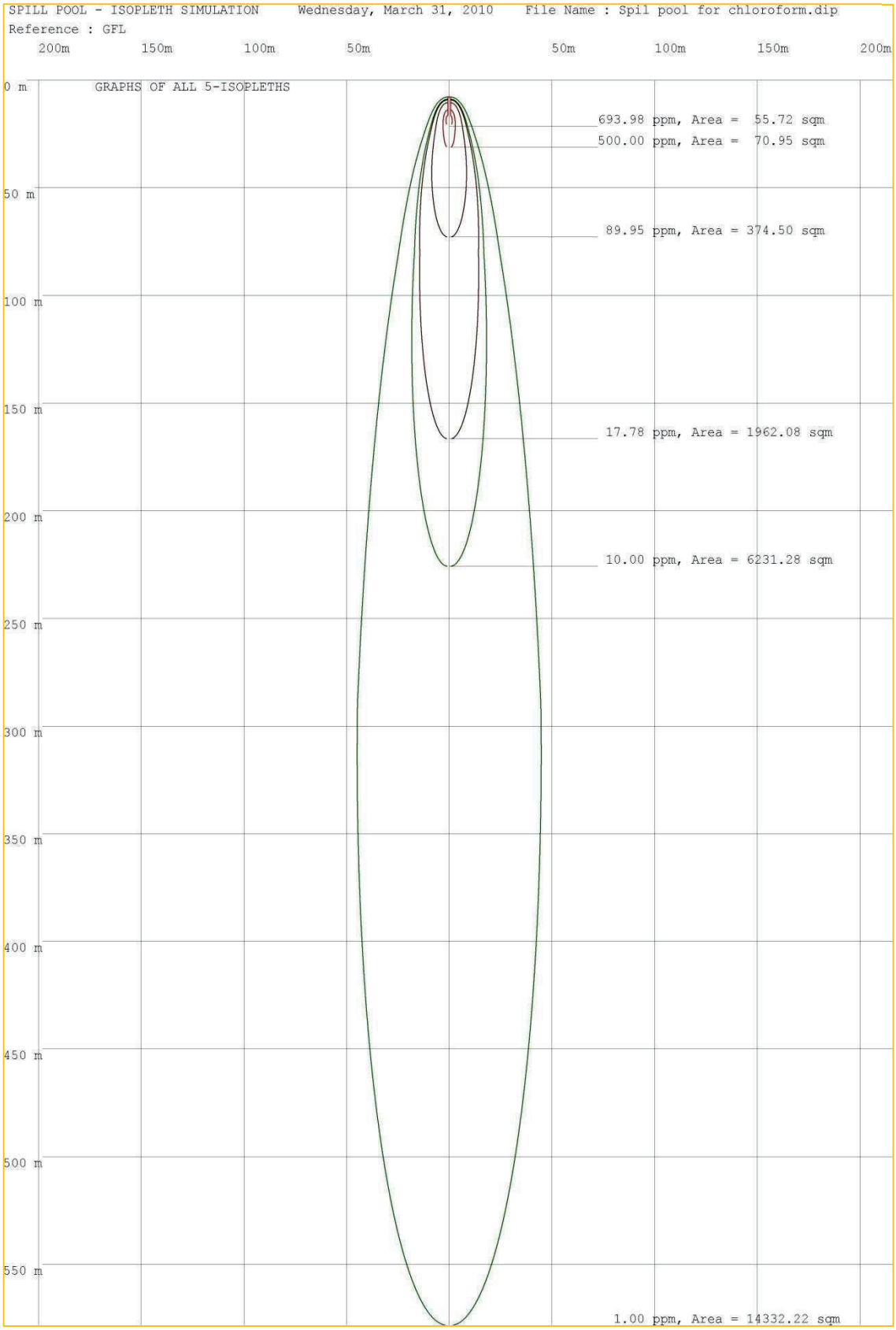
- IDLH (Immediate danger to life and health) concentration area up to 133 meter and TWA (5 PPM) area up to 1233 meter. Therefore 133 meter area in wind direction is considered as evacuation area.


SPILL POOL - ISOPLETH SIMULATION
File Name : Spill for CCL4.dip
Reference : GFL
1250m 1000m 750m 500m 250m 250m 500m 750m 1000m 12
0 m
GRAPHS OF ALL 5-ISOPLETHS
1367.53 ppm, Area = 83.58 sqm
200.00 ppm, Area = 119.98 sqm
100.00 ppm, Area = 2383.41 sqm
50.00 ppm, Area = 4567.33 sqm
5.00 ppm, Area = 11689.49 sqm
1.00 ppm, Area = 123506.23 sqm
250 m
500 m
750 m
1000 m
1250 m
1500 m
1750 m
2000 m
2250 m
2500 m
2750 m
3000 m
3250 m

Scenario – 9 Spill Pool Evaporation For Chloroform tank Catastrophic Failure

TABLE – I Spill Pool Evaporation For Chloroform tank Catastrophic Failure		
Scenario : SPILL POOL / PUFF RELEASE		
In put Data		Results of Computations
Stored quantity	100 KL	End point (meter)
Evaporation Rate	427 gms/sec.	
IDLH value	500 ppm	31.16
TLV value	10 ppm	225.71

- IDLH (Immediate danger to life and health) concentration area up to 31 meter, TWA (10 PPM) area up to 225 meter and. Therefore 31 meter area in wind direction is considered as evacuation area.

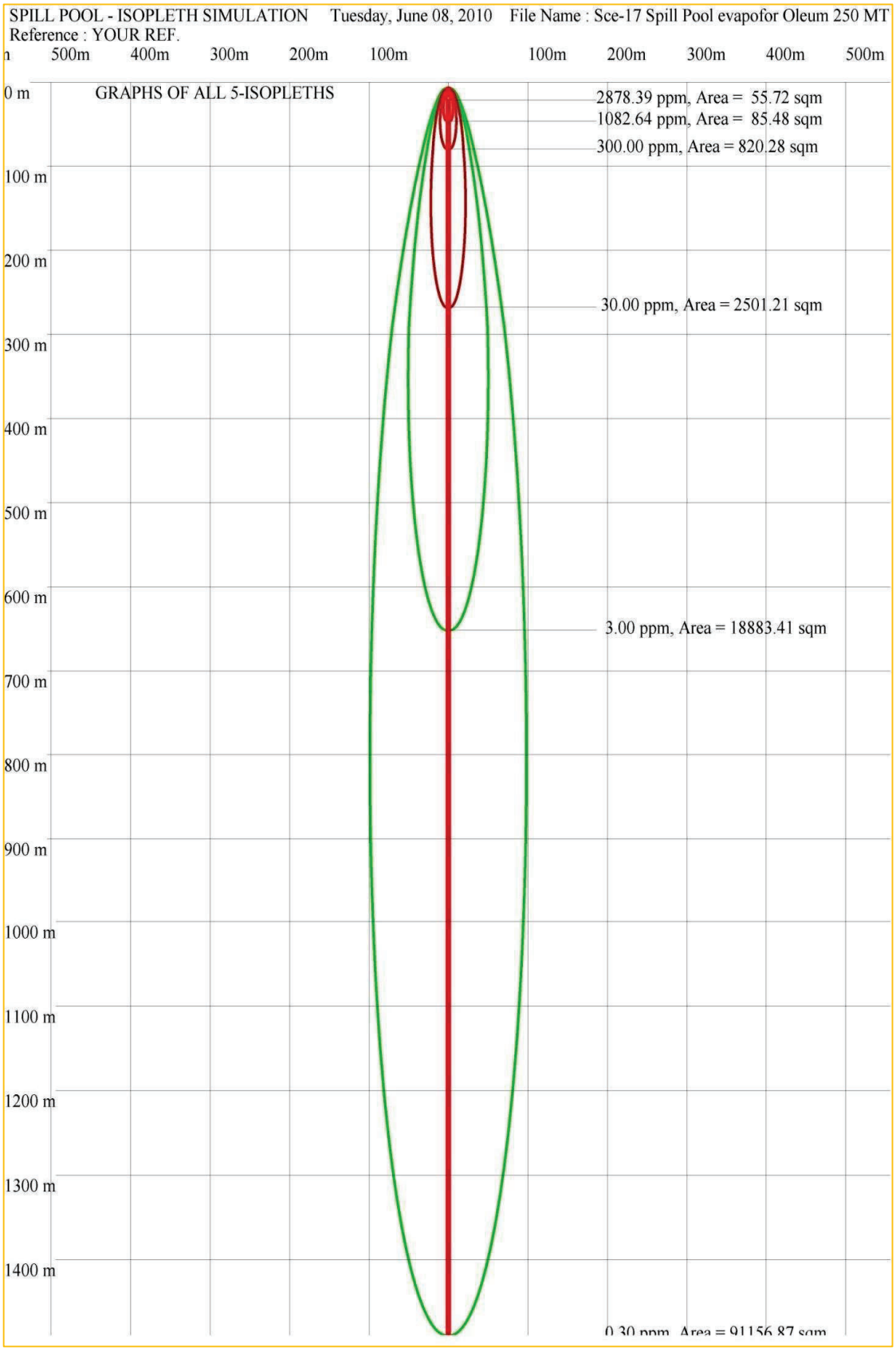

SPILL POOL - ISOPLETH SIMULATION Wednesday, March 31, 2010 File Name : Spil pool for chloroform.dip
Reference : GFL
200m 150m 100m 50m 50m 100m 150m 200m
GRAPHS OF ALL 5-ISOPLETHS
0 m
50 m
100 m
150 m
200 m
250 m
300 m
350 m
400 m
450 m
500 m
550 m
693.98 ppm, Area = 55.72 sqm
500.00 ppm, Area = 70.95 sqm
89.95 ppm, Area = 374.50 sqm
17.78 ppm, Area = 1962.08 sqm
10.00 ppm, Area = 6231.28 sqm
1.00 ppm, Area = 14332.22 sqm

Scenario – 10 Spill Pool evaporation module for Oleum 100 MT Tank catastrophic failure

TABLE – J Spill Pool evaporation module for Oleum 250 MT Tank catastrophic failure		
Scenario : SPILL POOL		
In put Data		Results of Computations
Stored quantity	100 MT	End point (meter)
Release Rate	2405 Gms/ Sec.(As SO_3)	
LC50 Human	460 ppm (1460 mg.m^3)	96.26
IDLH value	3.0 ppm (15 mg/m^3)	872.05
TLV value	0.30 ppm (1 mg/m^3)	1967.21

Results

- LC_{50} HUMAN (460 ppm) area up to 96.26 meter, Immediate danger to life and health (3ppm) concentration area up to 872.05 meter and TWA (0.30 PPM) area up to 1967.21 meter. Therefore 267.76 meter area in wind direction is considered as evacuation area.

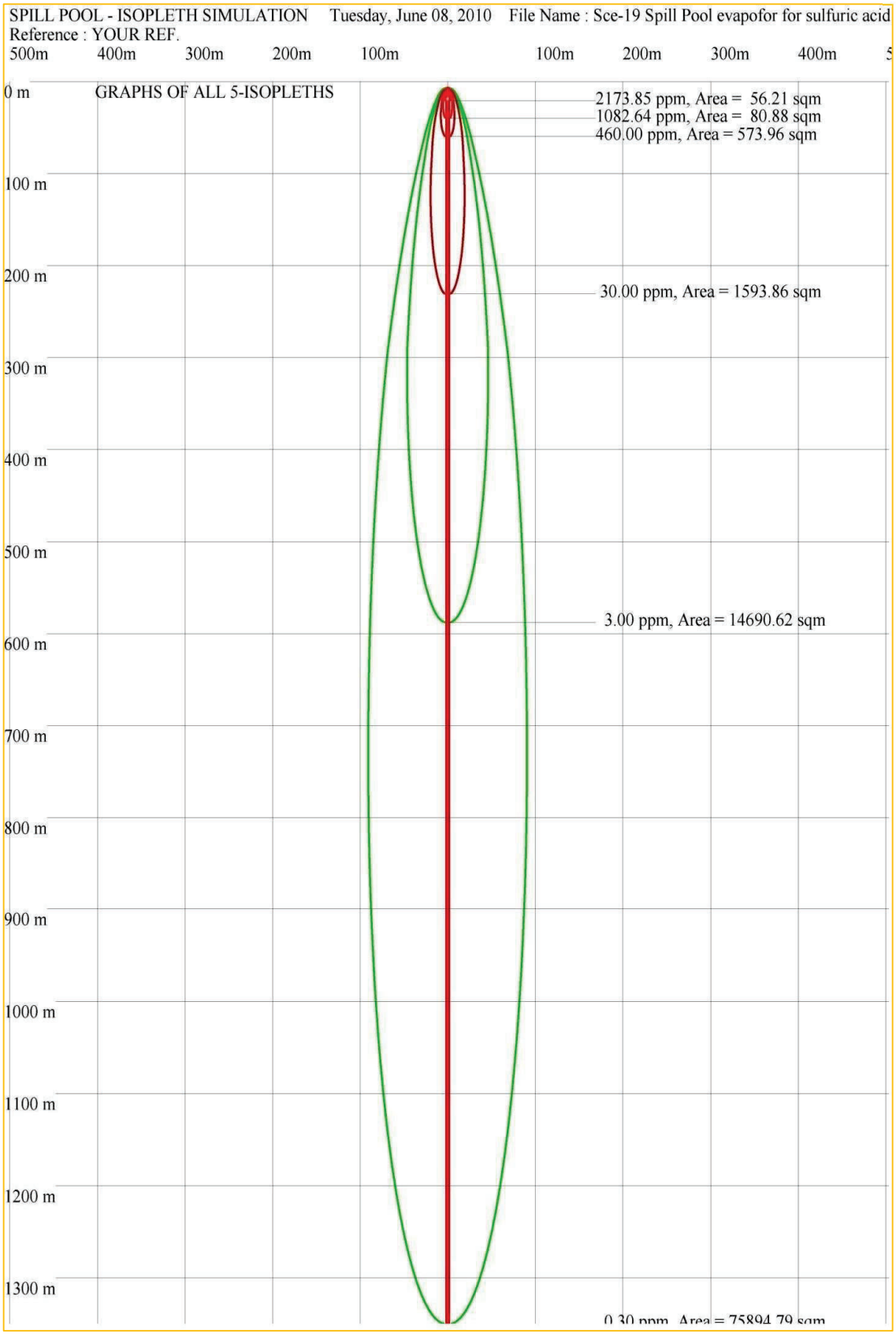

SPILL POOL - ISOPLETH SIMULATION Tuesday, June 08, 2010 File Name : Sce-17 Spill Pool evapofor Oleum 250 MT
Reference : YOUR REF.
500m 400m 300m 200m 100m 100m 200m 300m 400m 500m
GRAPHS OF ALL 5-ISOPLETHS
2878.39 ppm, Area = 55.72 sqm
1082.64 ppm, Area = 85.48 sqm
300.00 ppm, Area = 820.28 sqm
30.00 ppm, Area = 2501.21 sqm
3.00 ppm, Area = 18883.41 sqm
0.30 ppm, Area = 91156.87 sqm
0 m
100 m
200 m
300 m
400 m
500 m
600 m
700 m
800 m
900 m
1000 m
1100 m
1200 m
1300 m
1400 m

Scenario – 11 Spill Pool evaporation module for Sulphuric Acid Storage Tank catastrophic failure

TABLE – K Spill Pool evaporation module for Sulphuric Acid Storage Tank catastrophic failure		
Scenario : SPILL POOL		
Input Data		Results of Computations
Stored quantity	100 MT	End point (meter)
Release Rate	1000 Gms/ Sec. (As SO^3)	
LC50 Human	460 ppm (1460 mg/m^3)	59.85
IDLH value	3.0ppm (15mg/m^3)	587.63
TLV value	0.2 ppm (1mg/m^3)	1349.6

Results

- LC50 HUMAN (460 ppm) area up to 59 meter, IDLH (Immediate danger to life and health) concentration area up to 587.63 meter and TWA (0.2 PPM) area up to 1349.6 meter. Therefore 587.63 meter area in wind direction is considered as evacuation area.

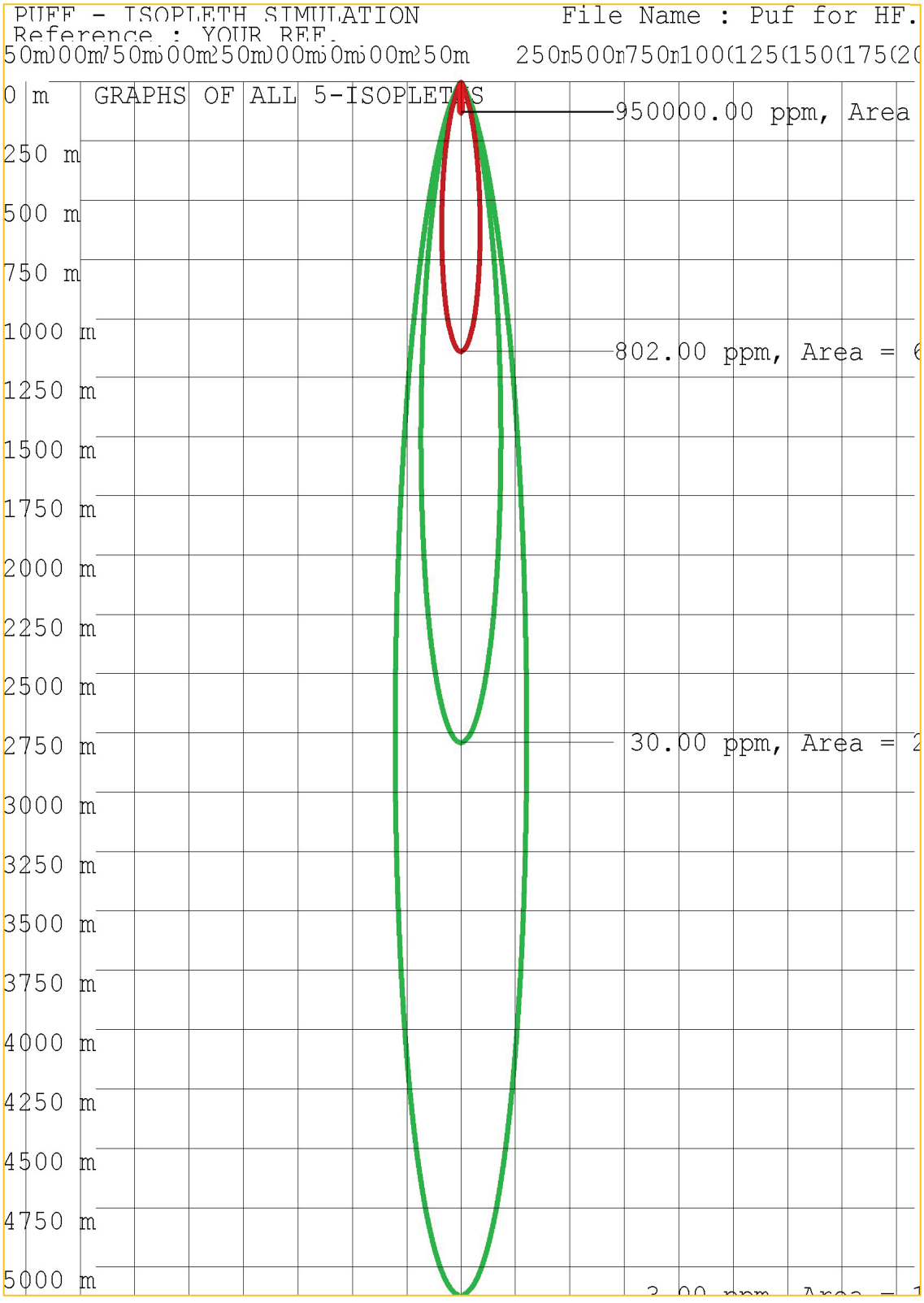

SPILL POOL - ISOPLETH SIMULATION Tuesday, June 08, 2010 File Name : Sce-19 Spill Pool evapofor for sulfuric acid
Reference : YOUR REF.
500m 400m 300m 200m 100m 100m 200m 300m 400m
0 m
GRAPHS OF ALL 5-ISOPLETHS
2173.85 ppm, Area = 56.21 sqm
1082.64 ppm, Area = 80.88 sqm
460.00 ppm, Area = 573.96 sqm
100 m
200 m
30.00 ppm, Area = 1593.86 sqm
300 m
400 m
500 m
3.00 ppm, Area = 14690.62 sqm
600 m
700 m
800 m
900 m
1000 m
1100 m
1200 m
1300 m
0.30 ppm Area = 75894.79 sqm

Scenario – 12 Puff Release for Hydrofluoric Acid 25 M3 Bullet catastrophic failure

TABLE – L Puff Release for Hydrofluoric Acid 25 M3 Bullet catastrophic failure		
Scenario : PUFF RELEASE		
In put Data		Results of Computations
Stored quantity	25 M^3	End point (meter)
Release Rate	1320 Gms/ Sec.	
LC50 Human	802.0 ppm	1142.17
IDLH value	30.0 ppm	2790.06
TLV value	3.0 ppm	5116.59

Results

- LC50 HUMAN (802 ppm) area up to 1142.17 meter, Immediate danger to life and health (30 ppm) concentration area up to 2790.06 meter and TWA (3 PPM) area up to 5116.59 meter. Therefore 2790.06 meter area in wind direction is considered as evacuation area.

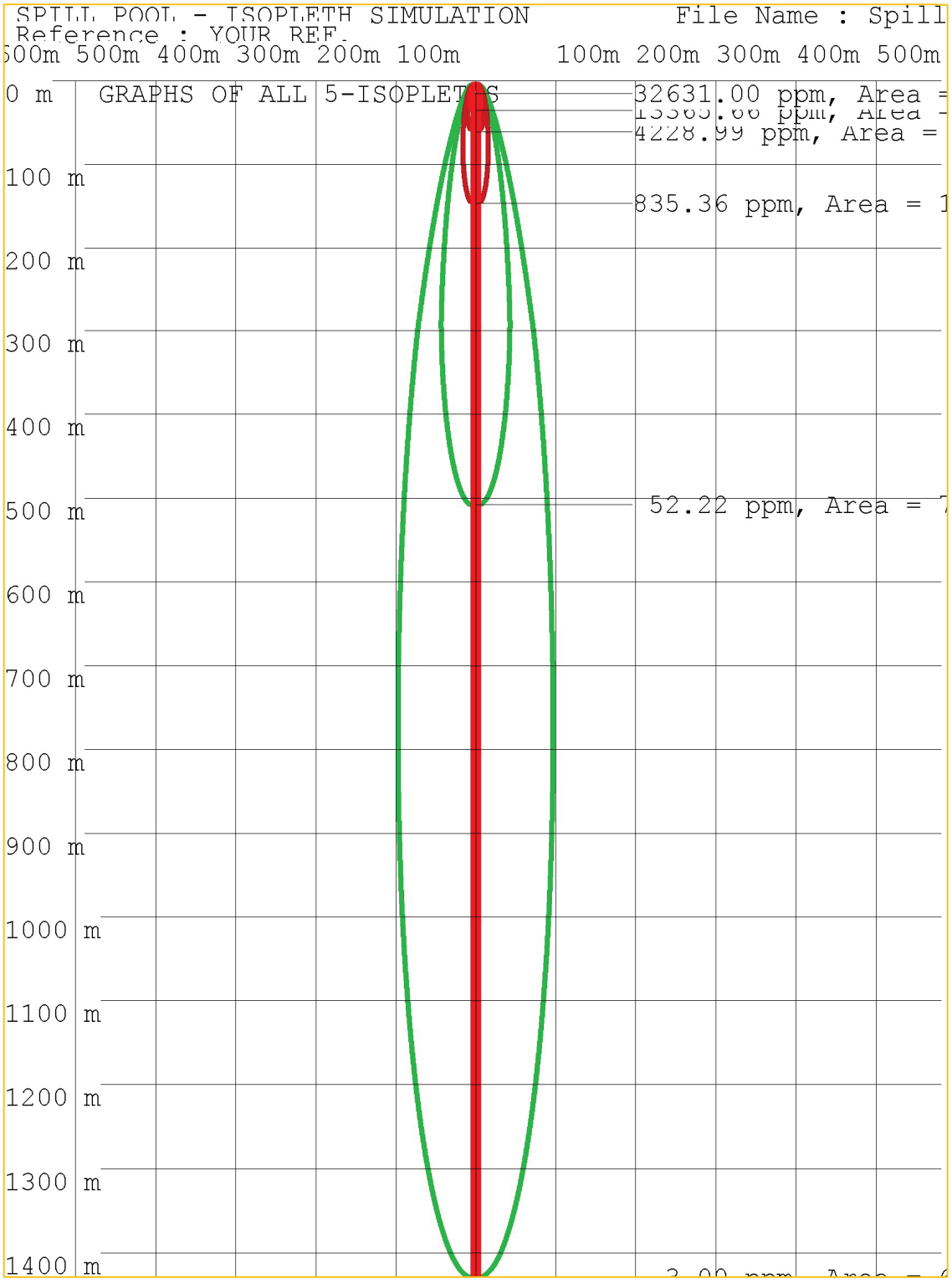

PUFF - ISOPLETH SIMULATION
File Name : Puf for HF.
Reference : YOUR REF.
50m 00m 750m 00m 250m 00m 0m 00m 250m
250 500 750 100 125 150 175
0 m
GRAPHS OF ALL 5-ISOPLETHS
950000.00 ppm, Area
802.00 ppm, Area =
30.00 ppm, Area =
250 m
500 m
750 m
1000 m
1250 m
1500 m
1750 m
2000 m
2250 m
2500 m
2750 m
3000 m
3250 m
3500 m
3750 m
4000 m
4250 m
4500 m
4750 m
5000 m

Scenario – 13 Spill Pool evaporation module for Hydrofluoric Acid 25 M3 Bullet catastrophic failure

TABLE – M Spill Pool evaporation module for Hydrofluoric Acid 25 M^3 Bullet catastrophic failure		
Scenario : SPILL POOL		
In put Data		Results of Computations
Stored quantity	25 M^3	End point (meter)
Release Rate	1320 Gms/ Sec.	
LC50 Human	802 ppm	146.42
IDLH value	30 ppm	507.99
TLV value	3 ppm	1428.75

Results

- LC50 HUMAN (802ppm) area up to 146.42 meter, IDLH (Immediate danger to life and health) concentration area up to 507.99 meter and TWA (3 PPM) area up to 1428.75 meter. Therefore 507.99 meter area in wind direction is considered as evacuation area.


SPILL POOL - ISOPLETH SIMULATION
File Name : Spill
Reference : YOUR REF.
500m 500m 400m 300m 200m 100m
100m 200m 300m 400m 500m
0 m
GRAPHS OF ALL 5-ISOPLETHS
32631.00 ppm, Area =
4228.99 ppm, Area =
835.36 ppm, Area = 1
52.22 ppm, Area =
100 m
200 m
300 m
400 m
500 m
600 m
700 m
800 m
900 m
1000 m
1100 m
1200 m
1300 m
1400 m

CHAPTER 10: INFORMATION ON MITIGATION OF MAJOR ACCIDENTS

10.1 FIRE PROTECTION ARRANGEMENTS

The fire water system comprised of electrical motor and diesel driven fire water pumps, fire water jockey pumps, distribution network /grid, fire water spray system on select area local application, fire water hydrants and monitors, FEH for storied buildings, hose reel hose, hose boxes. Besides, different types and capacities of fire extinguishers are also provided considering the area fire risk. In addition to above equipment's and system, a full-fledged fire station is also established. On 24x7 basis, one multipurpose fire tender and manpower for firefighting purpose is also available.

FIRE WATER PUMPS:

Main and alternate fire water pump house and fire pumps: There are two fire water pump houses provided inside the premises and are located adjacent to each other. The pump house and pump details are as below:

Under Ground Pump House

Sr. No.	Type of pump	No. of pumps	Capacity
1	Electrical (Main)	3 nos.	273 m^3/hr each
2	Diesel (Standby)	1 no.	273 m^3/hr
3	Jockey Electrical	2 nos.	28 m^3/hr

Above Ground Pump House

Sr. No.	Type of pump	No. of pumps	Capacity
1	Electrical (Main)	2 nos.	273 m^3/hr each
2	Diesel (Standby)	1 no.	273 m^3/hr
3	Jockey Electrical	1 nos.	28 m^3/hr

FIRE WATER RESERVOIR:

The fire water reservoir capacity is 2500 M^3 capacity. The fire water is fetched from the RCC tan k which is located in the Utility section. The tank is common for process as well as fire water usage, which caters the purpose of fire water and general water requirement. The tapping's for the process water pumps is taken at higher level so that the capacity of the reservoir between the low water level and general water tapping's can be used exclusively for firefighting purpose. The water availability for firefighting is 2500 M^3.

The fire pump arrangement is such that a positive suction to the fire pumps is ensured at all time.

FOAM SYSTEM FOR HYROCARBON STORAGE TANKS

Methanol and the spent Methanol is stored in a fixed RO of storage tanks. These storage tanks are not found protected by semi fixed foam flooding system.

NON WATER BASED SYSTEM FOR DCS PANEL OF PLANT CONTROL ROOMS

The server rooms and DCS panel rooms of plant control rooms are not protected with non-water based fixed fire protection system.

CABLE CELLAR PROTECTION

The cable cellars of the plant areas & CPP are not protected with auto/manually operated water spray system.

TURBINE FIRE PROTECTION

The CO_2 flooding system is provided for the protection of gas turbine of HRSG & HTG of CPP plant. A spare battery of the cylinders is also available for emergency replacement.

MANPOWER FOR FIRE FIGHTING, FIRE EQUIPMENTS AT FIRE STATION & FIRE EXTINGUISHING MEDIA

AVAILABILITY: The GFL Complex is having its own fire station with one mobile fire appliance (Tender) and other fire-fighting equipment. These spare fire equipment are kept in racks at fire station. The fire station is manned on 24x 7 basis

MULTIPURPOSE FIRE TENDER - 1 NOS.

GFL- Dahej is having a Multi Purpose Fire Tender to deal with the various kind of fires. Fire Tender is carrying the multiple extinguishing media i.e. Water, Foam & DCP.

The details are as below.

Water Tank Capacity	3000 Ltr.
Foam Tank Capacity	1000 ltr
Pump Capacity	3200 LPM
Pump Type	Centrifugal
Engine no.	697TC55F5Z131978
Chassis no.	373363FSZ122508
Water output delivery	4
Water & Foam Monitor	1
Aluminum Extension Ladder	1
Suction Hose Pipe	4
Hose Reel 30 Meter	1
Hose pipe 15 Meter	8
75 Kg DCP Type F/Extinguisher	500 KG DCP
22.5 KgCo2 Type F/Extinguisher	6X 22.5
6 Kg DCP Type F/Extinguisher	2
Foam	0
BA Set	4

Sr. No.	Plant	DCP (Cartridge)	DCP Store Pressure	DCP Trolley Type	CO_2 Fire Extinguisher	Foam Fire Extinguisher	Water CO_2 Type	Foam Trolley	Sand Bucket	SCBA Set	Cascade
1	CA	33	2	0	17	0	0	0	31	11	2
2	CMS	85	6	0	24	0	0	2	18	6	0
3	CPP	33	6	0	14	2	1	0	8	1	0
4	New CPP	8	0	0	9	0	0	0	5	0	0
5	CO2 Plant	4	0	0	8	0	0	0	0	1	0
6	CCGT	22	6	1	18	2	0	0	24	1	0
7	$CaCl_2$	10	1	0	7	0	0	0	0	1	0
8	New $CaCl_2$	2	0	0	1	0	0	0	0	0	0
9	ETP	4	0	0	3	0	0	0	1	1	0
10	CA Flaker	11	0	0	6	0	0	0	0	0	0
11	PT-PTPTFE	28	6	0	21	0	0	0	4	1	0
12	PTFE	67	2	0	21	0	0	0	0	4	0
13	TFE-1	47	25	0	5	0	0	0	0	3	0
14	TFE-2	26	1	0	18	1	0	0	0	3	0
15	S & A	22	0	0	27	0	0	0	0	3	0
16	D-PTFE	40	3	0	30	0	0	0	0	2	0
17	A & H	61	0	0	50	0	0	0	9	14	0
18	CU	3	0	0	11	0	0	0	0	0	0
19	Store	3	6	0	1	0	0	0	0	0	0
20	Admin	9	34	0	3	0	0	0	0	0	0
21	Ware House	8	1	0	0	0	0	0	0	0	0
22	Surfactant Recovery - 1	1	0	0	2	0	0	0	0	0	0
23	Surfactant Recovery - 2	6	0	0	6	0	0	0	0	0	0
24	Fire Station	5	60	0	38	0	0	0	0	6	0
25	ETFEE	8	0	0	0	0	0	2	8	2	0
Total		546	159	1	340	5	1	4	108	60	2

10.2 ALARM SYSTEMS

1. Manual Call Points(MCP)

Manual Call Points are located at various places in the plant area and inside the building. As soon as any F one breaks the glass of MCP, it gives parallel alarm in the Control Panels which are located in Main Control room & Fire Station. The location of MCP breakage will be known from the Panels. The person on noticing the alarm (which means fire or any other emergency) shall communicate the emergency message to fire control room and / or plant main control room.

2. Telephones

Each department of the company are connected by internal telephones. External phone at office and residence of the Key Personnel and top executives of the company is also provided.

3. Emergency Sirens

when the area of plant site and the number of installations are more, siren has to be installed for general communication to media. It can be used for declaring the on-site as well as off-site emergency. And making the major emergency known to the people. Siren not only communicates the emergency to the plant personnel but also to the surrounding areas of the factory.

Declaration of Major Emergency And Emergency Alert Codes

The declaration of major emergency puts many agencies on actions and the consequences may be serious, therefore such declaration should not be decided on whims or immature judgment or without proper thoughts. Because of the scale of activity which will be activated after the declaration of a major emergency, it is advisable to restrict the authority to declare it. In Gujarat Fluorochemicals Limited, Site Main Controller shall declare major emergency. For the purpose of determining the level of emergency response support required the following three emergency alert codes are used for the notification of emergencies:

4. Alert I Emergency

Any incident which is considered to be minor in nature and has no potential risk of threatening lives or facilities in the plant and it is within the capability of the ERT to conduct initial containment for spills, suppression of fires, or rescue operations for personnel shall be classified as Alert I emergency. Typical examples are:

- Minor fires involving plant equipment which can be extinguished easily
- Minor gas or toxic releases which can be isolated easily within a short period of time
- Minor building fires or fires involving non-process/plant equipment
- Minor hazardous material spills or releases from road tankers or storage tanks which can be contained by dike or absorbent materials or recovered by vacuum cleaner.

5. Alert II Emergency

Any incident which is considered to be serious in nature and, though it is still within the capability of the ERT to handle, has a potential risk of threatening other facilities or buildings on site or off-site shall be classified as Alert II emergency. Typical examples are:

- Fires involving flammable storage tanks or plant equipment
- Gas or toxic releases of relatively large quantity but can be isolated safely
- Spillage of flammable or hazardous substances which requires substantial resources for cleaning up or recovery

6. Alert III Emergency

Any incident considered being beyond the capability of the ERT to handle and it requires the assistance from external emergency agencies such as the Fire Service shall be classified as Alert III emergency. Typical examples of Alert III emergency are:

- Major and prolonged fires involving the plants or storage tanks.
- Major and prolonged gas or toxic releases due to catastrophic failure of process equipment or storage tanks which warrant a site-wide evacuation.
- Major hazardous materials spills due to catastrophic failure of process equipment, storage tanks or road tankers.

10.3 EMERGENCY PLAN ORGANIZATION USED TO FIGHT EMERGENCY, ALARMS AND COMMUNICATION ROUTS, GUIDELINE FOR FIGHTING EMERGENCY, INFORMATION ABOUT HAZARDOUS CHEMICALS, AND EXAMPLE OF POSSIBLE ACCIDENT CONSEQUENCES

KEY PERSONS OF THE ORGANIZATION AND RESPONSIBILITIES DURING EMERGENCY:

The single organization structure shall be created and the same shall be continued till the emergency is over. The order a commend, channel of information and action as required during the emergency, shall be specified by the emergency management. The organization chart provides the responsibility and line of command by the management.

The arrangement of communication system shall to be Fool-proof hence the correct and specific massage should reach to the proper person within shortest time. The emergency telephone numbers are in Annexure of internal & external list. The role and responsibility of individuals are explained in foregoing para. The following details indicates the emergency management command and control.

1. Site Main Controller (General Manager/ Manager HR)

Step -1

In case of major emergency (e.g. big fire, Big Spillage, Explosion) condition

Incident main controller may ask for emergency declaration to you and in that condition Plant head(Site Main Controller) has to give permission for emergency declaration after proper hearing from incident main controller (EHS In-Charge /Security In-Charge)than siren will be blown plant wide to evacuate the plant personnel to safer location and Site main controller – GM/ Manager HR will move to the site to take stock of the situation and seat in to the emergency control Centre to take charge of the entire plant emergency.(Emergency control centre –Safer location office decided by incident Main controller)

Upon requirement of emergency he will direct / assist to management team to perform different function to control the emergency

Step -2

Remain in contact with Incident main controller

Step -3

Over all responsible for controlling the emergency

2. Site controller:

Section Manager / Section Chief / Plant engineer (Hot end, Cold end, ware house, Process plant, Logistics) acts as the Site controller during emergency including operation head

Activity to be performed at the time of emergency siren / in emergency call

Step-1

When emergency siren blown and emergency is not in your area than ensure all PLC operator, critical operation persons shall remain inside the plant to run the plant smoothly and also ensure that if operators are under threat of emergency than take permission from operation head and accordingly do some shut down work if really necessary. Other than critical PLC operations, direct work technicians shall move toward assembly point

Step-2

If needed than plant inside persons help to rescue operation team

Step-3

If emergency is in your area and if rescue team members not reached at that site than dial 205 (emergency number) and inform to security about emergency and also inform to EHS In-Charge / incident main controller (security officer)

Step-4

If you are at assembly point with your team than ensure that they shall stand in a queue for attendance verification and help personnel department for attendance verification

Step-5

Ensure that first aider and fire fighter stand separately from your department and they shall approach to the emergency site as and when required

3. Incident main controller

(EHS In-Charge /Security In-Charge) on the duty acts as an Incident Main controller)

Step-1

When emergency siren blows than immediately rush to the site with security team or on receiving of the emergency call also rush to the site with security team

Step-2

Ensure one security remains at gate and gate shall be closed for the time being.

Step-3

Direct the fire and rescue team

Step-4

Executes all jobs to control the emergency such as isolation, diversion of the process to the other areas, arrange for removal of combustible / inflammable material from the scene of emergency

Step-5

Arranges for assistance from Manager/Chief/ Plant engineer and maintenance dept. rendering services as may be required for the effective control of the situation.

Step-6

Communicate and coordinates various activities with other emergency team members.

Step-7

Takes full responsibility for handling equipment's, materials, tools that may be needed during the course of emergency in liaison with the site controller.

4. Communication In-Charge

(HR Manager acts as the communication In-Charge)

Step-1

On emergency siren blown he and his team rush to the assembly point with attendance data of the shift

Step-2

Responsible for the head counts at the Assembly point.

Step-3

Complete responsibility of providing medical assistance and treatment during emergency. Provide and arranges for emergency vehicle and medical facilities from outside agencies and hospitals, if required.

Step-4

Co-ordinates the activities of the first aid to be provided. Maintain the list of names of all personnel for whom treatment has been given and others that have been directed to the hospital

Step-5

Maintains liaison with press, disclose the correct and appropriate information to avoid rumours and confusion.

Step-6

Co-ordinates with Police/fire brigade, other government and nongovernment agencies.

5. Environment, Health & Safety In-charge

Step-1

On siren hearing or any emergency situation rush to the site and do rescue operation and help rescue operation team

Step-2

To ensure that emergency does not escalate, but is contained and extinguished within the spot of occurrence

Step-3
To coordinate personnel who have been trained in firefighting & first aid.

Step-4
Give proper direction to the fire brigade from outside agency, he will help the fire brigade in firefighting and First Aid team in providing first aid as well as search operation (if required).

6. Auxiliary Facilities In-charge:

Step-1
On information about emergency, send one Operator to fire hydrant pump

Step-2
Keep Some Operators to handle Critical Utilities. He and his Shift team shall go to the site and do some necessary shut down work and help rescue team for the emergency

Step-3
Takes care of all electrical / mechanical work.

Step-4
Ensure uninterrupted power supply to fire hydrant pump house and ensure the diesel stock for diesel operated pumps

Step-5
After completion of emergency reinstate the operation

7. Security

Step-1
Any kind of emergency alarm comes. Close the main gate and then rush to the site. Left one security at gate. Who will inform to security In-charge, EHS In-charge and other relevant Manager/ Chief or Plant engineer including plant head about the emergency

Step -2
To activate siren as per information from Incident controller / EHS In-charge information

Step-3
To help in cordoning off the emergency area and will prevent unauthorized entry of people.

Step-4
Do activity as per instruction of incident controller

8. Dispatch In-charge:

Step-1
On receiving call / emergency siren he and his team rush to assembly point

Step -2
Ensure that trucks remain at one side and there will be no unnecessary movement of trucks until permitted from your side

9. Finance In-Charge:

Step-1
On hearing of emergency siren, he shall move toward assembly point along with his team members and do as per instruction of Site Main Controller (General Manager/ Manager HR) for emergency help

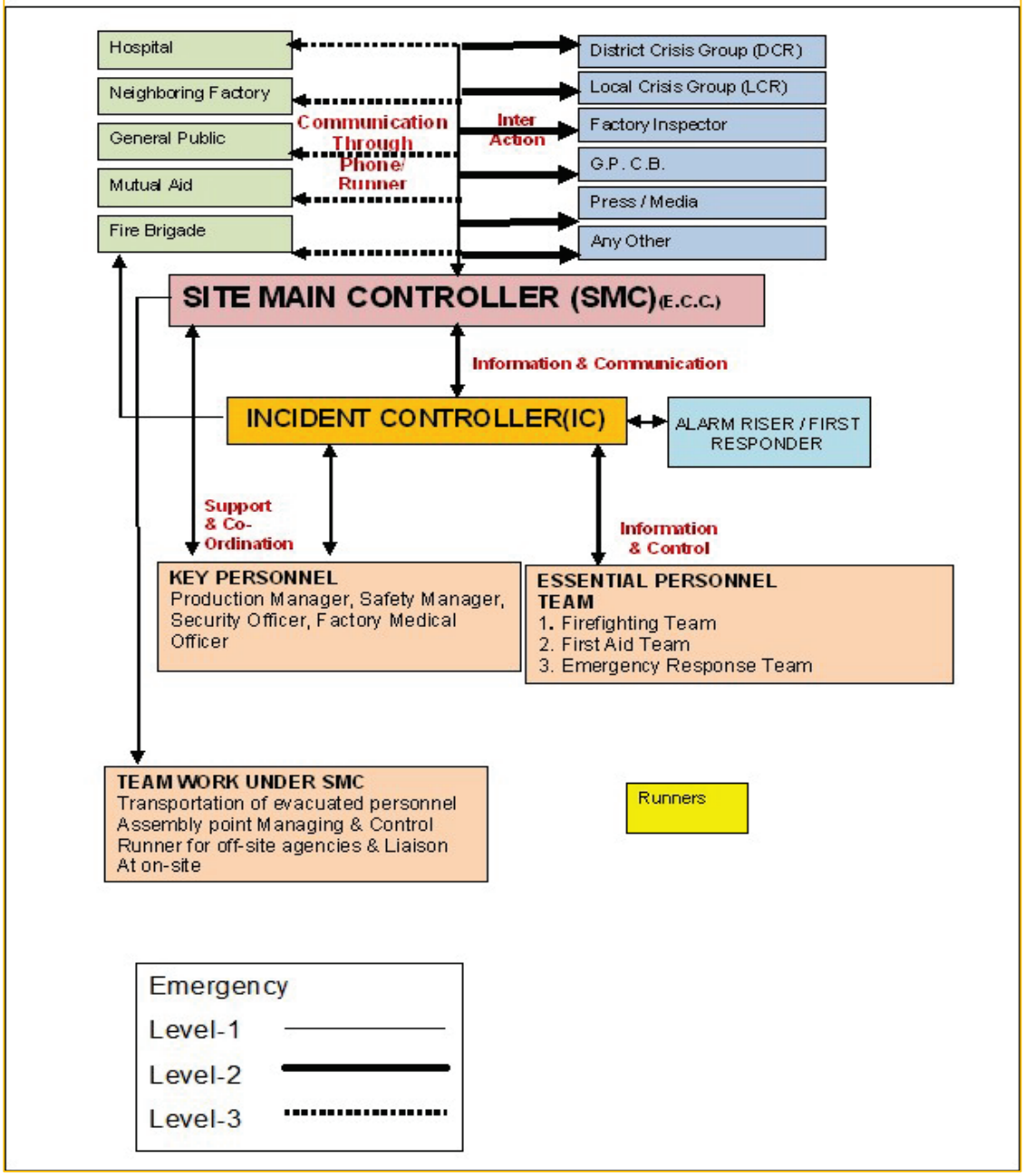
10. Civil In-Charge:

Step-1
Emergency condition move to assembly point and do as per instruction of GM/ Manager HR.

Step-2
Ensure persons working under civil availability at the assembly point

Step-3
If emergency is in your area than remain at the site and combat the emergency and inform to security gate/ EHS In-Charge for help

Emergency Organization Chart



EMERGENCY INSTRUCTION BOOKLET

Sr. No.	Role to be played as (Name Emergency Designation Viz, Incident Controller, Particular Key person OR Essential Worker doing the job of)	His emergency duties/functions (narrate in short and clear sentence and 1,2,3___)	Also refer (other relevant document of the factory viz. Safety manual etc.)	He should report at (the incident player or control room etc.)
01	Incident Controller (IC)	1) Take charge at the scene of incident and assess the scale of emergency 2) Decide for continuing the operation of the plant 3) Ensure that outside emergency services have been called in 4) Ensure that SMC & key persons have been called in 5) Direct firefighting operation to internal as well as external agencies 6) Direct essential workers, to carry out their duties 7) Brief the SMC 8) Preserve evidences for subsequent fact, finding investigations	---	Accident Site
02	Deputy Incident Controller (DY. IC)	1) Immediately reach at the scene of incident & help IC 2) Will act as IC in his absence 3) Will ensure about the emergency by communication to other departments 4) Will appraise government & other authorities	---	Accident site
03	Site Main Controller (SMC)	1) In consultation with IC will declare emergency 2) Ensure for mutual aid help 3) Will direct key personal for transport control etc.	---	Emergency control centre
04	Key Personnel	1) Will take other directives from IC and SMC 2) Individual key person will act in his respective duties	---	ECC

05	Essential Workers	3) Hearing the siren will rush to the scene of incident to take directives from IC 4) Helping in firefighting, first aider and other works	---	Accident site
06	First Aid / Medical Team	3) On hearing siren send vehicle in the plant for removal of the affected 4) Help in firefighting, first aid and other works 5) Inform doctor about the emergency and casualties	---	First aid site
07	Public Relation /Team Manager	2) Team is headed by manager 3) Appraise SMC about affected area & public 4) Name all arrangement for victims 5) Arrange for transport & evacuation arrangement	---	Office
08	Non-Essential Workers	42) Assemble at assembly points if situation demands 43) Do not obstruct any activity being done for 44) Take instructions from IC for the that plant activities	---	Assembly Point (If Required)

10.4 CO–ORDINATION WITH DISTRICT COLLECTOR OR THE DISTRICT EMERGENCY AUTHORITY AND ITS OFF SITE PLAN

1. PURPOSE OF THE OFF SITE EMERGENCY PLAN:		
The main object of the off site plan is to create preparedness and to control various types of emergencies/disaster.		
The main purposes of the off-site emergency plan are:		
1.	To provide the local authorities, police, fire brigade, doctors, surrounding industries and the public, the basic information of risk and environmental impact assessment and to appraise them of the consequences and the protection/prevention measures and control plan and to seek their help to communicate with the public in case of a major emergency. This information from every industry enables the District Authorities to educate the public that what can go wrong, the measures taken and to train them of their individual role in case of emergency.	
2.	To assist the local/District Authorities for preparing the off-site emergency (contingency) plan for the district or particular area to organize rehearsals from time to time and initiate corrective actions based on the lessons learnt. This will include:	
	(a)	To prepare a site plan identifying industries, hazardous points, control points, assembly points, hospitals, dispensaries, fire station, police station, railway station, bus station, transport points, roads and all other requisite details.
	(b)	To verify the information given by the industries to comprehend dangers and to arrange for adequate personal protective, firefighting and emergency equipment.
	(c)	To establish command structure and to identify the respective roles of the senior personnel of various service groups, toxicity control and de-contamination squads and various authorities of water, power, gas, health, labour, environment, revenue, explosive, pollution control, press, post, telephone, wireless, railway, transport and social services etc. Necessary representatives of employers and employees shall also be incorporated. Various organizations, their duties, equipment, implementation procedure and action on-site and off-site, warning system, communication system, co-ordination system, control centres, key personnel shall be prescribed.
	(d)	Plan to carry out training programmes in safety, health and environmental protection for the concerned parties. Necessary publication will also be useful.
	(e)	To maintain full liaison between all agencies to this plan, industries, emergency services etc.
	(f)	To plan for the antidotes, remedial medicines and equipment in the hospitals and to carry out research for them for latest and effective measures, Sufficient stock and mutual aid scheme will be useful.
	(g)	To provide for continuous monitoring system for essential parameters of pollution to judge malfunctioning at the initial stages and warning system at appropriate places. Meteorological information regarding prevailing weather conditions, wind velocity and direction, rain and flood data for such data-collection.

	(h)	To appoint a record keeper, historian and staff to collect information on the causes of disaster and to maintain the record thereof and also of the plan-proceedings.
	(i)	To carry out mock drill and rehearsal of this plan to ensure its efficacy, test and response, interaction and co-ordination of operators, various service organizations, evaluate the effectiveness and adequacy of the equipment and to gain experience and confidence to implement the plan. The finalized Disaster Plan shall be given to all concerned for implementation and rehearsal.
	(j)	To operate this plan at the time of offsite emergency by the Chairman, i.e., the District Collector. Such operation shall include:
		1. To contain, limit, localize and minimize the loss and damage to persons, property and environment arisen from the accident on road or industry, transport, storage or otherwise. To plan to decrease the potential of the disaster.
		2. To prevent the spread and re-happening of the disaster.
		3. To inform people and surrounding about emergency and disaster if it is likely to adversely affect them. Machinery will be established for this purpose to guide the people in proper way.
		4. To plan for rescue and recuperation of casualties and injuries. To plan for relief and rehabilitation.
		5. To plan for evacuation, safe assembly points and transportation required.
		6. To plan for prevention for harms, total loss and recurrence of disaster. It will be ensured that absolute safety and security is achieved within the shortest possible time.

2. LOCAL CRISIS GROUP

As per the Chemical Accidents (Emergency Planning, Preparedness and Response) Rules 1996, District Crisis Group and Local Crisis Group have to be constituted. The constitution and functions of Local Crisis Group are as below:

FUNCTION:

Under the above rules functions of the LOCAL CRISIS GROUP reproduces below. (Rule No.10)

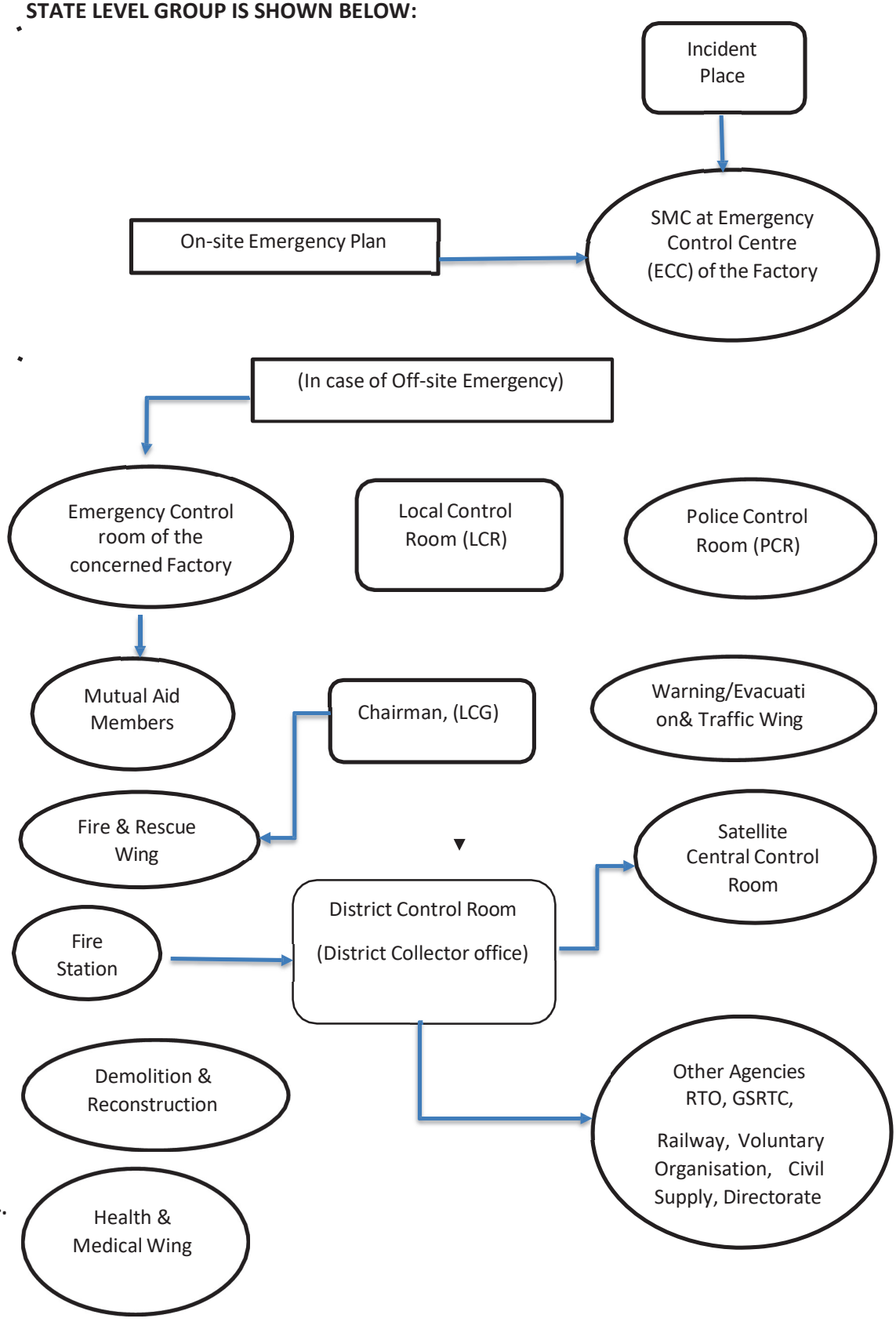
(a)	Prepare local emergency plan for the industrial pocket;
(b)	Ensure dovetailing of the local emergency plan with the district off site emergency plan;
(c)	Train personnel involved in chemical accident management;
(d)	Educate the population likely to be affected in a chemical accident about the remedies and existing preparedness in the area;
(e)	Conduct at least one full scale mock-drill of a chemical accident at a site every six months and forward a report to the District Crisis Group;
(f)	Respond to all public inquiries on the subject.

Rule 12: Aid and assistance for the functioning of the District and Local Crisis Group

(1)	The Major Accident Hazard installations in the industrial pockets in the district shall aid, assist and facilitate the functioning of the Local Crisis Group.
(2)	The Major Accident Hazard installations in the industrial pockets shall also aid, assist and facilitate the functioning of the Local Crisis Group.

Rule 13:Information to the public	
(1)	The Central Crisis Groups shall provide information on request regarding chemical accident prevention, preparedness and mitigation in the country;
(2)	The State Crisis Group shall provide information regarding possible chemical accident at a site in the industrial pocket and related information to the public on request.
(3)	The Local Crisis Group shall provide information regarding possible chemical accident at a site in the industrial pocket and related information to the public on request.
(4)	The Local Crisis Group shall assist the Major Accident Hazard installations in the industrial pocket in taking appropriate steps to; inform persons likely to be affected by a chemical accident.

3. SCHEMATIC DIAGRAM SHOWING ACTION FROM INCIDENT PLACE TO DISTRICT COLLECTOR OF THE DISTRICT EMERGENCY AUTHORITY AND SUBSEQUENTLY TO THE STATE LEVEL GROUP IS SHOWN BELOW:



4.

List of External Emergency Telephone Numbers

Sr. No.	Location	Telephone No.
1.	Director, Industrial Safety & Health, Ahmedabad	(079) 226 84249 / 54
2.	Dy. Director, Industrial Safety & Health, Bharuch	(02642) 240421 (O) / 225 838(R)
3.	District Collector, Bharuch	(02642) 243499 / 240600
4.	Dy. Collector, Bharuch	(02642) 240900 / 241980
5.	DSP, Bharuch	(02642) 269303 / 269333
6.	Police Station, Dahej	(02642) 256 233
7.	Mamlatdar, Vagara	(02642) 225 221
8.	Fire Brigade, Nagarpalika, Bharuch	(02642) 240 008
9.	Fire Brigade, GNFC, Bharuch	(02642) 247001,2,3 / 249828
10.	Primary Health Centre, Dahej	(02641) 256 223
11.	Bharuch Hospital, Bharuch (Patel Welfare)	(02642) 244 880
12.	Civil Hospital, Bharuch	(02642) 241759 / 243515
13.	Bhailal Amin, Vadodara	(0265) 2380300 / 2381301
14.	Doctors of surrounding Inds. – IPCL	(02641) 256 666
15.	Doctors of surrounding Inds. – Birla Copper	(02641) 256 004 – 06 / 09
16.	GPCB, Bharuch	(02642) 246333
17.	Chief Controller of Explosives, Nagpur	(0712) 510103 / 510580 Fax: (0712) 510577
18.	Controller of Explosives, Vadodara	(0265) 2420512 / 2540922
19.	Disaster Management Centre, Dahej	(02641) 256 670 Mobile: 98244 75575
20.	Boiler Inspector, Bharuch	(02641) 250 280
	Boiler Inspector, Baroda	(0265) 243 5125
	Chief Inspector of Boiler, Ahmedabad	(079) 2268 5205 / 2268 5206
21.	GEB, 220KV Sub-station, Dahej	(02641) 256 523
22.	GEB, 200 KV Haldarva, Bharuch	(02642) 246 271
23.	Electrical Inspector, Bharuch	(02642) 243 770
24.	Central Excise & Custom Dept., Bharuch Range, Bharuch	(02642) 249389
25.	Oriental Insurance Company Ltd., Baroda	(0265) 242 7075 / 242 6380
26.	Reliance Ind.Ltd. Dahej	(02641)615891/92
27.	GACL, Dahej	256315 / 16 / 17 / 18
28.	Birla Copper, Dahej	(02641) 256004,06,09
29.	GCPTCL	(02641) 256604-05
30.	PETRONET LNG	(02641) 257249
31.	WELSPUN	(02641) 256011
32.	Gujarat Florochem Ltd.	(02641) 256073
33.	GACL, Dahej	(02641) 256013,131

10.5 NOTIFICATION OF THE NATURE & SCOPE OF THE HAZARD IN THE EVENT OF AN ACCIDENT

Information to be furnished in below format as mentioned Schedule-6 of GFR 1963 of Major Accident.

SCHEDULE-6

[See rule 68-J (4) (1)] Information to be furnished Regarding Notification of a Major Accident

1. General data
   - (a) Name of the site
   - (b) Name and address of the occupier (Also, state the telephone/telex number)
   - (c) (i) Registration number
   - (d) (ii) License number (As may have been allotted under any status) (Applicable to the site. E.g. the Factories Act)

2. Type of major accident

Explosion		Fire		Emission of hazardous c hem	

3. Description of the major accident
   - (a) Date, Shift and hour of the accident ----------
   - (b) Department/Section and exact Place Where the accident took place----------
   - (c) The process/operation undertaken in the Department/Section where the accident took place. (Attach a flow chart, if necessary.)----------
   - (d) The circumstances of the accident and the hazardous chemical involved: ----------

4. Emergency measures taken and measures envisaged to be alleviate short-term effects of the Accident: ---

5. Cause of the major accident

Known (to be specified)	
Information will be supplied As soon as possible.	

6. Nature and extent of damage
   - a. within the establishment ---------- Casualties
     _____killed
     _____injured
     _____poisoned
   - b. -----persons exposed to the major accident _____

---material damage	
---damage is still present	
--- danger no longer exists	

   - c. Outside the establishment ---------- casualties
     _____injured
     _____poisoned
     Persons exposed to the major accident_____

	---- Material damage
	- --- Damage to environment
	---- Damage in still present
	---- Ganger no longer exists

7. Data available for assessing the Effects of the accident on persons and environment: ----------
8. Steps already taken or envisaged
   - a. to alleviate medium or long term effects of the accident:
   - b. to prevent recurrent of similar major accident:
   - c. Any other relevant information.

10.6 ANTIDOTES IN THE EVENTS OF A HAZARDOUS CHEMICALS

SR. NO	ANTIDOTE	AGAINTS WHICH CHEMICAL USED	TARGET ORGANS
1	INJ. CALCIUM GLUCONATE	HYDROFLUORIC ACID	Bone heart
2	PREVOR ANTI HF KIT	HYDROFLUORIC ACID	Bone
3	INJ. HYDROCORTISONE	VARIOUS CHEMICAL EXPOSURE	Lungs
4	ACTIVATED CHARCHOL TAB	ingestion of various chemicals	Stomach
5	MILK OF MAGNASIA	Ingestion of various chemicals	Stomach
6	ANTI SNAKE VENOM	SNAKE BITE	brain blood
7	INJ RABIPUR	DOG BITE	brain
8	INJ TETANUS	FOR TETANY(USED IN MECHANICAL INJURY)	Muscles
9	INJ METHELINE BLUE	ANILINE EXPOSURE	blood

CHAPTE 11: LIST OF ANNEXURES

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ANNEXURE- 1

JOB RESPONSIBILITIES OF STAFF MEMBERS

Plant Head:

2) Provide overall direction to carry out activities to achieve & sustain EHS in the plant.
3) Provide resources essential for achieving EHSMS in the plant & to implement Safe operations
4) Ensure the compliance of the statues governed by GPCB, PESO, DISH office for company matters.
5) Ensure effective implementation of Accident Prevention Program.
6) Ensure effective operation of ETP
7) Ensure effective support and functioning of common Occupational Health Centre
8) Ensure effective support and functioning of Fire Station
9) Ensure Safety Training Provision for all employees and trained manpower only
10) Employed for hazardous process / operations

Shift In-charge:

5) To understand SOP's and system and to guide shop floor person to act accordingly.
6) To do activities/processes as per OCP (SOP) / parameters, instructions, training, experience under plant / department guidance.
7) To obtain valid PTW to work for dangerous operations / maintenance activates.
8) To report any unsafe act & unsafe condition to the superior
9) To self-nominate for trainings required to increase safety & efficiency and to ensure all hazardous operation / processes / chemical should be handled by trained operator.
10) To ensure that co-staff & co-workers carry out activities safely to maintain EHSMS in the plant.
11) To set example of Good and Safe Acts- Lead by examples.
12) To make judicious use of materials to minimize waste

Plant Operator:

4) To understand SOP's and system to implement on shop floor.
5) To follow instruction from Shift In charge and Supervisor
6) To work with proper valid PTW / respective SOP
7) To report any unsafe condition / Act to superior
8) To use PPE / RPE

Contract Workmen:

3) To follow instruction from Shift In charge and Supervisor
4) To use and maintained PPE / RPE

ANNEXURE- 2

TRAINING PROCEDURE:

Pre information will be given to all HOD in advance to nominate candidate. Training will be given to the employee as detailed below.

Sr.No	Training Title / Duration	Frequency	Participants	Responsibility/ Trainer
01	Induction on Safety	First day of joining	All Employees	HSE
02	On Job Training (Mentoring System)	On placing in the department / transfer to new department	All Executives and Below	HOD or Senior Executive
03	Specific training based on job	As and when required	All Employees	HOD/Shift executive
04	Short Talks	As and when required	All Employees	Shift in charge
05	Safety signs and symbol	Once in two year	All employees	HSE /Dept HOD
06	PPE and Respiratory protection	Once in two year	All employees	HSE /Dept HOD
07	Fire hydrant and fire extinguishers.	Once in two year	All Employees	HSE /Dept HOD
08	Hazardous substances, identification, Handling, Transport.	Once in a year	All Employees	HSE /Dept HOD
09	Work Permit systems.	Once in two year	All Employees	HSE /Dept HOD
10	MSDS	Once in two year	All Employees	HSE /Dept HOD
11	Accident/ incident investigation.	Once in two year	All Employees	HSE /Dept HOD
12	Electrical safety, earthing, Static electricity, Tag out, lock out.	Once in two year	Engineering Department	HSE /Dept HOD
13	Forklift trucks, mobile platforms.	Once in two year	Warehouse staff	HSE /Dept HOD
14	Laboratory Safety.	Once in two year	Laboratory staff	HSE /Dept HOD
15	Fall protection, Ladder, Scaffolding.	Once in two year	Engineering department	HSE /Dept HOD
16	On site emergency plan.	Once in two year	All Employees	HSE /Dept HOD
17	Process safety Management.	Once in a year	Management staff	HSE /Dept HOD

ANNEXURE- 3
Alarm Systems

Details regarding:

(i) Warning, alarm and safety and security systems.

Emergency hooter coded on high and low pitch is available as warning alarm system. In the case of Emergency the Emergency Central Control will blow the Emergency hooter in wailing sound for Two Minutes and repeating Twice after every 30 Seconds as shown below.

---------STOP----------STOP----------STOP---------

10 2 10 2 10 2 10

Second Second Second Second Second Second Second

This hooter indicates the disaster and all concern should activate on their duties of emergency including the evacuation of the people. The siren is located at E.C.C. & various different locations in the plant area. If the situation is critical and Emergency Central Control is not formed the Incident Controller can ask to blow the siren if required.

The hooter is tested for 30 second on first date of every month at 10.00 hrs to check its effectiveness as per On-site emergency action plan.

Plant security personnel are present on all gates of premises and strategic location for the security of the plant. Any person or employee or contractor personnel is not allowed without proper gate pass.

ANNEXURE- 4

Other Emergency Equipment's at Emergency Control Centre (ECC- Main Gate Security Office)

Sr. No.	Materials kept in the Emergency Control Centre	Numbers of quantity	Person who will handle/operate this
1	External Telephones	2 Nos.	Head HSE
2	Internal Telephones	2 Nos.	Head HR & Admin.
3	Telephone directory - Internal and External	1 No.	Head HR & Admin.
4	Wireless	2 Nos.	Head HSE
5	Map of the Site	1 No.	Head Engineering
6	Factory Layout	1 No.	Head Engineering
7	Layout showing fire hydrant / extinguishers	1 No.	Head HSE
8	Layout Showing emergency control center and assembly point	1 No.	Head HSE
9	Stock sheet of fire extinguishing material and its availability	1 No.	Head HSE
10	Muster role of employees	1 No.	Head HR & Admin.
11	Work permits book	1 No.	Head HSE
12	Gate passes book	1 No.	Head HR & Admin.
13	List of employee blood group	1 No.	Head HSE
14	Note pads, pens, pencil, rubber, stationery	Sufficient Quantity	Head HR & Admin.
15	Copy of On-site emergency plan	1 No.	Head HSE
16	Copy of Off-site emergency plan	5 Nos.	Head HSE
17	Torches	3 Nos.	Head HSE
18	Umbrella	5 Nos.	Head HR & Admin.
19	Raincoat	10 Pairs	Head HR & Admin.
20	Safety shoes	5 Pairs	Head HSE
21	Helmets	10 Nos.	Head HSE
22	Goggles	10 Nos.	Head HSE
23	Ear Muffs	10 Nos.	Head HSE
24	Aprons	5 Nos.	Head HSE
25	Camera with rolls	1 No.	Head HR & Admin.
26	Stop Watch	1 No.	Head HR & Admin.
27	Self-Breathing Apparatus	2 Nos.	Head HSE

ANNEXURE- 5

LIST OF ERT

Name	Designation	Department
ABHISHEK SACHAN	SENIOR OPERATOR	FI PLANT
AJAY BAVALIYA	SENIOR OPERATOR	FI PLANT
PATEL SWAPNILKUMAR UDDHAVBHAI	Lead Engineer	HSEF
NARESH SHIVABHAI PARMAR	Senior Officer	HSEF
HET PATEL	ENGINEER - POLYMER	VDF/R225
SWAPNIL PATEL	LEAD OPERATOR	VDF/R225
JATIN PATEL	PLANT OPERATOR	VDF/R225
RAJESH M PATEL	LEAD OPERATOR	FKM
URVISH S. PATEL	ENGINEER - CMS	CMS PLANT
ABHIJEETSINH M. VAGHELA	ENGINEER - CMS	CMS PLANT
HARSH KOTHARI	ENGINEER - (CHEMICAL)	CMS PLANT
HARSH S DAVE	LEAD ENGINEER	MECHNICAL (CHEM)
RAJEEV M.K. NAIR	ASSISTANT SUPERVISOR	MECHNICAL (CHEM)
ALPESH A RAJ	SENIOR TECHNICIAN	MECHNICAL (CHEM)
HARESH B AHIR	PLANT OPERATOR	FKM
GIRISH M VAIDYA	ASSISTANT SUPERVISOR	FKM
SHYAM D. CHAVDA	BOILER OPERATOR - CPP	CPP
YASH H. PAUN	ENGINEER - CMS	CMS PLANT
URVISH S. PATEL	ENGINEER - CMS	CMS PLANT
HEMANT KUMAR	LEAD CHEMIST	New Polymer (PVDF,PFA/FEP,ADDITIVES)
NISHOO D. SACHAN	SENIOR OPERATOR	PTFE
RITESH KUMAR	SENIOR CHEMIST	New Polymer (PVDF,PFA/FEP,ADDITIVES)
MAHENDRABHAI S. BARIYA	JUNIOR OPERATOR	PTFE
JIGAR T. PATEL	PLANT OPERATOR	PTFE-D
BHAVESH J PATEL	SENIOR CHEMIST - QA/QC	QA/QC - PTFE
SHREERAM Y LEEHE	ENGINEER	DPTFE - 8th /9th reactor
RAKESH RATHVA	PLANT OPERATOR -	DPTFE - 8th /9th reactor
MURLI M BARPANDE	LEAD OFFICER - HSE & ENV.	ETP
HARESH Z PATEL	ASSISTANT SUPERVISOR	ETP
PRAKASH M MOTWANI	CHEMIST	QA - CENTRAL LAB
RAVINDRASINH P. RAJ	LEAD CHEMIST	QA - CENTRAL LAB
SAGAR PATEL	ENGINEER	DPTFE - 08th/09th Reactor
ALPESH T. MACHHI	ENGINEER	DPTFE - 8th /9th reactor

ANKIT KUMAR V. PATEL	JUNIOR PLANT OPERATOR - POLYMER	PVDF
BHAVIN PITHVA	SENIOR OPERATOR	PVDF
HARSHIT N. GAJERA	PLANT OPERATOR -	VDF/R225
ANKITKUMAR RI SHAH	SENIOR OPERATOR	TFE-2
MIHIR F PATEL	ASSISTANT SUPERVISOR	PTFE
TABREZKHAN F PATHAN	SENIOR ENGINEER	MECHANICAL-CPP
YUVRAJSINH HIMMATSINH CHAVDA	JUNIOR PLANT OPERATOR	VDF/R225
VIKEN PATEL	LEAD ENGINEER	TFE-3
KAPIL GEHLOT	ASSISTANT MANAGER (ETP)	ETP
VIKRAM B GOHIL	PLANT OPERATOR - CMS	TFE-2
BIJAYA KUMAR JENA	SENIOR PLANT OPERATOR (POLYMER)	PFA/FEP
DEVENDRA SINGH	PLANT OPERATOR	PFA/FEP
SANJAY KUMAR	PLANT OPERATOR -	TFE-1
VIKRAM B GOHIL	PLANT OPERATOR - CMS	TFE-2
SHAILESH P KACHHADIYA	ASSISTANT SUPERVISOR	A&H
BHAVESH I GOHIL	JR. PLANT OPERATOR - POLYMER	PTFE-D
MEHUL PANCHOLI	SENIOR ENGINEER	MECHANICAL-PTFE
RAVINDRA H YADAV	ASSISTANT MANAGER -	PFA/FEP
ANKIT THAKUR	OPERATOR	FKM
JIGNESH J CHAUHAN	LEAD OPERATOR	PTFE
HEMANT K PATEL	ASSISTANT SUPERVISOR	PTFE
ASHOK MISHRA	ASSISTANT SUPERVISOR	PVDF
SAURABH THANKI	SENIOR ENGINEER	VDF/R225
YOGESH P PATIL	SENIOR OPERATOR -	TFE-3
AFJAL ANSARI	JUNIOR PLANT OPERATOR - POLYMER	FKM
SURESHBHAI M VASAVA	SENIOR TECHNICIAN	MECHANICAL-PTFE
ANKITKUMAR RAJENDRABHAI SHAH	SENIOR OPERATOR	TFE-2
HITESHBHAI V PATEL	SENIOR OPERATOR	TFE-2
SHABHAN KHAN	PLANT OPERATOR -	FKM

JAGDISH B. AHIR	OPERATOR	PVDF
DIGVIJASINH N. RAJ	ASSISTANT SUPERVISOR	PVDF
AKASHKUMAR K. PATEL	JUNIOR PLANT OPERATOR - POLYMER	FKM
RINIK NIZAMA	JR. OPERATOR -POLYMER	DPTFE - 8th /9th reactore
RAKESH M PATEL	SENIOR TECHNICIAN - MECHANICAL	MECHANICAL-PTFE
KINJALKUMAR G. MAKWANA	PLANT OPERATOR (AHF)	A&H
JITENDRASINH N BORASIA	SENIOR CHEMIST - QA	QA/QC - PTFE
HARSH KOTHARI	ENGINEER - (CHEMICAL)	CMS PLANT
UTSAV VIPULKUMAR GANDHI	ENGINEER -CMS	CMS PLANT
CHANDRAKANT R JADAV	SUPERVISOR	CMS PLANT
DEVENDRA G PATEL	SUPERVISOR	CMS PLANT
SUHEL I AGHAM	SUPERVISOR	PTPTFE
NAGENDRA SINGH	CHEMIST - Q.A/Q.C	QA/QC - PTFE
ASHVIN GOHIL	JUNIOR OPERATOR - PRODUCTION (CMS)	CMS PLANT
HARDIPSINH P. PARMAR	JUNIOR OPERATOR	PTPTFE
VIJAY MISTRY	PLANT OPERATOR - CMS	CMS PLANT
BHARAT A MARATHE	ASSISTANT SUPERVISOR	PTFE-D
SANJIV B MAKASANA	SENIOR ENGINEER	CMS PLANT
HRISHIKESH NATH	SENIOR ENGINEER	QA/QC - PTFE
CHETAN N JANI	CHEMIST - Q.A/Q.C	QA/QC - PTFE
JUGENDRA SINGH	OPERATOR - POLYMER	VDF/R225
KUNJAN ASHVINBHAI MODI	JUNIOR ENGINEER -	VDF/R225
AKSHAY D. PATIL	PLANT OPERATOR -	VDF/R225
MANTU KUMAR SAH	SUPERVISOR - ETP	ETP
BHATT NIKUNJ MAHESHBHAI	ENGINEER - PPC	PPC COMPLEX
RAKESH PARMAR	SENIOR OPERATOR	UTILITY
RAHUL A. MEHTA	SENIOR OPERATOR	UTILITY
PATEL HEMANTKUMAR	ENGINEER	ELECTRICAL - DAHEJ B
DHRUV DIVYESH KUMAR	ENGINEER	PRODUCTION - FKM
PRITAM BASU	ENGINEER	ELECTRICAL - POLYMER
PATIL RAKESH RAGHUNATH	Senior Technician	ELECTRICAL
VRAJ PATEL	JR. ENGINEER	MECHANICAL -
PALIWAL NARENDRA MODILAL	SENIOR MANAGER	INSTRUMENT
ROHAN PATEL	SUPERVISOR	PRODUCTION - MP

ARVIND KUMAR	OPERATIONS	PRODUCTION - MP
ISTIYAK AHMED	OPERATIONS	PRODUCTION - MP
DHARMENDRA KUMAR SINGH	Senior Engineer	MECHANICAL
NARESH SHIVABHAI PARMAR	Senior Officer	HSEF
SHAILESH C. GOHIL	LEAD OPERATOR	PTFE
ARPIT VISHNUBHAI PATEL	OPERATOR	PTFE
MANISH KUMAR CHAUDHARY	SENIOR OPERATOR	PTFE
KHIJARALI G MOMIN	ASSISTANT SUPERVISOR	PTFE
YOGESHKUMAR J PATEL	LEAD OPERATOR	PTFE-D
KARTIK VAGHASIYA	PLANT OPERATOR - FI	FI PLANT
RAJESH KUMAR	ASST. SUPERVISOR	FI PLANT
ASHOK I DESHANNAVAR	ASSISTANT SUPERVISOR	ELECTRICAL-CPP
GULAB D RAMRAJE	SUPERVISOR - ELECTRICAL	ELECTRICAL
MALKESH MACHHI	SENIOR OPERATOR	FKM
JAYDEEPSINH DABHI	OPERATOR - POLYMER	VDF/R225
MAYANKKUMAR V. SHAH	ENGINEER - POLYMER	VDF/R225
PRATIK MISTRY	Jr. PLANT OPERATOR - CACL2 PLANT	CACL2
SANJAYKUMAR R MEWADA	ASSISTANT SUPERVISOR	VDF/R225
ALPESH S KESARIA	SUPERVISOR	CACL2
ROHIT MISHRA	ASSISTANT SUPERVISOR - FI	FI PLANT
ALOK TRIPATHI	ENGINEER - FI PLANT	FI PLANT
JITENDRA P. PATEL	LEAD ENGINEER	PTPTFE
AJAY BAVALIYA	SENIOR OPERATOR	FI PLANT
VIKAS KUMAR SHARMA	ASST. SUPERVISOR	PTFE
HASMUKH M RANA	SENIOR OPERATOR - CPP	CPP
SHAILENDRASINH M RATHOD	LEAD OPERATOR	PTFE
JIGARKUMAR K. PATEL	ASSISTANT SUPERVISOR	CPP
VIJAY PRAJAPATI	ASSISTANT SUPERVISOR	FI PLANT
MOHSIN R BHATTI	SENIOR PLANT OPERATOR	CACL2
MARWADI SMIT MANOJKUMAR	ENGINEER	PFA/FEP
PATEL RUPIT JATINBHAI	ASSISTANT SUPERVISOR	PRODUCTION - FKM
HIRAPARA VARUN ASHOKBHAI	GRADUATE ENGINEER	PVDF
CHHATROLA R GANESHBHAI	ASST.SUPERVISOR	PFA/FEP
VISHAL D. JASOLIYA	ASSI.SUPERVISOR -	PVDF
MEET D VAGHELA	GRADUATE ENGINEER	ELECTRICAL
BRIJESH KUMAR	ASST.SUPERVISOR	POLYMER
MODI ASUTOSH RAMCHANDRA	GRADUATE ENGINEER	PTFE
CHOTALIYA MILAN KISHORBHAI	GRADUATE ENGINEER TRAINEE	ELECTRICAL
THAKOR AMARDIPSINH	TRAINEE OPERATOR	PTFE
MUNISH MAINRAI	ENGINEER - PTFE	PTFE

SAGAR NARESHBHAI G	ENGINEER	FKM
SHIR CHIRAG DILIPBHAI	GRADUATE ENGINEER	FKM PLANT
CHADDARWALA PARTH D	GRADUATE ENGINEER	FKM
SHIV KUMAR VERMA	SENIOR ENGINEER	FKM
NAGESH SINGH	ASST.SUPERVISOR	PFA/FEP
Gor Jigar Pankajkumar	ASST.SUPERVISOR	PFA/FEP
SANJAY V PATEL	PLANT OPERATOR (PROD.)	PVDF
ARAVIND KUMAR	ASS. SUPERVISOR -	PVDF
DILIPSINH JADEJA	CHIEF MANAGER - ADMIN	ADMIN
RAVAL SAURABH GIRISHKUMAR	GRADUATE ENGINEER	ELECTRICAL
MAKADIA B JITENDRABHAI	SR.ENGINEER	CMS
KHUNT BRIJESH HARSHADBHAI	GRADUATE ENGINEER	CMS PLANT
BAMBHANIYA HASMUKH PI	GRADUATE ENGINEER	CMS
NISHANT ANILBHAI RANA	GRADUATE ENGINEER	PFA/FEP PLANT
RAJ VISHVAJITSINH VIKRAMSINH	GRADUATE ENGINEER	D-PTFE PLANT
SONI DARSHANKUMAR P	GRADUATE ENGINEER	MECHANICAL - POLYMER
PATEL AKASH ARVINDBHAI	GRADUATE ENGINEER	MECHANICAL [CHEMICAL]
RANJEETKUMAR R YADAV	PLANT OPERATOR - PTFE	QA/QC
RAVIKUMAR D. PATEL	TECHNICIAN	APTFE
MACHHI VISHALKUMAR R	ENGINEER	MECHANICAL-PTFE
AMIT KUMAR VISHWAKARMA	ASST. SUPERVISOR	PFA/FEP
RAGHUVIRSINH K. SOLANKI	J. TECHNICIAN -	MECHANICAL-PTFE
DIPAK KUMAR VASAVA	SR.ENGINEER	PRODUCTION - FKM
RAJ RAJPALSINH RANJITSINH	ASST. SUPERVISOR	POLYMER
PATEL RUPIT JATINBHAI	ASSISTANT SUPERVISOR	PRODUCTION - FKM
CHIRAG M PATEL	SENIOR PLANT OPERATOR	PTPTFE
MIT DHARMESHBHAI PATEL	TRAINEE CHEMIST - QA/QC	QA/QC
MAHENDIALI PALSANIYA	TRAINEE CHEMIST - QA/QC	QA/QC
SINGH AAUSH BHARDWAJ PRABHAKAR	GRADUATE ENGINEER TRAINEE	VDF
Nirav Panchal	Senior Engineer	INSTRUMENT
RAJKUMAR CHAUDHARY	ASSISTANT SUPERVISOR - POLYMER [MILL OPERATIONS]	FKM - MILLING OPERATIONS
SHABHAN KHAN	PLANT OPERATOR -	FKM
SACHIN RANA	Jr.PLANT OPERATOR -	FKM
PATEL MITESHKUMAR HIMATLAL	OPERATIONS	PRODUCTION - FKM
SUDHIR KUMAR	ASS. SUPERVISOR -	FKM - MILLING
VISHAL PRAJAPATI	ASST. SUPERVISOR	MECHANICAL
NEEL PATEL	ENGINEER	PTFE
LAMBODAR PATRA	SENIOR OPERATOR	FKM
PADHIYAR NILESH JAGDISHBHAI	ASS. SUP.- PRODUCTION	PVDF
AKSHAY M. PRAJAPATI	JR. PLANT OPERATOR - POLYMER	PVDF

ANJAN	CHEMIST	DPTFE
HARDIK PATEL	Assistant Supervisor	PVDF
PRASHIL DESAI	CHEMIST	APTFE
JITENDRA M. MISTARY	Chemist	QA-QC
RAKESH PARMAR	SENIOR OPERATOR	UTILITY
SANJAY KUMAR	PLANT OPERATOR -	TFE-1
RANA HIREN A	S.ENGINEER - MECHANICAL	MECHANICAL
BRIJESH KUMAR	ASST.SUPERVISOR	POLYMER
KASHINATH JANA	ASST. SUPERVISOR	FKM
KHILJI ASHIF IKBAL	ASS. SUP. - PRODUCTION	FKM
NADIM KHAN	CHEMIST (QA/QC)	QA/QC - PTFE
DIPAK T. PATIL	SUPERVISOR	FKM
MUKESH L. CHAUDHARY	ENGINEER - PTFE	QA/QC - FKM LAB
ANKIT TRIPATHI	ASS. SUP. - PRODUCTION	FKM
SUMITKUMAR R. GADARA	PLANT OPERATOR -	FKM
ANKUSH KUMAR PIMPALE	OPERATOR	FKM
DHADUK JAYDIP MANSUKHBHAI	ASSI.SUP. - PRODUCTION	VDF
THADODA VAIBHAVKUMAR M	ASSI. SUP - PRODUCTION	VDF
VADAVIYA DHAVAL CHHAGAN	ASSI. SUP. - PRODUCTION	FKM
RANA RAHUL SATISHBHAI	ASSISTANT SUPERVISOR - PRODUCTION	TFE - 3
BARAD NAITIK KUMAR KANAJIBHAI	ASSISTANT SUPERVISOR - PRODUCTION	ProjecTS
JESADIYA HARSHIL RAMESHBHAI	ASSISTANT SUPERVISOR - PRODUCTION	PVDF
RAVAT MILANKUMAR RAMNIKLAL	ASST.SUPERVISOR	PVDF
JATIN KUMAR RANA	ASSISTANT SUPERVISOR	PVDF
SANKET PATEL	Assistant Supervisor	PVDF
ABHISHEK DHARMESHBHAI RANA	ASST. SUPERVISOR	PVDF
ACHARYA PARTHKUMAR BHARATBHAI	ENGINEER - PRODUCTION	PVDF
ATIT SHAH	ENGINEER	PVDF
DILEEP SINGH	SENIOR OPERATOR	PVDF
SANJAY KUMAR NAGAR	ASST. SUPERVISOR	PVDF
VAIBHAV GOPAL PATIL	SUPERVISOR - MECHNICAL DAHEJ- B	PVDF
DHRUV KUMAR MAHESHBHAI PATEL	ENGINEER - POLYMER	PVDF
PRAJAPATI HIRENKUMAR HASAMUKHBHAI	TRAINEE OPERATOR - POLYMER	PVDF

PATEL JAY NAROTTAMBHAI	GRADUATE ENGINEER	A&H PLANT
NIKUNJ BAMBHROLIYA	ASSISTANT SUPERVISOR	A&H
PATEL VRUSHANGKUMAR	ENGINEER	A&H
KAUSHIK CHAUHAN	ASST.SUPERVISOR	DAHEJ B
PATEL URVISHKUMAR SHASHIKANT	ASST. SUPERVISOR	DAHEJ B
MEGHVADA JAMSINH BALUBHAI	ASST. SUPERVISOR	DAHEJ B
JOTVA RAJDEEPBHAI DEVSIBHAI	ASST. SUPERVISOR	DAHEJ B
MAHESH CHANDRA	CHEMIST	Monomers (TFE-
HASRATALI M SAIYED	SENIOR CHEMIST - QA	Monomers (TFE-
PANDYA CHANKIKUMAR	ASSISTANT SUPERVISOR - PRODUCTION	TFE-3
RUSHIKESH S. HAZARE	Assistant supervisor -	FKM - MILLING
VAIBHAV GOPAL PATIL	SUPERVISOR - MECHNICAL DAHEJ- B	TFE - 3

ANNEXURE- 6
LIST OF FIRST AIDER

SR. NO.	NAME
1	PATIL VARSHA
2	SINDHA PRAGNESH
3	NAGAR SANJAY
4	SOLANKI JALAMJI
5	VERMA SHUBHAM
6	SHRIVASTAV BIPIN
7	LIMBACHIYA VIPUL
8	SURTI DHVANIL
9	PATEL VEDANT
10	PARMAR RAVINDRA
11	OJHA RAHUL
12	PARMAR SACHIN
13	CHAUDHARI DHANESH
14	PATEL BIPIN
15	PANCHAN SAILENDRA
16	MODI SRUJAL
17	MODI NEEL
18	PATEL NILESH
19	SUVALIYA JAYDEEP
20	MACHHI SHIVAM
21	PARMAR VINOD
22	PANKHANIYA HARDIK
23	PATEL KETAN
24	MEHTA MUKUND
25	PANSURIYA VINAYAK
26	PATEL VIRAL
27	CHANAWALA DIPAKKUMAR
28	TIWARI MANISH
29	PATEL PARESH
30	MALVANIYA SAGAR

ANNEXURE-R1/5

1627

GUJARAT POLLUTION CONTROL BOARD

PARYAVARAN BHAVAN, SECTOR 10-A,
GANDHINAGAR - 382010,
(T) 079-23232152

GPCB

BY R.P.A.D.

DIRECTION UNDER SECTION-31(A) OF THE AIR (PREVENTION AND CONTROL OF POLLUTION) ACT-1981 (HEREINAFTER REFERRED TO AS THE "AIR ACT") AS AMENDED FROM TIME TO TIME

WHEREAS you **M/s. Gujarat Fluorochemicals Limited** having an industrial plant at Plot No.: 12-A, E-50/1, Dahej GIDC Estate, Tal.:Vagra, Dist.: Bharuch.

AND WHEREAS you are having CCA No. AWH-129478 valid up to 15/02/2027 for manufacturing activity/operation of industrial plant subject to compliance of conditions mentioned in order of said CCA.

AND WHEREAS during the inspection of your industrial plant on 29/12/2024 by the authorized officer of the Board, it has been observed that:

(1) On 28/12/2024, gas leakage accident occurred in CMS- 1 plant of unit.
(2) Leakage occurred from isolation valve near auto valve XCV-2209 of CMS-1 plant leading to leakage of Crude CMS (Chloro Methane Substance). Crude CMS contains mixture of Chloroform, Methylene Dichloride and Carbon Tetrachloride.
(3) Crude CMS was emitted into atmosphere due to this accident and as per the CCTV footages gaseous cloud was seen for approximately 15 minutes.
(4) The cloud of the gas was formed in the entire CMS-1 plant area, Control Room area and further dispersed in the plant area as informed.
(5) Due to this Gas leakage accident, 04 persons were died and 02 persons were injured (under observation). (As per latest information).
(6) At the time of inspection the isolation valve (near auto valve XCV2209) found damaged and bonnet found displaced.
(7) Unit has not adopted adequate safety measures.

AND WHEREAS the non-compliances found during the inspection seems severe and may damage environment adversely.

AND WHEREAS Director Industrial Safety and Health (DISH), Bharuch office has issued prohibitory order for manufacturing activity inCMS-1 plant of the unit.

UNDER THE CIRCUMSTANCES, as directed, I M. R. Macwana, Unit Head-Bharuch, Gujarat Pollution Control Board issue the directions under Section 31-A of the Air Act – 1981 as under:

(1) Unit shall not use/operate CMS-1 plant before obtaining revocation the Board.
(2) To take all necessary measures to safely remove all remaining in-process material/ intermediate materials considering requisite process safety aspects.
(3) To ensure safe collection of residues of chemicals / hazardous & other wastes generated from accident and dispose the same as per provisions of the HOWM Rules-2016 under intimation to the Board.

Outward No: 860091, 03/01/2025

(4) To take all necessary measures to ensure safety of all reactors, equipment etc. to prevent further mishappening and environmental damage.

(5) To carry out safety audit/ HAZOP study and root cause analysis for accident that shall include environment aspects at the earliest and submit the same to the Board.

(6) To submit compliance report of the instructions/directions issued by DISH w.r.t. accident, if any.

(7) Unit shall pay Rs. 1 Crore (Rupees One Crore only) as Interim Environment Damage Compensation (EDC)immediately through XGN portal.

(8) To submit Bank guarantee of Rs. 10 Lac (Rupees ten laconly) for compliance assurance at the time of revocation.

Non-compliance or violation of the aforementioned direction/order will constrain this Board to initiate action as per provision of Section- 37 of the Air (Prevention and Control of Pollution) Act-1981 and amendment thereof.

If you are aggrieved by the aforesaid direction, you may file an appeal under Section 31 of the Air (Prevention and Control of Pollution) Act, 1981 before Appellate Authority (Forests & Environment Department, Government of Gujarat) within thirty days from the date of this order.

This order is issued with the approval of competent authority of the Board.

FOR AND ON BEHALF OF
GUJARAT POLLUTION CONTROL BOARD

(M. R. MACWANA)
UNIT HEAD

NO: GPCB/BRCH/CCA-1080(25)/ID-15136/ **Date: /01/2025**

Issued to:

M/s. Gujarat Fluorochemicals Limited
Plot No.: 12-A, E-50/1, Dahej GIDC Estate,
Tal.:Vagra, Dist.: Bharuch

Copy To:

- **Regional Officer,**
  Gujarat Pollution Control Board,
  Regional Office, Bharuch..... for monitoring & verification.

Outward No:850291, Dt:01/01/2025

ANNEXURE-R1/6

1629

GUJARAT POLLUTION CONTROL BOARD

PARYAVARAN BHAVAN, SECTOR 10-A,
GANDHINAGAR - 382010,
(T) 079-23232152

GPCB

BY R.P.A.D.

REVOCATION OF UNDER SECTION - 31(A) OF THE AIR (PREVENTION AND CONTROL OF POLLUTION) ACT-1981

WHEREAS you M/s. **Gujarat Fluorochemicals Limited** are having an industrial plant situated at Plot No. 12/A, E-50/1, Dahej GIDC Industrial Estate, Tal. Vagra, Dist. Bharuch.

AND WHEREAS Gujarat Pollution Control Board has granted CCA valid up to 15/02/2027 for manufacturing activity subject to compliance of conditions mentioned therein.

AND WHEREAS GPCB has issued direction under section-31(A) of the Air Act-1981 for the closure of CMS Plant-1 of your industrial plant vide letter no. GPCB/BRCH/CCA-1080(25)/ID-15136/850291 dated 03/01/2025.

AND WHEREAS you have submitted notarized undertaking dated 10/01/2025 ensuring that you have complied directions issued to you by the Board and also will comply CCA conditions.

AND WHERES you have submitted bank guarantee worth Rs. 10,00,000/- of ICICI Bank valid up to 31/03/2026 for compliance assurance.

AND WHEREAS authorized officer of the board has inspected your industry on **16/01/2025** and observed that:

1) During visit, CMS-1 Plant of the unit is not in operation as issued closure direction. No any gas leakages are observed from the plant.
2) Unit has replaced the insolation valve near auto valve XCV-2209 of the CMS-1 Plant, where earlier gas leakage incident was occurred.
3) During visit, no any gas leakages & gaseous cloud are observed from the entire CMS-1 plant area & control room area.
4) Unit has removed the damaged valve and replaced the new insolation valve near auto valve XCV-2209 of the CMS-1 Plant.
5) Unit has submitted HAZOP study carried out by M/s. HSE Risk Management Services Pvt. Ltd As per notarized undertaking dated 10.01.2025, they will be implemented recommendations of HAZOP study for adequate safety measures.

AND WHEREAS DISH has Lifted Direction vide letter Dated: 13/01/2025.

AND WHEREAS you have paid interim Environment Damage Compensation (EDC) of Rs. 1 Crore to the Board.

Under the circumstances, I M.R. Macwana, Unit Head - Bharuch, Gujarat Pollution Control Board is directed to revoke the direction issued to CMS Plant-1 of your industrial

Outward No: 8148017/01/2025

plant vide letter no. GPCB/BRCH/CCA-1080(25)/ID-15136/850291 dated 03/01/2025 **FOR 3 MONTHS** with following condition:

1) Unit shall comply conditions of CCA.
   This order is issued after obtaining approval from competent authority of the Board.

FOR AND ON BEHALF OF
GUJARAT POLLUTION CONTROL BOARD,

(M.R. MACWANA)
UNIT HEAD

NO: GPCB/BRCH/CCA-1080(25)/ID: 15136/ **Date: /01/2025**

Issued to:
M/s. Gujarat Fluorochemicals Limited
Plot No. 12-A, E-50/1, Dahej GIDC Estate,
Tal. Vagra, Dist. Bharuch.

Copy to:
The Regional Officer,
Regional Office,
Gujarat pollution Control Board,
Bharuch..... to follow up for compliance of this direction & send IR/AR.

Outward No:851480,17/01/2025

ANNEXURE-R1/7

1631

GUJARAT FLUOROCHEMICALS
VALUE THROUGH GREEN CHEMISTRY
An INOXGFL Group Company
CIN : L24304GJ2018PLC105479

Gujarat Fluorochemicals Limited
earlier known as Inox Fluorochemicals Limited

12/A, GIDC Dahej Industrial Estate, Taluka Vagra, Distt. Bharuch-392130, Gujarat, India | Tel: +91-2641-618031 (Admin) / 618041-50 (Purchase) / 618086-87 (Security) | www.gfl.co.in

To,
Mrs. Sejalben Rajeshkumar Magnadia
B-21, Dhanish Park,
Near Trimuti Hall
Shaktinath
Bharuch

Date : 15th January-2025

Sub : Written assurance for mutually agreed decisions taken on 28th December-2024

Dear Mrs. Sejalben,

With reference to the discussions held with you and other family members on 28/12/2024 for the assurance to provide job to your son Kush Rajeshkumar Magnadia, we are herewith giving following in writing;

1. Kush Maganadia has enrolled him self in BE – Chemical course with Parul university, Vadodara, so after successful completion of his BE, we will offer him suitable job based on company's criteria.
2. As we understood from discussion that, Kush Magnadia has already completed Diploma in Chemical and pursuing BE- Chemical as of now, In such conditions, we leave decision on you that whether Kush Magnadia wants to accept the offer for the job based on Diploma Chemical **OR** after completion of BE- Chemical.
3. As committed by the GFL management, We will reimburse remaining college fees to Kush Rajeshkumar Magandia for which we request you to give us advance intimation for fees **OR** receipt of fees paid to college from time to time for its reimbursement.
4. Apart from college fees, GFL management will also reimburse transportation charges towards commuting to Parul University, Vadodara for remaining years of college. For the 4th year it could be Rs. 4200/- per month and 5th Year it would be Rs 4500/- per month Maximum.

With this letter GFL Parivar wanted to assure you that, the GFL management is committed for above mutually agreed decisions.

For Gujarat Fluorochemical Ltd.

Sanath kumar Muppirala
Executive President (O)

Dr Sunil Bhatt
Head -Regional Human Resources GFL Business

I read and understood the above and give our acceptance.

S. R. Magnadia

Sejalben Rajeshkumar Magnadia
W/O Late Shri Rajeshkumar Magnadia

GUJARAT FLUOROCHEMICALS
VALUE THROUGH GREEN CHEMISTRY
An INOXGFL Group Company
CIN : L24304GJ2018PLC105479

Gujarat Fluorochemicals Limited
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Date: 14/02/2025

To,
The Commissioner for Workmen compensation
Labour court,
Bharuch

SUB: - Depositing of claim amount in respect of Late Shri **Magnadia Rajeshkumar Sureshchandra**

Enclosed herewith please find the following documents i.r.o. depositing of claim amount of out deceased employee Late **Magnadia Rajeshkumar Sureshchandra**

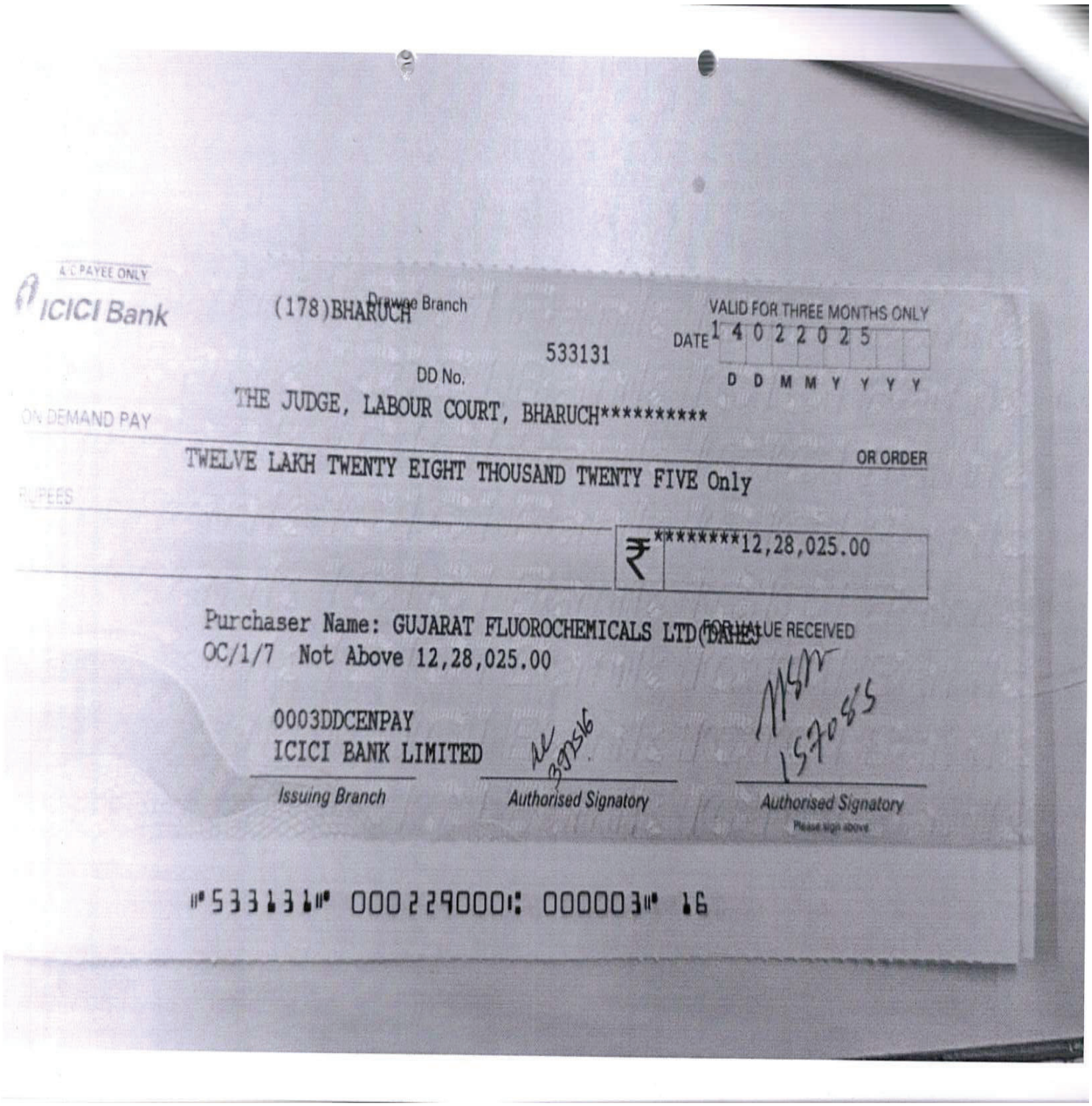
1. Form A (in two copies)
2. Demand Draft no. 533131, Dated 14/02/2025, amounting to Rs. **12,28,025/-** Twelve lakh twenty-eight thousand and twenty-five rupees only, (drawn in favour of **"The Judge Labour Court, Bharuch".**
3. Computation of Claim Amount
4. Details of name & address of family members of deceased employee.
5. Copy of Death certificate
6. Proof of Date of Birth
7. No Objection Certificate
8. Inquest Panchnama and PM report

Kindly receive the above in order & do the needful.

Thanking you,
Yours truly,
Gujarat Fluorochemicals Limited.,

Authorised Signatory.

Superintendent
Labour Court, Bharuch



A/C PAYEE ONLY

ICICI Bank

(178)BHARUCH Drawee Branch

VALID FOR THREE MONTHS ONLY

DATE 1 4 0 2 2 0 2 5
D D M M Y Y Y Y

533131
DD No.

THE JUDGE, LABOUR COURT, BHARUCH**********

ON DEMAND PAY

OR ORDER

TWELVE LAKH TWENTY EIGHT THOUSAND TWENTY FIVE Only

RUPEES

₹ ********12,28,025.00

Purchaser Name: GUJARAT FLUOROCHEMICALS LTD(DAHEJ)

FOR VALUE RECEIVED

OC/1/7 Not Above 12,28,025.00

0003DDCENPAY
ICICI BANK LIMITED

Issuing Branch

Authorised Signatory

Authorised Signatory
Please sign above

⑈533131⑈ 000229000⑆ 000003⑈ 16

GUJARAT FLUOROCHEMICALS
VALUE THROUGH GREEN CHEMISTRY
An INOXGFL Group Company
CIN : L24304GJ2018PLC105479

Gujarat Fluorochemicals Limited
earlier known as Inox Fluorochemicals Limited

12/A, GIDC Dahej Industrial Estate, Taluka Vagra, Distt. Bharuch-392130, Gujarat, India | Tel: +91-2641-618031 (Admin) / 618041-50 (Purchase) / 618086-87 (Security) | www.gfl.co.in

FORM A

[See rule 6 (1)]

DEPOSIT OF COMPENSATION FOR FATAL ACCIDENT
(Section 8(1) of the Workmen's Compensation Act, 1923)

Compensation amounting to **Rs, 12,28,025=00** is hereby presented for deposit in respect of injuries resulting in the death of the workman, whose particulars are given below, which occurred on .

Name of Employee: Magnadia Rajeshkumar Sureshchandra
Father's Name: Magnadia Sureshchandra
(Husband's name in case of married woman and widow.)
Cast: Hindu
Local address: B/21, Dhanish Park Society, Nr. Trimurti Hall, Shaktinath, Bharuch.

Permanent address: - As above

His / Her monthly wages are estimated at **Rs 15000/-** He was over the age of 47 years at the time of his death.

2. The said workman had, prior to the date of his death, received the following payments, namely:

The said workman joined on 01st August,2019 and accident happened on 28th December, 2024. His daily wage is calculated at **Rs. 577/-**. Amounting to average monthly salary of **Rs. 15,000/-**.

3. An advance of Rs. NIL has been made on account of compensation to being his / her dependant.
4. *I do not/desire to be made a party to the proceedings for distribution of the aforesaid compensation.

Dated – 14/02/2025

Employer

* An employer desiring to be made a party to the proceedings should strike out the words "do not".

GFL
GUJARAT FLUOROCHEMICALS
VALUE THROUGH GREEN CHEMISTRY
An INOX GFL Group Company
CIN : L24304GJ2018PLC105479

Gujarat Fluorochemicals Limited
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COMPUTATION OF CLAIM AMOUNT

Name of the deceased person: Late Magnadia Rajeshkumar Sureshchandra

Age as on date of Death: - 47 years

Relevant Factor: - 163.07

Average Salary: - Rs. 15,000/-

Compensation Amount: - Fifty percent of Average salary * Relevant factor

Funereal Charges – 5000/-

i.e., 15,000/2* 163.07 = 12,23,025 + 5,000 (Funeral Expense) = RS. 12,28,025/- (Twelve lakhs twenty-eight thousand & twenty-five rupees only).

GUJARAT FLUOROCHEMICALS
VALUE THROUGH GREEN CHEMISTRY
An INOX GFL Group Company
CIN : L24304GJ2018PLC105479

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Date: 14/02/2025

Details of name & address of family members of deceased employee.

1. Sejalben Rajeshkumar Magnadia – Age :46 (Deceased Wife)
2. Kush Rajeshkumar Magnadia – Age :21 (Deceased Son)
3. Isha Rajeshkumar Magnadia – Age :14 (Deceased Daughter)
4. Sureshchandra Keshav Lal Magnadia – Age :78 (Deceased Father)
5. Bhartiben Sureshchandra Magnadia - Age :76 (Deceased Mother)

GUJARAT FLUOROCHEMICALS
VALUE THROUGH GREEN CHEMISTRY
An INOXGFL Group Company
CIN : L24304GJ2018PLC105479

Gujarat Fluorochemicals Limited
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Tel: +91-2641-618031 (Admin) / 618041-50 (Purchase) / 618086-87 (Security) | www.gfl.co.in

Date: 14/02/2025

NO OBJECTION CERTIFICATE

This is to certify that **Late Shri Magnadia Rajeshkumar Sureshchandra** met with an accident on 28/12/2024, resulting in his death.

This accident took place in course of his employment while discharging his duties. Claim amount of Rs. 12,28,025/- (Twelve lakhs twenty-eight thousand & twenty-five rupees) is due & payable to him & the same has been deposited by us in the Labour court at Bharuch.

We have NO OBJECTION if the claim amount is paid by the court to the deceased's legal heirs & we do not want to be a party to the claim distribution.

In case of claim amount likely to increased or decreased, we humbly request you to intimate us for the necessary action from our end.

1638

FALGUNI P. BAROT
Advocate & Notary
903, Sai Heights,
ABC Chokdi, Nr. Rohini Nagar,
Bholav, Tal. & Dist. BHARUCH-392015
Mob.: 9427879410, 9574155330

20 JAN 2025

IN-GJ40443008212168X

INDIA NON JUDICIAL

Government of Gujarat

सत्यमेव जयते

Certificate of Stamp Duty

FALGUNI P. BAROT
NOTARY BHARUCH (GUJ.)
Reg. No. 18266
Date 20 JAN 2025
Sr. No. 79/2025
My Commission Expires on Date 10-2-2025

Certificate No.	:	IN-GJ40443008212168X
Certificate Issued Date	:	20-Jan-2025 03:17 PM
Account Reference	:	IMPACC (AC)/ gj13244011/ BHARUCH/ GJ-BH
Unique Doc. Reference	:	SUBIN-GJGJ13244011930743858515 82X
Purchased by	:	PRASHANT JADAV
Description of Document	:	Article 5(h) Agreement (not otherwise provided for)
Description	:	SAMAJUTI KARAR
Consideration Price (Rs.)	:	0 (Zero)
First Party	:	GUJARAT FLUOROCHEMICALS LTD
Second Party	:	MAGNADIA SEJALBEN RAJESHKUMAR
Stamp Duty Paid By	:	GUJARAT FLUOROCHEMICALS LTD
Stamp Duty Amount(Rs.)	:	300 (Three Hundred only)

NOTARY
FALGUNIBEN P.BAROT
BHARUCH DISTRICT
GUJARAT STATE
REGD. No.18266
EXPIRY DATE
10/02/2025
GOVT. OF INDIA

FALGUNI P. BAROT
BHARUCH

HF 0028114222

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1. The authenticity of this Stamp certificate should be verified at 'www.shcilestamp.com' or using e-Stamp Mobile App of Stock Holding. Any discrepancy in the details on this Certificate and as available on the website / Mobile App renders it invalid.
2. The onus of checking the legitimacy is on the users of the certificate.
3. In case of any discrepancy please inform the Competent Authority.

GUJARAT FLUOROCHEMICALS LTD GUJARAT FLUOROCHEMICALS LTD GUJARAT FLUOROCHEMICALS LTD GUJARAT FLUOROCHEMICALS LTD GUJARAT FLUOROCHEMICALS LTD



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- Any alteration to this certificate renders it invalid and would constitute a criminal offence.
- Kindly contact Stock Holding Branch / Centre in case of discrepancy.
- For information related to e-Stamping you may write to us on our email id estamp.ahmedabad@stockholding.com or visit our Branch/Centre.

સૂચના

- આ ઈ-સ્ટેમ્પ પ્રમાણપત્રની વિગતો www.shcilestamp.com દ્વારા અથવા સ્ટોક હોલ્ડિંગની "ઈસ્ટેમ્પિંગ" મોબાઈલ એપ્લિકેશન અથવા સ્ટોક હોલ્ડિંગની શાખા / કેન્દ્ર (જેની વિગતો www.stockholding.com પર ઉપલબ્ધ છે) પર જઈ ને ચકાસી શકાય છે.
- આ પ્રમાણપત્રમાં કરેલ કોઈપણ ફેરફાર અમાન્ય છે અને તે ફોજદારી ગુનો બને છે.
- આ ઈ-સ્ટેમ્પ પ્રમાણપત્રમાં કોઈપણ વિસંગતતા જણાય તો સ્ટોક હોલ્ડિંગની શાખા / કેન્દ્ર પર સંપર્ક કરવો.
- ઈ-સ્ટેમ્પિંગ સંબધિત જાણકારી માટે અમને estamp.ahmedabad@stockholding.com પર ઈ-મેઈલ કરવો અથવા અમારી શાખા / કેન્દ્ર ની મુલાકાત લેવી.

સમજૂતી કરાર

તા. 28/12/2024 ના રોજ આકસ્મિક થયેલ અકસ્માતમાં શ્રી મગણાદીઆ રાજેશકુમાર સુરેશચંદ્ર કે જેઓ ગુજરાત ફ્લુરોકેમિકલ્સ લિમિટેડ- અ , દહેજ યુનિટમાં, લીડ ઓપરેટર - યુટીલીટી તરીકે ફરજ બજાવતા હતા. તેઓ બીજી પાળીમાં ફરજ પર હાજર હતા અને તેઓ નું આકસ્મિક અકસ્માતના કારણે મૃત્યુ પામેલ છે.

ઉપરોક્ત વધારાનું ચુકવણું ઉપરાંત માનવતાના ધોરણે મૃતકના પત્ની / કાયદેસરના વારસદાર ને રૂ: 40,00,000/- (અંકે રૂપિયા ચાલીસ લાખ પુરા) નો આઈ.સી .આઈ .સી આઈ બેંક નો તારીખ 03/01/2025 નો ડી.ડી નંબર : 534900 તારીખ 04/01/2025 ના રોજ ચૂકવી આપવામાં આવેલ છે.

ઉપરોક્ત ચુકવણા થયે થી કામદાર ના આકસ્મિક અકસ્માતના મૃત્યુ થયેલ પરત્વે કોઈ હકક, તકરાર કે વિવાદ બાકી રહેતો નથી અને તે અંગે આ લખાણ પક્ષકારો આજરોજ તા:20/01/2025 ના રોજ કરેલ છે.



સેજલ રાજેશકુમાર મગણાદીઆ : S. R. Magnadia

(સ્વર્ગીય શ્રી મગણાદીઆ રાજેશકુમાર સુરેશચંદ્ર ના ધર્મપત્ની / વારસદાર)

સાક્ષી :

1. નામ: કિરણ રમેશ બારોટ KRB KRB — સહી:

2. નામ: પ્રકાશ ચાવડા — સહી :

બીડાણ : રૂપિયા 40,00,000/- ડીડીની ફોટોકોપી.

NOTARY FALGUNIBEN P.BAROT BHARUCH DISTRICT OF GUJARAT STATE REGD. No.18266 EXPIRY DATE 10/02/2025 GOVT. OF INDIA

NOTARY Falguni P. Barot BHARUCH DISTRICT Guj. State Reg. No. 18266 GOVT. OF INDIA

REGISTERED
Falguni
FALGUNI P. BAROT
ADVOCATE & NOTARY
GOVT. OF INDIA
BHARUCH DISTRICT (GUJARAT)
Sr. No.79/2025...Dt.20/01/2025
My Commission Expires on Dt. 10/02/2025

BEFORE ME
Falguni
(Falguni P. Barot)
ADVOCATE & NOTARY
Govt. of India
Bharuch District (Gujarat)
20 JAN 2025

A/C PAYEE ONLY

ICICI Bank

(178) BHARUCH e Branch

534900

DATE 0 3 0 1 2 0 2 5
D D M M Y Y Y Y

VALID FOR THREE MONTHS ONLY

DD No.

MAGNADIA SEJALBEN RAJESHKUMAR**********

ON DEMAND PAY FORTY LAKH Only OR ORDER

RUPEES ₹ *********40,00,000.00

Purchaser Name: GUJARAT FLUOROCHEMICALS LTD(BANEVALUE RECEIVED
OC/4/7 Not Above 40,00,000.00

0003DDCENPAY
ICICI BANK LIMITED

Issuing Branch

Authorised Signatory

Authorised Signatory

⑈534900⑈ 000229000⑆ 000003⑈ 16

NOTARY
FALGUNIBEN P.BAROT
BHARUCH DISTRICT
OF GUJARAT STATE
REGD. No.18266
EXPIRY DATE
10/02/2025
GOVT. OF INDIA



1642

ભારત સરકાર
Government of India

આધાર

મારા આધાર, મારી ઓળખ

NOTARY
FALGUNIBEN P.BAROT
BHARUCH DISTRICT
OF GUJARAT STATE
REGD. No.18266
EXPIRY DATE
10/02/2025
GOVT. OF INDIA

ભારતીય વિશિષ્ટ ઓળખાણ પ્રાધિકરણ
Unique Identification Authority of India

આધાર

1947

GUJARAT FLUOROCHEMICALS
VALUE THROUGH GREEN CHEMISTRY
An INOXGFL Group Company
CIN : L24304GJ2018PLC105479

Gujarat Fluorochemicals Limited
earlier known as Inox Fluorochemicals Limited

12/A, GIDC Dahej Industrial Estate, Taluka Vagra, Distt. Bharuch-392130, Gujarat, India
Tel: +91-2641-618031 (Admin) / 618041-50 (Purchase) / 618086-87 (Security) | www.gfl.co.in

Date: 14/02/2025

To,
The Commissioner for Workmen compensation
Labour court,
Bharuch

SUB: - Depositing of claim amount in respect of Late Shri **Mundrika Yadav S/O Thakur Prasad Yadav**

Enclosed herewith please find the following documents i.r.o. depositing of claim amount of out deceased employee Late Shri **Mundrika Yadav S/O Thakur Prasad Yadav working under contract of M/S. Leo Coats (India) Pvt. Ltd.**

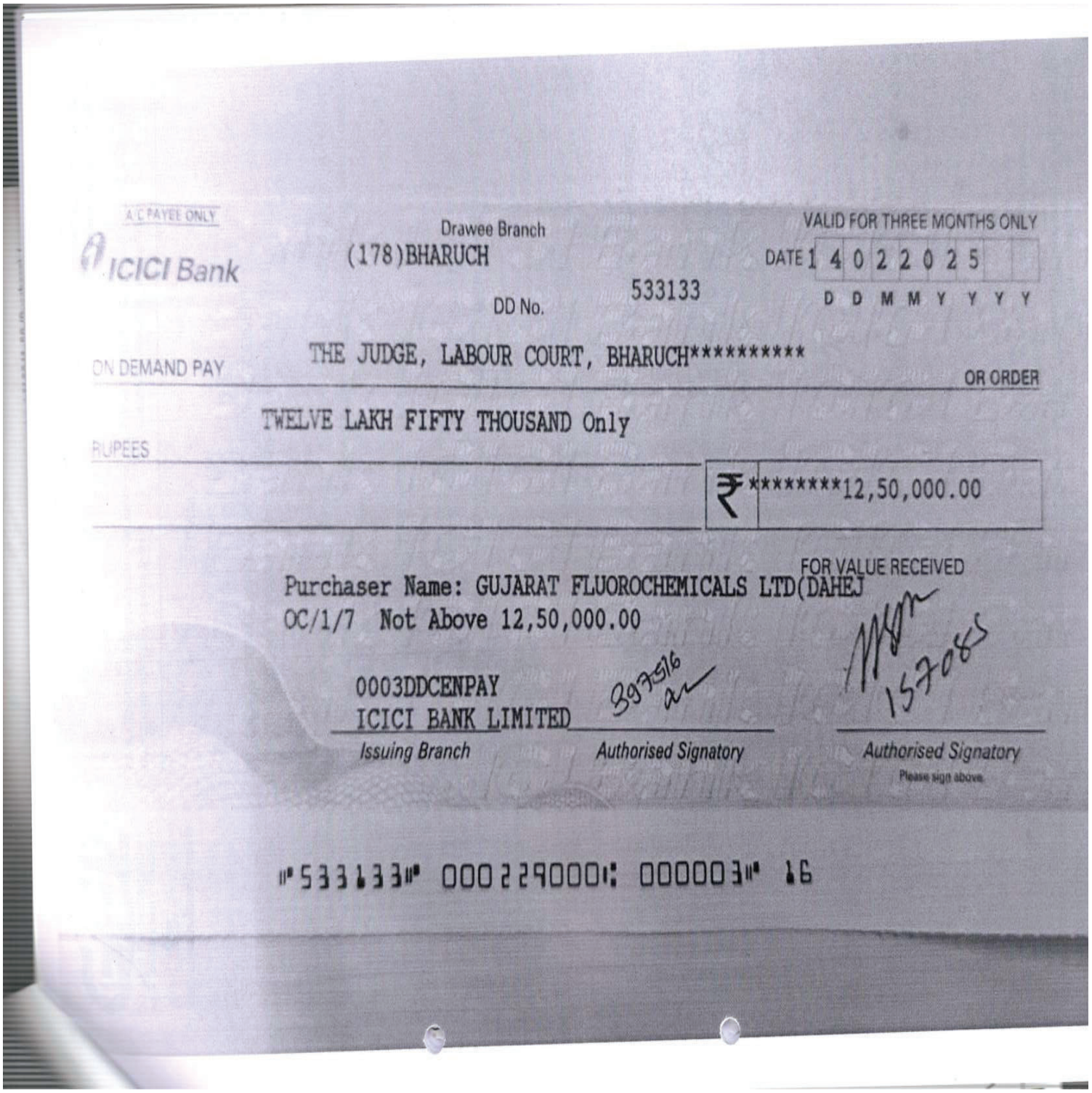
1. Form A (in two copies)
2. Demand Draft no. 533133, Dated 14/02/2025, amounting to Rs. **12,50,000/-** (Twelve Lakhs Fifty thousand only), drawn in favour of **"The Judge Labour Court, Bharuch".**
3. Computation of Claim Amount
4. Details of name & address of family members of deceased employee.
5. Copy of Death certificate
6. Proof of Date of Birth
7. No Objection Certificate
8. Inquest Panchnama and PM report

Kindly receive the above in order & do the needful.

Thanking you,
Yours truly,
Gujarat Fluorochemicals Limited.,

Authorised Signatory.

Superintendent
Labour Court, Bharuch



A/C PAYEE ONLY

ICICI Bank

Drawee Branch
(178)BHARUCH

VALID FOR THREE MONTHS ONLY

DATE 1 4 0 2 2 0 2 5
D D M M Y Y Y Y

DD No. 533133

ON DEMAND PAY THE JUDGE, LABOUR COURT, BHARUCH********** OR ORDER

TWELVE LAKH FIFTY THOUSAND Only

RUPEES

₹ ********12,50,000.00

FOR VALUE RECEIVED

Purchaser Name: GUJARAT FLUOROCHEMICALS LTD(DAHEJ
OC/1/7 Not Above 12,50,000.00

0003DDCENPAY
ICICI BANK LIMITED

Issuing Branch

Authorised Signatory

Authorised Signatory
Please sign above

"533133" 000229000: 000003" 16

GUJARAT FLUOROCHEMICALS
VALUE THROUGH GREEN CHEMISTRY
An INOXGFL Group Company
CIN : L24304GJ2018PLC105479

Gujarat Fluorochemicals Limited
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12/A, GIDC Dahej Industrial Estate, Taluka Vagra, Distt. Bharuch-392130, Gujarat, India | Tel: +91-2641-618031 (Admin) / 618041-50 (Purchase) / 618086-87 (Security) | www.gfl.co.in

FORM A
[See rule 6 (1)]

DEPOSIT OF COMPENSATION FOR FATAL ACCIDENT
(Section 8(1) of the Workmen's Compensation Act, 1923)

Compensation amounting to Rs, 13,58,984=00 is hereby presented for deposit in respect of injuries resulting in the death of the workman, whose particulars are given below, which occurred on .

Name of Employee: Mundrika Yadav S/O Thakur Prasad Yadav
Father's Name: Thakur Prasad Yadav
(Husband's name in case of married woman and widow.)
Cast: Hindu
Local address: Gram: Baitari, Post: Amrora, Kharundhi, Garhwa, Jharkhand - 822112

Permanent address: - As above

His / Her monthly wages are estimated at Rs 12,900 /- He was over the age of 29 years at the time of his death.

2. The said workman had, prior to the date of his death, received the following payments, namely:

The said workman joined on 24th December,2024 under contract of M/S. Leo Coats (India) Pvt. Ltd. and accident happened on 28th December, 2024. His daily wage is calculated at Rs. 497/-. Amounting to average monthly salary of Rs. 12,900/-.

3. An advance of Rs. NIL has been made on account of compensation to being his / her dependant.
4. *I do not/desire to be made a party to the proceedings for distribution of the aforesaid compensation.

Dated – 14/02/2025

Employer

* An employer desiring to be made a party to the proceedings should strike out the words "do not".

GUJARAT FLUOROCHEMICALS
VALUE THROUGH GREEN CHEMISTRY
An INOX GFL Group Company
CIN : L24304GJ2018PLC105479

Gujarat Fluorochemicals Limited
earlier known as Inox Fluorochemicals Limited

12/A, GIDC Dahej Industrial Estate, Taluka Vagra, Distt. Bharuch-392130, Gujarat, India | Tel: +91-2641-618031 (Admin) / 618041-50 (Purchase) / 618086-87 (Security) | www.gfl.co.in

COMPUTATION OF CLAIM AMOUNT

Name of the deceased person: Late Mundrika Yadav S/O Thakur Prasad yadav

Age as on date of Death: - 29 years

Relevant Factor: - 209.92

Average Salary: - Rs. 12,900/-

Compensation Amount: - Fifty percent of Average salary * Relevant factor

Funereal Charges – 5000/-

i.e., 12,900/2* 209.92 = 13,53,984 + 5,000 (Funeral Expense) = RS. 13,58,984/- (Thirteen lakhs fifty-eight thousand nine hundred & eighty-four rupees only)

Gujarat Fluorochemicals Limited
earlier known as Inox Fluorochemicals Limited

12/A, GIDC Dahej Industrial Estate, Taluka Vagra,
Distt. Bharuch-392130, Gujarat, India

Tel: +91-2641-618031 (Admin) / 618041-50 (Purchase) /
618086-87 (Security) | www.gfl.co.in

An INOXGFL Group Company
CIN : L24304GJ2018PLC105479

Date: 14/02/2025

Details of name & address of family members of deceased employee.

1. Asha Devi W/O Late Shri Mundrika Yadav – Age :25 (Deceased Spouse)

GUJARAT FLUOROCHEMICALS
VALUE THROUGH GREEN CHEMISTRY
An INOXGFL Group Company
CIN : L24304GJ2018PLC105479

Gujarat Fluorochemicals Limited
earlier known as Inox Fluorochemicals Limited

12/A, GIDC Dahej Industrial Estate, Taluka Vagra, Distt. Bharuch-392130, Gujarat, India

Tel: +91-2641-618031 (Admin) / 618041-50 (Purchase) / 618086-87 (Security) | www.gfl.co.in

Date: 14/02/2025

NO OBJECTION CERTIFICATE

This is to certify that **Late Shri Mundrika Yadav S/O Thakur Prasad Yadav** met with an accident on 28/12/2024, resulting in his death.

This accident took place in course of his employment while discharging his duties. Claim amount of Rs. **13,58,984/- (Thirteen lakhs fifty-eight thousand nine hundred & eighty-four rupees only)** is due & payable to him & the same has been deposited by us in the Labour court at Bharuch.

We have NO OBJECTION if the claim amount is paid by the court to the deceased's legal heirs & we do not want to be a party to the claim distribution.

We are herewith depositing amount of Rs. 12,50,000/- as a lumpsum compensation & remaining compensation amount will be deposited as ordered by the Hon'ble court in due course of time.

FALGUNI P. BAROT
Advocate & Notary
903, Sai Heights,
ABC Chokdi, Nr. Rohini Nagar,
Bholav, Tal. & Dist. BHARUCH-392015
Mob.: 9427879[illegible]6330

21 JAN 2025

IN-GJ41261031639552X

1649

INDIA NON JUDICIAL

Government of Gujarat

Certificate of Stamp Duty

सत्यमेव जयते

FALGUNI P. BAROT
NOTARY BHARUCH (GUJ.)
Reg. No. 18266
Date 21 JAN 2025
Sr. No. 83/2025
My Commission Expires on Date 10-[illegible]

Certificate No.	:	IN-GJ41261031639552X
Certificate Issued Date	:	21-Jan-2025 03:28 PM
Account Reference	:	IMPACC (AC)/ gj13244011/ BHARUCH/ GJ-BH
Unique Doc. Reference	:	SUBIN-GJGJ13244011946767422845 59X
Purchased by	:	PRASHANT JADAV
Description of Document	:	Article 5(h) Agreement (not otherwise provided for)
Description	:	SAMJUTI KARAR
Consideration Price (Rs.)	:	0 (Zero)
First Party	:	GUJARAT FLUOROCHEMICALS LTD
Second Party	:	ASHA DEVI
Stamp Duty Paid By	:	GUJARAT FLUOROCHEMICALS LTD
Stamp Duty Amount(Rs.)	:	300 (Three Hundred only)

NOTARY
FALGUNIBEN P.BAROT
BHARUCH DISTRICT
OF GUJARAT STATE
REGD. No.18266
EXPIRY DATE
10/02/2025
GOVT OF INDIA

FALGUNI P. BAROT
BHARUCH

HF 0028114230

Statutory Alert:
1. The authenticity of this Stamp certificate should be verified at 'www.shcilestamp.com' or using e-Stamp Mobile App of Stock Holding. Any discrepancy in the details on this Certificate and as available on the website / Mobile App renders it invalid.
2. The onus of checking the legitimacy is on the users of the certificate.
3. In case of any discrepancy please inform the Competent Authority.

GUJARAT FLUOROCHEMICALS LTD GUJARAT FLUOROCHEMICALS LTD GUJARAT FLUOROCHEMICALS LTD GUJARAT FLUOROCHEMICALS LTD GUJARAT FLUOROCHEMICALS LTD

1650





NOTICE

- The contents of this e-stamp certificate can be verified at www.shcilestamp.com, Stock Holding mobile application "EStamping" or at Stock Holding Branch/ Centre (the details of which are available at www.stockholding.com).
- Any alteration to this certificate renders it invalid and would constitute a criminal offence.
- Kindly contact Stock Holding Branch / Centre in case of discrepancy.
- For information related to e-Stamping you may write to us on our email id estamp.ahmedabad@stockholding.com or visit our Branch/Centre.

સૂચના

- આ ઈ-સ્ટેમ્પ પ્રમાણપત્રની વિગતો www.shcilestamp.com દ્વારા અથવા સ્ટોક હોલ્ડિંગની "ઈસ્ટેમ્પિંગ" મોબાઈલ એપ્લિકેશન અથવા સ્ટોક હોલ્ડિંગની શાખા / કેન્દ્ર (જેની વિગતો www.stockholding.com પર ઉપલબ્ધ છે) પર જઈ ને ચકાસી શકાય છે.
- આ પ્રમાણપત્રમાં કરેલ કોઈપણ ફેરફાર અમાન્ય છે અને તે ફોજદારી ગુનો બને છે.
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- ઈ-સ્ટેમ્પિંગ સંબધિત જાણકારી માટે અમને estamp.ahmedabad@stockholding.com પર ઈ-મેઈલ કરવો અથવા અમારી શાખા / કેન્દ્ર ની મુલાકાત લેવી.

समझौता ज्ञापन

तारीख २८/१२/२०२४ को आकस्मिक दुर्घटना में श्री मुंद्रिका यादव सन ऑफ़ ठाकुर प्रसाद यादव जो गुजरात फ्लोरोकेमिकल्स लिमिटेड-ए, दहेज यूनिट के अंडर मेसर्स लियो कोट इंडिया प्राइवेट लिमिटेड में कार्यरत थे। वह दूसरी पाली में ड्यूटी पर थे और आकस्मिक दुर्घटना के कारण उनकी मृत्यु हो गई।

उपरोक्त अतिरिक्त भुगतान के अलावा, आईसीआई बैंक दिनांक २०/०१/२०२५ डीडी संख्या: ५३४९२८ रुपये: ४०,००,००० /- (चालीस लाख रुपये पूर्ण) का भुगतान मानवीय आधार पर मृतक की पत्नी/कानूनी उत्तराधिकारी को तारीख २१/०१/२०२५ किया जाएगा.

चूंकि उपरोक्त भुगतान कर दिया गया है, इसलिए श्रमिक की आकस्मिक मृत्यु के संबंध में कोई अधिकार, या विवाद नहीं होगा, और पार्टियों ने इस दिन इस लेखन में प्रवेश किया है: २१/०१/२०२५।

आशा देवी: आशा देवी

(स्वर्गीय श्री मुंद्रिका यादव की पत्नी)



आशा देवी

गवाह:

1. नाम: Rawnish Rai हस्ताक्षर:

2. नाम: Prashant Jadav हस्ताक्षर:

बिदान: रुपये ४०,००,००० /- डीडी की फोटोकॉपी।

NOTARY FALGUNIBEN P.BAROT BHARUCH DISTRICT OF GUJARAT STATE REGD. No.18266 EXPIRY DATE 10/02/2025 GOVT. OF INDIA

NOTARY Falguni P. Barot BHARUCH DISTRICT Guj. State Reg. No. 18266 GOVT. OF INDIA

REGISTERED
FALGUNI P. BAROT
ADVOCATE & NOTARY
GOVT. OF INDIA
BHARUCH DISTRICT (GUJARAT)
...83/2025 Dt. 21/1/25
My Commission Expires on Dt. 10/02/2025

BEFORE ME
(Falguni P. Barot)
ADVOCATE & NOTARY
Govt. of India
Bharuch District (Gujarat)

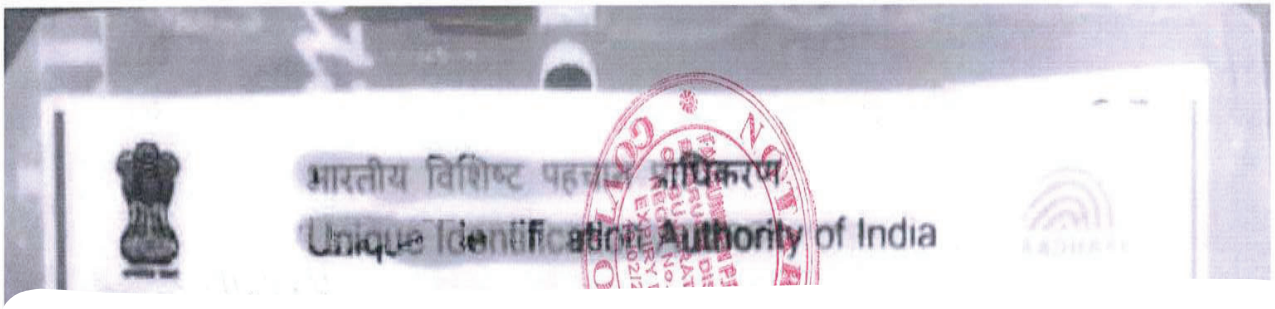
21 JAN 2025

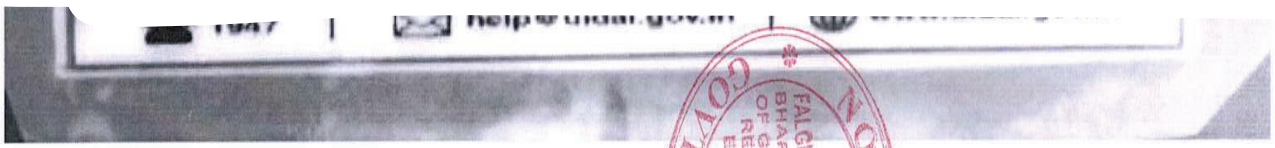


भारत सरकार

Government of India

मेरा आधार, मेरी पहचान


भारतीय विशिष्ट पहचान प्राधिकरण
Unique Identification Authority of India



1654

A/C PAYEE ONLY

Drawee Branch

534928

VALID FOR THREE MONTHS ONLY

DATE 2 6 0 1 2 0 2 5

D D M M Y Y Y Y

DD No.

ASHA DEVI********

ON DEMAND PAY FORTY LAKH Only OR ORDER

RUPEES

₹ ********40,00,000.00

Purchaser Name: GUJARAT FLUOROCHEMICALS LTD/ASHA DEVI

OC/4/7 Not Above 40,00,000.00

FOR VALUE RECEIVED

0003DDCENPAY

ICICI BANK LIMITED

Issuing Branch

Authorised Signatory

Authorised Signatory

Please sign above

⑈534928⑈ 000229000⑆ 000003⑈ 16

आशा देवी

NOTARY
FALGUNIBEN P.BAROT
BHARUCH DISTRICT
OF GUJARAT STATE
REGD. No.18266
EXPIRY DATE
10/02/2025
GOVT. OF INDIA

GUJARAT FLUOROCHEMICALS
VALUE THROUGH GREEN CHEMISTRY
An INOXGFL Group Company
CIN : L24304GJ2018PLC105479

Gujarat Fluorochemicals Limited
earlier known as Inox Fluorochemicals Limited

12/A, GIDC Dahej Industrial Estate, Taluka Vagra, Distt. Bharuch-392130, Gujarat, India | Tel: +91-2641-618031 (Admin) / 618041-50 (Purchase) / 618086-87 (Security) | www.gfl.co.in

Date: 14/02/2025

To,
The Commissioner for Workmen compensation
Labour court,
Bharuch

SUB: - Depositing of claim amount in respect of Late Shri **Mahesh S/O Nandlal**

Enclosed herewith please find the following documents i.r.o. depositing of claim amount of out deceased employee Late Shri **Mahesh S/O Nandlal working under contract of M/S. Leo Coats (India) Pvt. Ltd.**

1. Form A (in two copies)
2. Demand Draft no. 533132, Dated 14/02/2025, amounting to Rs. **12,50,000/-** (Twelve lakhs fifty thousand rupees only), drawn in favour of **"The Judge Labour Court, Bharuch"**.
3. Computation of Claim Amount
4. Details of name & address of family members of deceased employee.
5. Copy of Death certificate
6. Proof of Date of Birth
7. No Objection Certificate
8. Inquest Panchnama and PM report

Kindly receive the above in order & do the needful.

Thanking you,
Yours truly,
Gujarat Fluorochemicals Limited.,

Authorised Signatory.

Superintendent
Labour Court, Bharuch

GUJARAT FLUOROCHEMICALS
VALUE THROUGH GREEN CHEMISTRY
An INOXGFL Group Company
CIN : L24304GJ2018PLC105479

Gujarat Fluorochemicals Limited
earlier known as Inox Fluorochemicals Limited

12/A, GIDC Dahej Industrial Estate, Taluka Vagra, Distt. Bharuch-392130, Gujarat, India | Tel: +91-2641-618031 (Admin) / 618041-50 (Purchase) / 618086-87 (Security) | www.gfl.co.in

FORM A
[See rule 6 (1)]

DEPOSIT OF COMPENSATION FOR FATAL ACCIDENT
(Section 8(1) of the Workmen's Compensation Act, 1923)

Compensation amounting to **Rs, 14,04,070=00** is hereby presented for deposit in respect of injuries resulting in the death of the workman, whose particulars are given below, which occurred on .

Name of Employee: Mahesh
Father's Name: Nandlal
(Husband's name in case of married woman and widow.)
Cast: Hindu
Local address: Gram: Kone, Post: Kone, Thana: Kone, Ramgarh, Sonbhadra, Uttar Pradesh - 231226

Permanent address: - As above

His / Her monthly wages are estimated at **Rs 12,900 /-** He was over the age of 25 years at the time of his death.

2. The said workman had, prior to the date of his death, received the following payments, namely:

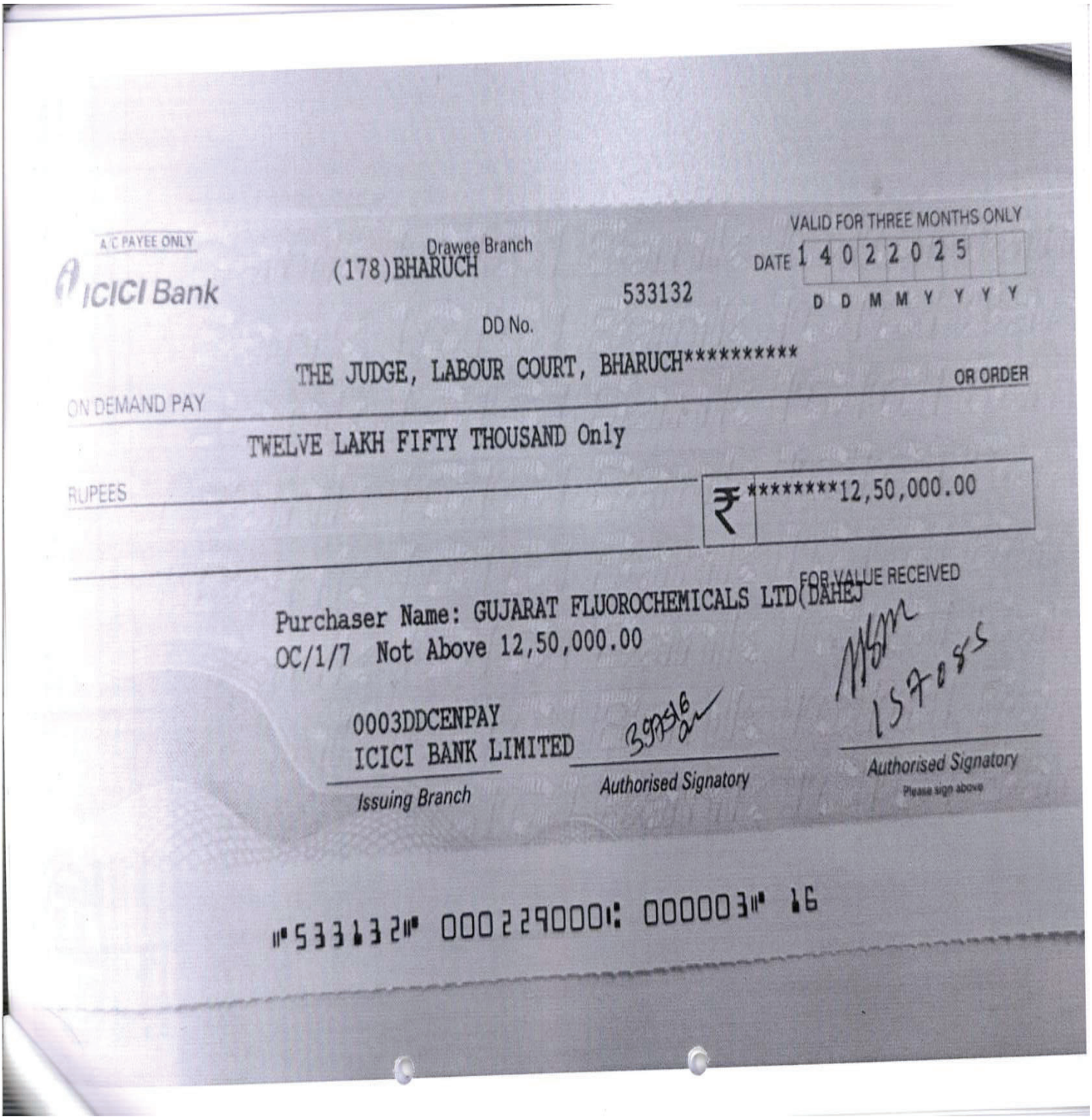
The said workman joined on 24th December,2024 under contract of **M/S. Leo Coats (India) Pvt. Ltd.** and accident happened on 28th December, 2024. His daily wage is calculated at **Rs. 497/-**. Amounting to average monthly salary of **Rs. 12,900/-**.

3. An advance of Rs. NIL has been made on account of compensation to being his / her dependant.
4. *I do not/desire to be made a party to the proceedings for distribution of the aforesaid compensation.

Dated – 14/02/2025

Employer

* An employer desiring to be made a party to the proceedings should strike out the words "do not".



A/C PAYEE ONLY

ICICI Bank

Drawee Branch

(178)BHARUCH

VALID FOR THREE MONTHS ONLY

DATE 1 4 0 2 2 0 2 5

D D M M Y Y Y Y

533132

DD No.

THE JUDGE, LABOUR COURT, BHARUCH**********

ON DEMAND PAY

OR ORDER

TWELVE LAKH FIFTY THOUSAND Only

RUPEES

₹ ********12,50,000.00

FOR VALUE RECEIVED

Purchaser Name: GUJARAT FLUOROCHEMICALS LTD(DAHEJ

OC/1/7 Not Above 12,50,000.00

0003DDCENPAY

ICICI BANK LIMITED

Issuing Branch

Authorised Signatory

Authorised Signatory

Please sign above

⑈533132⑈ 000229000⑆ 000003⑈ 16

GUJARAT FLUOROCHEMICALS
VALUE THROUGH GREEN CHEMISTRY
An INOX GFL Group Company
CIN : L24304GJ2018PLC105479

Gujarat Fluorochemicals Limited
earlier known as Inox Fluorochemicals Limited

12/A, GIDC Dahej Industrial Estate, Taluka Vagra, Distt. Bharuch-392130, Gujarat, India | Tel: +91-2641-618031 (Admin) / 618041-50 (Purchase) / 618086-87 (Security) | www.gfl.co.in

COMPUTATION OF CLAIM AMOUNT

Name of the deceased person: Late Mahesh S/O Nandlal

Age as on date of Death: - 25 years

Relevant Factor: - 216.91

Average Salary: - Rs. 12,900/-

Compensation Amount: - Fifty percent of Average salary * Relevant factor

Funereal Charges – 5000/-

i.e., 12,900/2* 216.91 = 13,99,070 + 5,000 (Funeral Expense) = RS. 14,04,070/- (Fourteen lakhs four thousand and seventy rupees only)

GUJARAT FLUOROCHEMICALS
VALUE THROUGH GREEN CHEMISTRY
An INOX GFL Group Company
CIN : L24304GJ2018PLC105479

Gujarat Fluorochemicals Limited
earlier known as Inox Fluorochemicals Limited

12/A, GIDC Dahej Industrial Estate, Taluka Vagra,
Distt. Bharuch-392130, Gujarat, India

Tel: +91-2641-618031 (Admin) / 618041-50 (Purchase) /
618086-87 (Security) | www.gfl.co.in

Date: 14/02/2025

Details of name & address of family members of deceased employee.

1. Nandlal S/O Late Ram Naresh– Age :70 (Deceased Father)

GUJARAT FLUOROCHEMICALS
VALUE THROUGH GREEN CHEMISTRY
An INOXGFL Group Company
CIN : L24304GJ2018PLC105479

Gujarat Fluorochemicals Limited
earlier known as Inox Fluorochemicals Limited

12/A, GIDC Dahej Industrial Estate, Taluka Vagra, Distt. Bharuch-392130, Gujarat, India

Tel: +91-2641-618031 (Admin) / 618041-50 (Purchase) / 618086-87 (Security) | www.gfl.co.in

Date: 14/02/2025

NO OBJECTION CERTIFICATE

This is to certify that **Late Shri Mahesh S/O Nandlal** met with an accident on 28/12/2024, resulting in his death.

This accident took place in course of his employment while discharging his duties. Claim amount of Rs. **14,04,070/- (Fourteen lakhs four thousand and seventy rupees only)** is due & payable to him & the same has been deposited by us in the Labour court at Bharuch.

We have NO OBJECTION if the claim amount is paid by the court to the deceased's legal heirs & we do not want to be a party to the claim distribution.

We are herewith depositing amount of Rs. 12,50,000/- as a lumpsum compensation & remaining compensation amount will be deposited as ordered by the Hon'ble court in due course of time.

FALGUNI P. BAROT
Advocate & Notary
903, Sai Heights,
ABC Chokdi, Nr. Rohini Nagar,
Bholav, Tal. & Dist. BHARUCH-392015
Mob.: 9427879418

21 JAN

IN-GJ41255929371011X

1661

INDIA NON JUDICIAL

Government of Gujarat

सत्यमेव जयते

Certificate of Stamp Duty

FALGUNI P. BAROT
NOTARY BHARUCH (GUJ.)
Reg. No. 18266
Date 21 JAN 2025
Sr. No. 82/2025
My Commission Expires on Date 10-2-2025

Certificate No.	:	IN-GJ41255929371011X
Certificate Issued Date	:	21-Jan-2025 03:25 PM
Account Reference	:	IMPACC (AC)/ gj13244011/ BHARUCH/ GJ-BH
Unique Doc. Reference	:	SUBIN-GJGJ13244011946671003331 96X
Purchased by	:	PRASHANT JADAV
Description of Document	:	Article 5(h) Agreement (not otherwise provided for)
Description	:	SAMJUTI KARAR
Consideration Price (Rs.)	:	0 (Zero)
First Party	:	GUJARAT FLUOROCHEMICALS LTD
Second Party	:	NANDLAL
Stamp Duty Paid By	:	GUJARAT FLUOROCHEMICALS LTD
Stamp Duty Amount(Rs.)	:	300 (Three Hundred only)

NOTARY
FALGUNIBEN P.BAROT
BHARUCH DISTRICT
OF GUJARAT STATE
REGD. No.18266
EXPIRY DATE
10/02/2025
OF INDIA

FALGUNI P. BAROT
BHARUCH

HF 0028114229

Statutory Alert:
1. The authenticity of this Stamp certificate should be verified at 'www.shcilestamp.com' or using e-Stamp Mobile App of Stock Holding. Any discrepancy in the details on this Certificate and as available on the website / Mobile App renders it invalid.
2. The onus of checking the legitimacy is on the users of the certificate.
3. In case of any discrepancy please inform the Competent Authority.

GUJARAT FLUOROCHEMICALS LTD GUJARAT FLUOROCHEMICALS LTD GUJARAT FLUOROCHEMICALS LTD GUJARAT FLUOROCHEMICALS LTD GUJARAT FLUOROCHEMICALS LTD



NOTICE

- The contents of this e-stamp certificate can be verified at www.shcilestamp.com, Stock Holding mobile application "EStamping" or at Stock Holding Branch/ Centre (the details of which are available at www.stockholding.com).
- Any alteration to this certificate renders it invalid and would constitute a criminal offence.
- Kindly contact Stock Holding Branch / Centre in case of discrepancy.
- For information related to e-Stamping you may write to us on our email id estamp.ahmedabad@stockholding.com or visit our Branch/Centre.

સૂચના

- આ ઈ-સ્ટેમ્પ પ્રમાણપત્રની વિગતો www.shcilestamp.com દ્વારા અથવા સ્ટોક હોલ્ડિંગની "ઈસ્ટેમ્પિંગ" મોબાઈલ એપ્લિકેશન અથવા સ્ટોક હોલ્ડિંગની શાખા / કેન્દ્ર (જેની વિગતો www.stockholding.com પર ઉપલબ્ધ છે) પર જઈ ને ચકાસી શકાય છે.
- આ પ્રમાણપત્રમાં કરેલ કોઈપણ ફેરફાર અમાન્ય છે અને તે ફોજદારી ગુનો બને છે.
- આ ઈ-સ્ટેમ્પ પ્રમાણપત્રમાં કોઈપણ વિસંગતતા જણાય તો સ્ટોક હોલ્ડિંગની શાખા / કેન્દ્ર પર સંપર્ક કરવો.
- ઈ-સ્ટેમ્પિંગ સંબધિત જાણકારી માટે અમને estamp.ahmedabad@stockholding.com પર ઈ-મેઈલ કરવો અથવા અમારી શાખા / કેન્દ્ર ની મુલાકાત લેવી.

समझौता ज्ञापन

तारीख २८/१२/२०२४ को आकस्मिक दुर्घटना में श्री महेश सन ऑफ़ नन्द लाल जो गुजरात फ्लोरोकेमिकल्स लिमिटेड-ए, दहेज यूनिट के अंडर मेसर्स लियो कोट इंडिया प्राइवेट लिमिटेड में कार्यरत थे। वह दूसरी पाली में ड्यूटी पर थे और आकस्मिक दुर्घटना के कारण उनकी मृत्यु हो गई।

उपरोक्त अतिरिक्त भुगतान के अलावा, आईसीआई बैंक दिनांक २०/०१/२०२५ डीडी संख्या: ५३४९२९ रुपये: ४०,००,००० /- (चालीस लाख रुपये पूर्ण) का भुगतान मानवीय आधार पर मृतक के पिताजी /कानूनी उत्तराधिकारी को तारीख २१/०१/२०२५ किया जाएगा.

चूंकि उपरोक्त भुगतान कर दिया गया है, इसलिए श्रमिक की आकस्मिक मृत्यु के संबंध में कोई अधिकार, या विवाद नहीं होगा, और पार्टियों ने इस दिन इस लेखन में प्रवेश किया है: २१/०१/२०२५।

नन्द लाल: नन्द लाल

(स्वर्गीय श्री महेश के पिताजी)



गवाह:

1. नाम: Rajnish Singh हस्ताक्षर:

2. नाम: Ruchana Sadaw हस्ताक्षर:

बिदान: रुपये ४०,००,००० /- डीडी की फोटोकॉपी।

NOTARY FALGUNIBEN P.BAROT BHARUCH DISTRICT OF GUJARAT STATE REGD. No.18266 EXPIRY DATE 10/02/2025 GOVT. OF INDIA

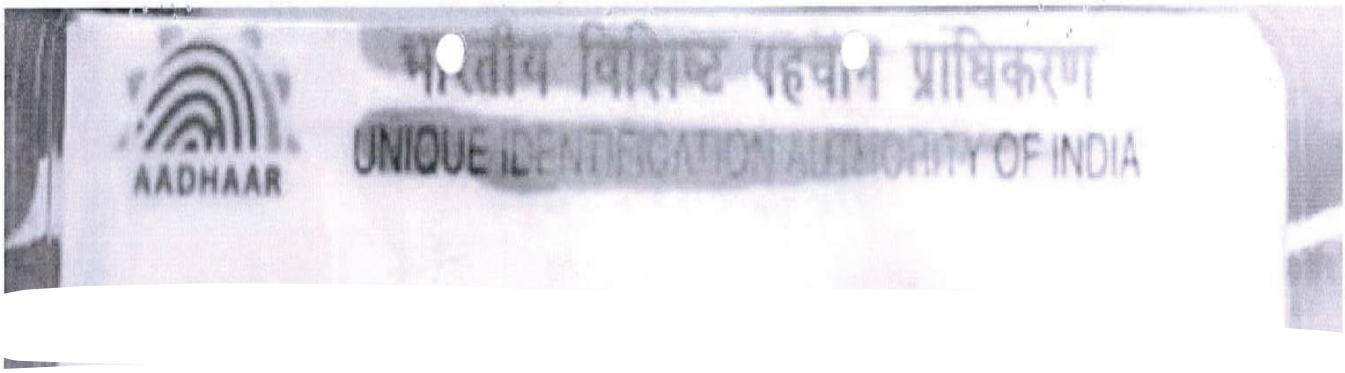
NOTARY Falguni P. Barot BHARUCH DISTRICT Guj. State Reg. No. 18266 GOVT. OF INDIA

REGISTERED
Falguni
FALGUNI P. BAROT
ADVOCATE & NOTARY
GOVT. OF INDIA
BHARUCH DISTRICT (GUJARAT)
Sr. No. 82/2025 Dt. 21/1/2025
My Commission Expires on Dt. 10/02/2025

BEFORE ME
Falguni
(Falguni P. Barot)
ADVOCATE & NOTARY
Govt. of India
Bharuch District (Gujarat)
21 JAN 2025



आधार - आम आदमी का अधिकार





Aadhaar-Aam Admi ka Adhikar

A/C PAYEE ONLY

ICICI Bank

Drawee Branch

534929

VALID FOR THREE MONTHS ONLY

DATE 2 0 0 1 3 0 2 5

D D M M Y Y Y Y

DD No.

NAND LAL**********

ON DEMAND PAY

OR ORDER

FORTY LAKH Only

RUPEES

₹ ********40,00,000.00

Purchaser Name: GUJARAT FLUOROCHEMICALS LTD(DAHEJ)

FOR VALUE RECEIVED

OC/4/7 Not Above 40,00,000.00

VOID

0003DDCENPAY

ICICI BANK LIMITED

Issuing Branch

Authorised Signatory

Authorised Signatory

Please sign above

UTILITY FORMS PVT. LTD. / CTS - 2010

⑈534929⑈ 000229000⑆ 000003⑈ 16

सत्यमेव जयते

NOTARY

FALGUNIBEN PRAROT

BHARUCH DISTRICT

OF GUJARAT STATE

REGD. No.18268

EXPIRY DATE

10/02/2025

GOVT. OF INDIA

GUJARAT FLUOROCHEMICALS
VALUE THROUGH GREEN CHEMISTRY
An INOXGFL Group Company
CIN : L24304GJ2018PLC105479

Gujarat Fluorochemicals Limited
earlier known as Inox Fluorochemicals Limited

12/A, GIDC Dahej Industrial Estate, Taluka Vagra, Distt. Bharuch-392130, Gujarat, India | Tel: +91-2641-618031 (Admin) / 618041-50 (Purchase) / 618086-87 (Security) | www.gfl.co.in

Date: 14/02/2025

To,
The Commissioner for Workmen compensation
Labour court,
Bharuch

SUB: - Depositing of claim amount in respect of Late Shri **Suchit Kumar S/O Sugrim Prasad**

Enclosed herewith please find the following documents i.r.o. depositing of claim amount of out deceased employee Late Shri **Suchit Kumar S/O Sugrim Prasad working under contract of M/S. Leo Coats (India) Pvt. Ltd.**

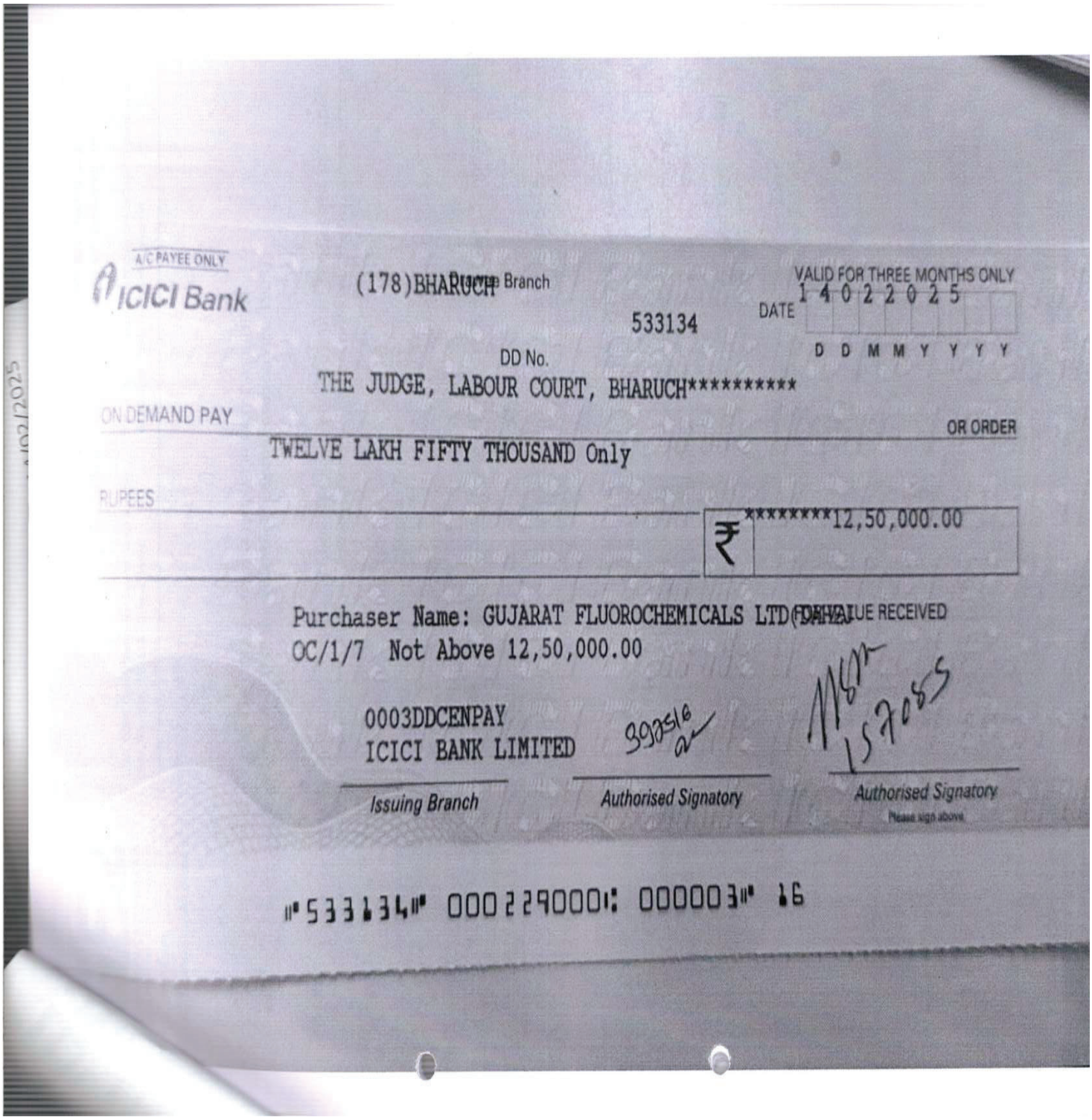
1. Form A (in two copies)
2. Demand Draft no. 533134, Dated 14/02/2025, amounting to Rs. **12,50,000/-** (Twelve lakhs fifty thousand only), drawn in favour of **"The Judge Labour Court, Bharuch".**
3. Computation of Claim Amount
4. Details of name & address of family members of deceased employee.
5. Copy of Death certificate
6. Proof of Date of Birth
7. No Objection Certificate
8. Inquest Panchnama and PM report

Kindly receive the above in order & do the needful.

Thanking you,
Yours truly,
Gujarat Fluorochemicals Limited.,

Authorised Signatory.

Superintdent
Labour Court, Bharuch



A/C PAYEE ONLY

ICICI Bank

(178)BHARUCH Branch

VALID FOR THREE MONTHS ONLY

DATE 1 4 0 2 2 0 2 5

D D M M Y Y Y Y

533134

DD No.

THE JUDGE, LABOUR COURT, BHARUCH**********

ON DEMAND PAY

OR ORDER

TWELVE LAKH FIFTY THOUSAND Only

RUPEES

₹ *********12,50,000.00

Purchaser Name: GUJARAT FLUOROCHEMICALS LTD(DAHEJ

VALUE RECEIVED

OC/1/7 Not Above 12,50,000.00

0003DDCENPAY

ICICI BANK LIMITED

Issuing Branch

Authorised Signatory

Authorised Signatory

Please sign above

"533134" 000229000: 000003" 16

Gujarat Fluorochemicals Limited
earlier known as Inox Fluorochemicals Limited

GFL GUJARAT FLUOROCHEMICALS THROUGH GREEN CHEMISTRY
INOX GFL Group Company
CIN : L24304GJ2018PLC105479

12/A, GIDC Dahej Industrial Estate, Taluka Vagra, Distt. Bharuch-392130, Gujarat, India

Tel: +91-2641-618031 (Admin) / 618041-50 (Purchase) / 618086-87 (Security) | www.gfl.co.in

FORM A

[See rule 6 (1)]

DEPOSIT OF COMPENSATION FOR FATAL ACCIDENT
(Section 8(1) of the Workmen's Compensation Act, 1923)

Compensation amounting to Rs, 12,27,662=00 is hereby presented for deposit in respect of injuries resulting in the death of the workman, whose particulars are given below, which occurred on .

Name of Employee: Suchit Kumar S/O Sugrim Prasad
Father's Name: Sugrim Prasad
(Husband's name in case of married woman and widow.)
Cast: Hindu
Local address: 178, Gram: Kone, Post: Kone, Thana: Kone, Ramgarh, Sonbhadra, Uttar Pradesh
- 231226

Permanent address: - As above

His / Her monthly wages are estimated at Rs 12,900 /- He was over the age of 25 years at the time of his death.

2. The said workman had, prior to the date of his death, received the following payments, namely:

The said workman joined on 24th December,2024 under contract of M/S. Leo Coats (India) Pvt. Ltd. and accident happened on 28th December, 2024. His daily wage is calculated at Rs. 497/-. Amounting to average monthly salary of Rs. 12,900/-.

3. An advance of Rs. NIL has been made on account of compensation to being his / her dependant.

4. *I do not/desire to be made a party to the proceedings for distribution of the aforesaid compensation.

Dated – 14/02/2025

Employer

* An employer desiring to be made a party to the proceedings should strike out the words "do not".

Gujarat Fluorochemicals Limited
earlier known as Inox Fluorochemicals Limited

12/A, GIDC Dahej Industrial Estate, Taluka Vagra, Distt. Bharuch-392130, Gujarat, India | Tel: +91-2641-618031 (Admin) / 618041-50 (Purchase) / 618086-87 (Security) | www.gfl.co.in

GFL Group Company
L24304GJ2018PLC105479

COMPUTATION OF CLAIM AMOUNT

Name of the deceased person: Late Suchit kumar S/O Sugrim Prasad

Age as on date of Death: - 38 years

Relevant Factor: - 189.56

Average Salary: - Rs. 12,900/-

Compensation Amount: - Fifty percent of Average salary * Relevant factor

Funereal Charges – 5000/-

i.e., 12,900/2* 189.56 = 12,22,662 + 5,000 (Funeral Expense) = RS. 12,27,662/- (Twelve lakhs twenty-seven thousand six hundred and sixty-two rupees only)

Gujarat Fluorochemicals Limited
earlier known as Inox Fluorochemicals Limited

12/A, GIDC Dahej Industrial Estate, Taluka Vagra, Distt. Bharuch-392130, Gujarat, India | Tel: +91-2641-618031 (Admin) / 618041-50 (Purchase) / 618086-87 (Security) | www.gfl.co.in

FLUOROCHEMICALS
GREEN CHEMISTRY
GFL Group Company
L24304GJ2018PLC105479

Date: 14/02/2025

Details of name & address of family members of deceased employee.

1. Tara Devi W/O Late Shri Suchit Kumar – Age :29 (Deceased's Spouse)

Gujarat Fluorochemicals Limited
earlier known as Inox Fluorochemicals Limited

AT FLUOROCHEMICALS
THROUGH GREEN CHEMISTRY
INOX GFL Group Company
CIN : L24304GJ2018PLC105479

12/A, GIDC Dahej Industrial Estate, Taluka Vagra,
Distt. Bharuch-392130, Gujarat, India

Tel: +91-2641-618031 (Admin) / 618041-50 (Purchase) /
618086-87 (Security) | www.gfl.co.in

Date: 14/02/2025

NO OBJECTION CERTIFICATE

This is to certify that Late Shri Suchit Kumar S/O Sugrim Prasad met with an accident on 28/12/2024, resulting in his death.

This accident took place in course of his employment while discharging his duties. Claim amount of Rs. 12,27,662/- (Twelve lakhs twenty-seven thousand six hundred and sixty-two rupees only) is due & payable to him & the same has been deposited by us in the Labour court at Bharuch.

We have NO OBJECTION if the claim amount is paid by the court to the deceased's legal heirs & we do not want to be a party to the claim distribution.

In case of claim amount likely to increased or decreased, we humbly request you to intimate us for the necessary action from our end.

1673

FALGUNI P. BAROT
Advocate & Notary
903, Sai Heights,
ABC Chokdi, Nr. Rohini Nagar,
Bholav, Tal. & Dist. BHARUCH
Mob.: 942...

21 JAN 2025

IN-GJ41264883974962X

INDIA NON JUDICIAL

Government of Gujarat

Certificate of Stamp Duty

सत्यमेव जयते

FALGUNI P. BAROT
NOTARY BHARUCH (GUJ.)
Reg. No. 18266
Date 21 JAN 2025
Sr. No. 84/2025
My Commission Expires on Date 10-2-2025

Certificate No.	:	IN-GJ41264883974962X
Certificate Issued Date	:	21-Jan-2025 03:30 PM
Account Reference	:	IMPACC (AC)/ gj13244011/ BHARUCH/ GJ-BH
Unique Doc. Reference	:	SUBIN-GJGJ13244011946863165327 42X
Purchased by	:	PRASHANT JADAV
Description of Document	:	Article 5(h) Agreement (not otherwise provided for)
Description	:	SAMJUTI KARAR
Consideration Price (Rs.)	:	0 (Zero)
First Party	:	GUJARAT FLUOROCHEMICALS LTD
Second Party	:	TARA DEVI
Stamp Duty Paid By	:	GUJARAT FLUOROCHEMICALS LTD
Stamp Duty Amount(Rs.)	:	300 (Three Hundred only)

NOTARY
FALGUNIBEN P.BAROT
BHARUCH DISTRICT
OF GUJARAT STATE
REGD. No.18266
EXPIRY DATE
10/02/2025
GOVT. OF INDIA

FALGUNI P. BAROT
BHARUCH

HF 0028114231

Statutory Alert:
1. The authenticity of this Stamp certificate should be verified at 'www.shcilestamp.com' or using e-Stamp Mobile App of Stock Holding. Any discrepancy in the details on this Certificate and as available on the website / Mobile App renders it invalid.
2. The onus of checking the legitimacy is on the users of the certificate.
3. In case of any discrepancy please inform the Competent Authority.

GUJARAT FLUOROCHEMICALS LTD GUJARAT FLUOROCHEMICALS LTD GUJARAT FLUOROCHEMICALS LTD GUJARAT FLUOROCHEMICALS LTD



NOTICE

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- Any alteration to this certificate renders it invalid and would constitute a criminal offence.
- Kindly contact Stock Holding Branch / Centre in case of discrepancy.
- For information related to e-Stamping you may write to us on our email id estamp.ahmedabad@stockholding.com or visit our Branch/Centre.

સૂચના

- આ ઈ-સ્ટેમ્પ પ્રમાણપત્રની વિગતો www.shcilestamp.com દ્વારા અથવા સ્ટોક હોલ્ડિંગની "ઈસ્ટેમ્પિંગ" મોબાઈલ એપ્લિકેશન અથવા સ્ટોક હોલ્ડિંગની શાખા / કેન્દ્ર (જેની વિગતો www.stockholding.com પર ઉપલબ્ધ છે) પર જઈ ને ચકાસી શકાય છે.
- આ પ્રમાણપત્રમાં કરેલ કોઈપણ ફેરફાર અમાન્ય છે અને તે ફોજદારી ગુનો બને છે.
- આ ઈ-સ્ટેમ્પ પ્રમાણપત્રમાં કોઈપણ વિસંગતતા જણાય તો સ્ટોક હોલ્ડિંગની શાખા / કેન્દ્ર પર સંપર્ક કરવો.
- ઈ-સ્ટેમ્પિંગ સંબધિત જાણકારી માટે અમને estamp.ahmedabad@stockholding.com પર ઈ-મેઈલ કરવો અથવા અમારી શાખા / કેન્દ્ર ની મુલાકાત લેવી.

समझौता ज्ञापन

तारीख २८/१२/२०२४ को आकस्मिक दुर्घटना में श्री सूचित कुमार सेन ऑफ़ सुग्रीम प्रसाद जो गुजरात फ्लोरोकेमिकल्स लिमिटेड-ए, दहेज यूनिट के अंडर मेसर्स लियो कोट इंडिया प्राइवेट लिमिटेड में कार्यरत थे। वह दूसरी पाली में ड्यूटी पर थे और आकस्मिक दुर्घटना के कारण उनकी मृत्यु हो गई।

उपरोक्त अतिरिक्त भुगतान के अलावा, आईसीआई बैंक दिनांक २०/०१/२०२५ डीडी संख्या: ५३४९३० रुपये: ४०,००,००० /- (चालीस लाख रुपये पूर्ण) का भुगतान मानवीय आधार पर मृतक की पत्नी/कानूनी उत्तराधिकारी को तारीख २१/०१/२०२५ किया जाएगा.

चूंकि उपरोक्त भुगतान कर दिया गया है, इसलिए श्रमिक की आकस्मिक मृत्यु के संबंध में कोई अधिकार, या विवाद नहीं होगा, और पार्टियों ने इस दिन इस लेखन में प्रवेश किया है: २१/०१/२०२५।

तारा देवी: तारा देवी

(स्वर्गीय श्री सूचित कुमार की पत्नी)



गवाह:

1. नाम: Rajnish Singh हस्ताक्षर:

2. नाम: Prashant Jadav हस्ताक्षर:

बिदान: रुपये ४०,००,००० /- डीडी की फोटोकॉपी।

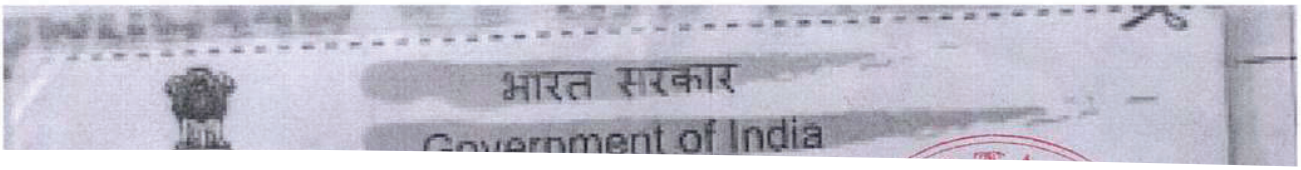
NOTARY FALGUNIBEN P.BAROT BHARUCH DISTRICT OF GUJARAT STATE REGD. No.18266 EXPIRY DATE 10/02/2025 GOVT. OF INDIA

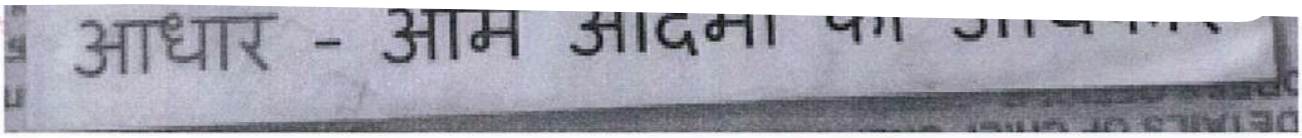
NOTARY Falguni P. Barot BHARUCH DISTRICT Guj. State Reg. No. 18266 GOVT. OF INDIA

REGISTERED
Falguni
FALGUNI P. BAROT
ADVOCATE & NOTARY
GOVT. OF INDIA
BHARUCH DISTRICT (GUJARAT)
Sr. No. 84/2025 Dt. 21/1/2025
My Commission Expires on Dt. 10/02/2025

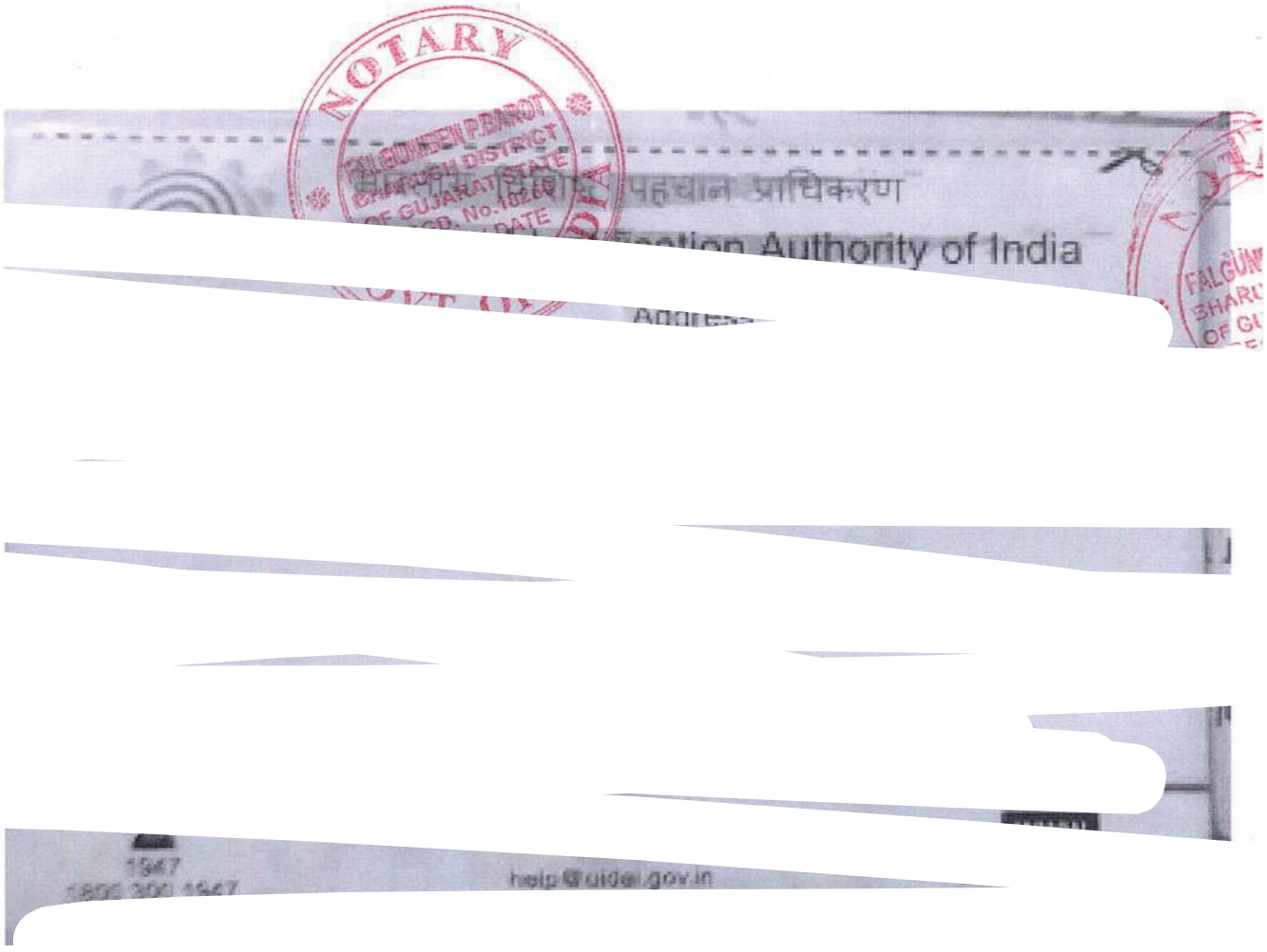
BEFORE ME
Falguni
(Falguni P. Barot)
ADVOCATE & NOTARY
Govt. of India
Bharuch District (Gujarat)

21 JAN 2025





तारा देवी.


NOTARY
पहचान प्राधिकरण
Authority of India
help@uidai.gov.in

1678

A/C PAYEE ONLY

ICICI Bank

Drawee Branch (891 RODRIGUES)

534930

VALID FOR THREE MONTHS ONLY

DATE 0 0 1 2 0 2 5

D D M M Y Y Y Y

DD No.

TARA DEVI**********

ON DEMAND PAY OR ORDER

FORTY LAKH Only

RUPEES

₹ ********40,00,000.00

FOR VALUE RECEIVED

Purchaser Name: GUJARAT FLUOROCHEMICALS LTD(DAHEJ)
OC/4/7 Not Above 40,00,000.00

0003DDCENPAY
ICICI BANK LIMITED

Issuing Branch | Authorised Signatory | Authorised Signatory

Please sign above

"534930" 000229000": 000003" 16

FALGUNIBEN P.BAROT
BHARUCH DISTRICT
OF GUJARAT STATE
REGD. No.18266
EXPIRY DATE
10/02/2025
NOTARY
GOVT. OF INDIA

तारा देवी

UTILITY FORMS PVT. LTD. / CTS - 2010

NET Payment Receipt

PCB ID: 15136-Gujarat Fluorochemicals Limited

Address : Plot No. 12 / A,E-50/1 Dahej GIDC Industrial Estate, , , -Dahej, Bharuch Pin : -392130

Application: 1911930(IEC)-dd/MM/yyyy

Payment Id	**592194**
Payment Date	**06/01/2025**
Paid Amount	**10000000**
Bank Details	**ICO-*****
Transaction No	**ZICOCMX0A4GQE5**
Status	**Success**
Remarks	**Transaction Successful**
Referance No	**1800883-1911930**
Type	**IEC**
MIS Date	**07/01/2025**

Date : 13/03/2025

ANNEXURE-R1/9

GUJARAT FLUOROCHEMICALS
VALUE THROUGH GREEN CHEMISTRY
An INOXGFL Group Company
CIN : L24304GJ2018PLC105479

Gujarat Fluorochemicals Limited
earlier known as Inox Fluorochemicals Limited

12/A, GIDC Dahej Industrial Estate, Taluka Vagra, Distt. Bharuch-392130, Gujarat, India

Tel: +91-2641-618031 (Admin) / 618041-50 (Purchase) / 618086-87 (Security) | www.gfl.co.in

08.01.2025

To,

Deputy Director

Inspector of Factories & Deputy Director,

Industrial Safety and Health, Bharuch

Kind attention Smt. J.J. Chauhan

Subject: - Request for revocation of closure notice dated 29th December 2024

Respected Madam

We are hereby informing you that, we have made compliance against all the observations and details are as below

1. Demolition or removal of damaged pipelines and other parts in the factory should be carried out by an expert / experienced person / agency wearing personal protective equipment as per Indian norms and carry out such work after ensuring that there is no toxic gas in the pipeline. (Page No. 51 to 54)

We had removed the damaged valve and connected pipeline after proper decontamination. M/s Sri Krishna Descaler P Ltd is hired for performing this activity and DISH approved competent agency M/s ROLLSCOAX India Pvt Ltd is available at site for Inspection, Testing and Certification work.

This activity is done through proper Work Permit System. We had confirmed that there is no residual gas available inside system prior to starting the work. Also ensured that all working personnel are provided with required PPE's.

Sample Work Permit issued for the job is attached.

2. CMS-1 factory plant machinery and machinery parts of the factory, which in case of failure may cause an emergency or emergency situation, all the equipment and machinery are tested by a competent person before starting the process and produce a certificate that are safe to use. (Page No. 55 to 426)

We had availed the service of DISH approved competent agency M/s ROLLSCOAX India Pvt Ltd in CMS-1 plant for carrying out Inspection, Testing and Certification of equipment which may cause emergency or an emergency situation. All the relevant certificates have been obtained.

08/01/25

જુનિયર ક્લાર્ક
ઔદ્યોગિક સલામતી અને સ્વાસ્થ્ય
ભરૂચ

GUJARAT FLUOROCHEMICALS
An INOX GFL Group Company
CIN : L24304GJ2018PLC105479

Gujarat Fluorochemicals Limited
earlier known as Inox Fluorochemicals Limited

12/A, GIDC Dahej Industrial Estate, Taluka Vagra, Distt. Bharuch-392130, Gujarat, India

Tel: +91-2641-618031 (Admin) / 618041-50 (Purchase) / 618086-87 (Security) | www.gfl.co.in

3. In this plant available pressure vessels and plant shall be hydrostatic test by competent person. If water traces are not allowed due to process requirement, such particular pressure vessel and plant shall be tested by equivalent approved test method and provide Form 11. (Page No. 55 to 426)

Hydrostatic test/Gamma Scanning of pressure vessel and plant is carried out and witnessed by DISH approved competent person. Detailed Form 11 are attached.

4. To furnish record evidence for training of the worker as per section 111-A of the Factories Act, 1948. (Page No. 427 to 501)

We had conducted Safety training from approved training institute as per Factory Act 1948 Section 111-A. List of participants who attended the training is attached.

DISH Approved inspection agency / competent person letter for above compliance is attached with. Based on the above compliances, we request you to grant permission to operate the plant at the earliest.

Thanking You

Your's Truly

Factory Manager

CC: Director Industrial Health and Safety, Gujarat State, Ahmedabad

Joint Director Industrial Health and Safety, Gujarat State, Surat

HAZOP Recommendation & It's Implementation Status – CMS-1 Plant

Place(s) Used	Recommendations	Responsible Person / Dept	Priority	Status	Remarks
Cat: 1.1.29.1.1.1	1. Perform regular sampling of Hot Oil for Methanol content to identify tube leakage	Production	R3	Closed	
Cat: 1.2.22.1.1.1	2. Review the Chemical compatibility of Hot Oil at supply temperature with HCL	Production	R3	Closed	
Cat: 1.6.21.1.1.1	3. Review closed sampling system from V-2105 bottom valve	Technical Service	R3	Closed	
Cat: 1.9.17.1.1.1	4. Regular sampling (once on two weeks) of methanol to check for MDC content	Production	R3	Closed	
Cat: 1.13.44.1.1.1	5. Regular inspection of all RDs	Engineering	R1	Closed	
Cat: 1.15.47.1.1.1	6. Regular planned inspection of tubes.	Engineering	R3	Closed	
Cat: 1.16.11.1.2.1, 1.16.11.2.2.1, 1.16.22.1.2.1, 1.16.35.1.2.1, 1.16.36.1.2.1	7. Ensure system is in place as part of Onsite Emergency Response plan to control & contain gaseous mixture at Incident location (like use of multiple fire water monitors and multiple Mayura curtains), thereby minimizing onsite and offsite environment impact to minimum level	Process / Safety	R4	Closed	
Cat: 1.16.21.1.1.1	8. Provide PAH on steam line set at 9 kg/cm2	Technical Services	R2	Closed	
Cat: 1.16.21.1.1.1, 1.16.37.1.1.1	9. Provide high Pressure alarm on PIC 2832, set point to be kept at level not exceeding normal operating pressure T- 2202 bottom	Inst	R2	Closed	
Cat: 1.16.28.1.1.1	10. Recommended to close LV-2212 on LALL	Inst	R3	Closed	

Cat: 1.16.36.1.1.1, 1.16.36.1.2.1	11. Identify PSM Critical equipment list and develop MI Program	Engineering	R3	Closed	
Cat: 1.16.36.1.1.1, 1.16.36.1.2.1	12. Ensure Comprehensive MIQA plan	Engineering	R3	Closed	
Cat: 1.28.27.1.1.1	13. Prevent Exposure of T-2404 to direct sunlight.	Process	R3	Closed	

VAKALATNAMA

BEFORE THE NATIONAL GREEN TRIBUNAL

WESTERN ZONE BENCH, PUNE

ORIGINAL APPLICATION NO. 02/ 2025 (WZ)

IN THE MATTER OF:

Ashutosh Kumar ....Applicant

Versus

Gujarat Fluorochemicals Ltd. & Ors. ....Respondents

We, Gujarat Fluorochemicals Limited, through our authorised representative, do hereby appoint

Mr Ajay Bhargava, Mrs Vanita Bhargava, Mr Amit Avinash Agashe, Mrs Nandini Chauhan, Ms Tijil Thakur, and Mr Rohan Kharche

Advocates of **Khaitan & Co LLP, Advocates, 11th Floor, Ashoka Estate, 24, Barakhama Road, New Delhi 110 001,** to be our lawful Counsel and attorneys in the above case, to appear and represent us in the said Tribunal to make statement of claim, any application or verification, to conduct and prosecute the above case, to deposit to enter satisfaction on my/our behalf, to file and receive back any documents, papers or books filed as exhibits to make and appear in any application for new trial, to apply for execution of decree, to issue any process, to draw out money from Court, to issue any commission or commissions respecting the above case, to examine and cross examine any witness, any if necessary, to appeal from the order of the said Court to any higher Tribunal and Tribunals and there to appear, plead and act for me/us whether as appellant/s or respondent/s as the case may be, and to do all and every and any other acts, deeds, matters and things whatsoever in or about the premises as fully and effectually to all intents and purposes as I/We could do if personally present. We hereby ratify and confirm all and whatsoever the said, Khaitan & Co., Advocates shall lawfully do or cause to be done in or about the premises by virtue here of any also agree to pay

the costs, charges and expenses including your fees which may be raised by you from time to time.

In witness whereof we have hereunto set my/our hands/s this 5th day of June 2025.

Respondent No. 1

Gujarat Fluorochemicals Ltd DAHEJ

Accepted Advocates

Through Director/Authorised Representative

Ajay Bhargava [D/186/1997(R)]	Vanita Bharagava [D/587/1998(R)]	Amit Agashe [MAH/99/2006]
Nandita Chauhan [D/3814/2014]	Tijil Thakur [D/4142/2021]	Rohan Kharche [MAH/1689/2020]

PROOF OF SERVICE

From:	Rohan Kharche
To:	sshooda65@gmail.com; aeronaayushman@gmail.com; chiefsecretary@gujarat.gov.in; chairman-gpcb@gujarat.gov.in; maulik@nanavatico.com; pushkalm6@gmail.com; dish-ahd@gujarat.gov.in; collector-bha@gujarat.gov.in; ccb.cpcb@nic.in; secy-moef@nic.in; ngt@mgklegal.com
Cc:	ngt-pune@gov.in
Subject:	Service | Reply Affidavit - R1 Gujarat Fluorochemicals Limited | OA 02-2025 NGT (WZ) Pune
Date:	07 June 2025 12:25:14
Attachments:	R1_GFL Reply Affidavit_OA No 02 2025.pdf

Dear Sir

We are concerned for our client Gujarat Fluorochemicals Limited, the Respondent No. 1 in OA No. 02 of 2025 (Shri Ashutosh Kumar vs Gujarat Fluorochemicals Limited & others).

Enclosed herewith is the Reply Affidavit of Respondent No. 1 in OA No. 02 of 2025, as and by way of service upon you.

Kindly note that the present e-Mail shall be filed before the Hon'ble NGT (WZ) as proof of service.

Regards

Rohan Kharche
Associate

7th Floor, Panchashil Avenue, Plot No. 71, Kalyani Nagar-Wadgaon Sheri Rd., Yerwada, Pune, 411 006, India
M: +91 9404426995 | E: rohan.kharche@khaitanco.com | Business Card | www.khaitanco.com

Rohan Kharche
Associate

7th Floor, Panchshil Avenue, Survey No 210, Plot No 71, Kalyani Nagar- Wadgaon Sheri Rd, Wadgaon Sheri Rd, Next to Marigold Complex, Yerawada, Pune 411006 India

T: +91 020 69048000 | M: +91 94044 26995 | E: rohan.kharche@khaitanco.com | Business Card | www.khaitanco.com

Chambers Global 2024 Top Ranked Leading Firm
IFLR 1000 2024 Top Tier Firm
Legal 500 2025 Top Ranked Firm
IBLJ India Law Awards 2024 Best Overall Law Firm

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