REPORT OF COMMITTEE
IN COMPLIANCE OF ORDER OF HON'BLE NGT, PRINCIPAL BENCH NEW DELHI
IN THE MATTER OF OA NO. 22 Of 2020
(ARYAVART FOUNDATION V/s YASHYASHVI RASAYAN PVT. LTD. & ANR)
WRT FATAL ACCIDENT
AT
M/S YASHASHVI RASAYAN PVT. LTD.
DAHEJ, GUJARAT

(As per order of Hon'ble National Green Tribunal, Principal Bench, New Delhi Dated 08.06.2020)

UNDER THE CHAIRMANSHIP OF JUSTICE B.C. PATEL, FORMER CHIEF JUSTICE, DELHI HIGH COURT AND FORMER JUDGE OF THE GUJARAT HIGH COURT

Prepared By

Ministry of Environment, Forest & Climate Change

FOR SUBMISSION TO

HON'BLE NATIONAL GREEN TRIBUNAL,
PRINCIPAL BENCH, NEW DELHI

AUGUST 2020

REPORT OF COMMITTEE IN COMPLIANCE OF ORDER OF HON'BLE NGT, PRINCIPAL BENCH, NEW DELHI IN THE MATTER OF OA NO. 22 Of 2020 (ARYAVART FOUNDATION V/s YASHASHVI RASAYAN PVT. LTD. & ANR) WRT FATAL ACCIDENT AT M/S YASHYASHVI RASAYAN PVT. LTD. DAHEJ, GUJARAT

(As per order of Hon'ble National Green Tribunal, Principal Bench,

New Delhi Dated 08.06.2020)

COMMITTEE MEMBERS

Hon'ble Justice Shri B.C. Patel, Former Chief Justice, Delhi High Court and former Judge of the Gujarat High Court, Ahmedabad	
Shri Vishwa Bandhu Meena Ministry of Environment, Forest & Climate Change, Regional Office, Bhopal	Ministry of Environment, Forest & Climate Change
Shri Pratik D. Bharne Central Pollution Control Board (CPCB), Regional Directorate (West), Vadodara	
Prof. Chinmay Ghoroi Indian Institute of Technology (IIT) Gandhinagar	
Dr. K V George Senior Principal Scientist & Head, Air Pollution Control Division, NEERI, Nagpur	
Shri Ashish K Panda, Consultant, National Institute of Disaster Management (NIDM), New Delhi	

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COMMITTEE MEMBERS

Name	Institute	Signature
Hon'ble Justice Shri B.C. Patel	Former Chief Justice, Delhi High Court and former Judge of the Gujarat High Court, Ahmedabad	
Shri Vishwa Bandhu Meena	Scientist 'C' Ministry of Environment, Forest & Climate Change, Regional Office, Bhopal	
Shri Pratik D. Bharne	Scientist 'E' Central Pollution Control Board (CPCB), Regional Directorate (West), Vadodara	
Prof. Chinmay Ghoroi	Professor of Chemical Engineering Indian Institute of Technology (IIT) Gandhinagar	
Dr. K V George	Senior Principal Scientist & Head, Air Pollution Control Division, NEERI, Nagpur	
Shri Ashish K Panda	Consultant, National Institute of Disaster Management (NIDM), New Delhi	

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1.0 PREAMBLE

Hon'ble National Green Tribunal (NGT), Principal Bench, New Delhi passed an order in the matter of Aryavart Foundation (hereinafter referred as applicant) V/s Yashyashvi Rasayan Pvt. Ltd. & Anr [O.A. No. 22 of 2020] on 08th June, 2020 regarding the explosion and fire took place on 03.06.2020 at M/s Yashyashvi Rasayan Pvt. Ltd., (hereinafter referred as Unit) Dahej, Dist: Bharuch, Gujarat resulting into death of 11 workers, several injured and destruction of properties of industries and houses in nearby village.

Hon'ble NGT issued the following directions as per order 08.06.2020 (**APPENDIX-1**)

- **DIRECTION FOR THE COMPANY (YASHYASHVI RASAYAN PVT. LTD.) AND THE DISTRICT MAGISTRATE, BHARUCH.**

  Relevant para 12 a, is reproduced as-

  "12 a) The Company may deposit an amount of Rs. 25 crores, minus the statutory compensation/ex gratia payments already made to the victims, if any, with the District Magistrate, Bharuch within 10 days from today. The amount may be disbursed by the District Magistrate by making disbursement plan in the manner already indicated above (Para 6). Disbursement plan may consider safeguards to ensure that amount reaches the beneficiaries and is not misappropriated by any intermediary."

- **CONSTITUTION OF SIX MEMBER COMMITTEE**

  Relevant para 12 b, 12 c & 12 e are reproduced as -

  "12 b) We constitute a 6-member Committee comprising:

  (i) Justice B.C. Patel, former Chief Justice, Delhi High Court and former Judge of the Gujarat High Court presently stationed at Ahmedabad - Chairman

  (ii) Representative of MoEF&CC – Member

  (iii) Representative of CPCB – Member

  (iv) Head of the Chemical Engineering Department of the IIT Gandhinagar - Member

  (v) Representative of NEERI - Member

  (vi) Representative of National Institute of Disaster Management, IIPA Campus, New Delhi – Member

  "12 c) The Committee may visit and inspect the site within 7 days and give its report within one month thereafter via email judicial-ngt@gov.in, (preferably in the form of searchable/OCR PDF and not image PDF). The Committee may specifically report:

  i. The sequence of events;

  ii. Causes of failure and persons and authorities responsible therefor;

  iii. Extent of damage to life, human and non-human; public health; and environment – including, water, soil, air;

  iv. Steps to be taken for compensation of victims and restitution of the damaged property and environment, and the cost involved;

  v. Remedial measures to prevent recurrence;

  vi. Any other incidental or allied issues found relevant

  - *The Committee will be at liberty to take assistance of such experts, individuals and institutions as may be considered necessary*
  - *CPCB will be the nodal agency for coordination.*
  - *The Committee may provide opportunity of being heard to the Company as well as any other member of the public.*

  "12 e) The Committee may as far as possible make final quantification of compensation and also prepare a restoration plan in association with the District Magistrate, Bharuch. For the restoration plan, the nodal agency will be the representative of MoEF&CC."

- **DIRECTION TO THE CHIEF SECRETARY, GUJARAT**

  Relevant para 12 f, is reproduced as-

  "12 f) The Chief Secretary, Gujarat may identify and take appropriate action against persons responsible for failure of law in permitting the Company to operate without statutory clearances within two months and give a report to this Tribunal."

- **DIRECTION TO COMPANY**

  Relevant para 12 g, is reproduced as-

  "12 g) In view of the stand of the State PCB that the order of closure has been passed, before recommencing any operations, the Company may bring it to the notice of this Tribunal, so that it can be ensured that there is no violation of statutory provisions and safety measures."

2.0 CONSTITUTION OF THE COMMITTEE:

In compliance to the order (para 12 b) of the Hon'ble NGT, six member committee constituted with following members-

01	Hon'ble Justice Shri B.C. Patel, Former Chief Justice, Delhi High Court and former Judge of the Gujarat High Court, Ahmedabad	Chairman
02	Shri Vishwabandhu Meena, Scientist 'C', MoEF & CC, Regional Office, Bhopal	Member
03	Shri Pratik Bharne, Scientist 'E', CPCB, Regional Directorate, Vadodara	Member
04	Prof Chinmay Ghoroi, Department of Chemical Engg, IIT, Gandhinagar	Member
05	Dr K V George Senior principal Scientist & Head, Air Pollution Control Division, NEERI, Nagpur	Member
06	Shri Ashish K Panda, Consultant, National Institute of Disaster Management (NIDM), New Delhi	Member

3.0 APPROACH

The committee adopted following approach in compliance of the order of the Hon'ble NGT:

- Meeting among the members and meeting/information sharing of concerned departments viz Directorate of Industrial Safety & Health (DISH), Petroleum And Explosives Safety Organization (PESO), Gujarat Pollution Control Board, District Magistrate and Police
- Site and surrounding visits
- Public and Company hearing
- Report preparation based on the above

4.0 ABOUT THE UNIT-WHERE FATAL ACCIDENT TOOK PLACE

M/s Yashyashvi Rasayan Pvt. Ltd., a Patel group company, was established in 2017 and engaged in manufacturing of Herbicides and its intermediates. The factory is located at Plot. No. Z/96/E, SEZ:II, Dahej Industrial estate, Tal: Vagra, Dist: Bharuch, Gujarat. The location of the industry and surrounding area is given in Google Image-1, 2 & 3. The photographs of the accident site are given at **APPENDIX-2.**

4.1 DAHEJ INDUSTRIAL AREA:

Dahej is located in Vagra talulka of western part of Bharuch District (about 50 km from Bharuch), near Gulf of Cambay (khambat), Gujarat. The Vagra takuka is having industrial areas –Dahej GIDC (Phase-1/D-1, D-2 & D-3), Dahej SEZ (Part-I & Part-II), Vilayat GIDC & Saykha GIDC. There are onsite chemical port terminals, LNG terminals, Jetties of industries (Hindalco-Copper, Reliance Ind. Ltd.-petrochemicals, Adani- Coal etc).

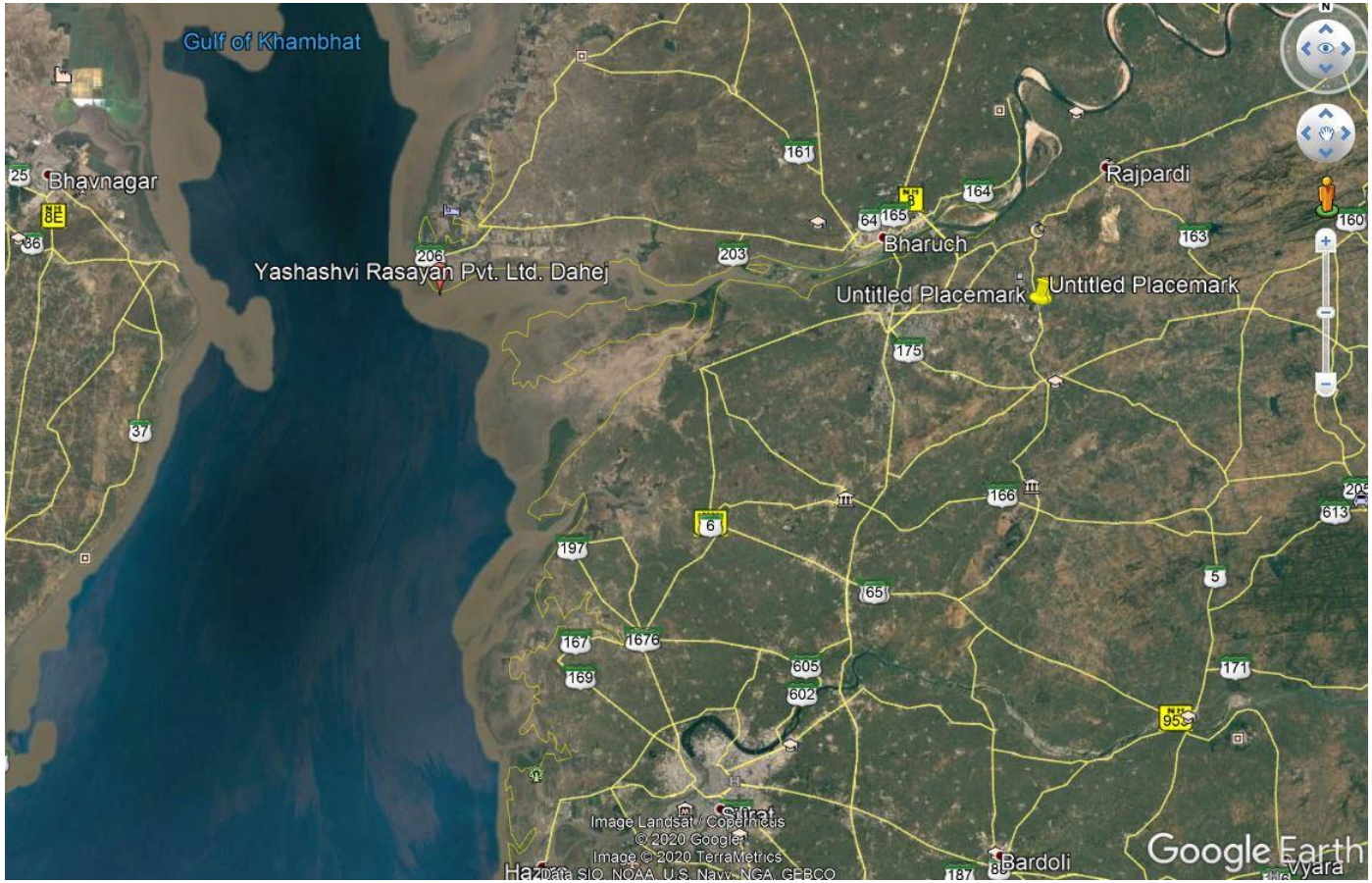
Dahej SEZ Ltd. (DSL) is a company registered under the companies act, 1956 and is promoted jointly by Gujarat Industrial Development Corporation (GIDC) and Oil & Natural Gas Corporation (ONGC) for development of Special Economic Zone (SEZ).

SEZ is a part of Dahej Petroleum, Chemicals and Petrochemicals Investment Region (PCPIR) and is within Delhi-Mumbai Investment Corridor (DMIC). PCPIR is a specifically delineated investment region planned for the establishment of production facilities for petroleum, chemicals and petrochemicals.

There are 269 industries (Scale wise- Small-85, Medium-26, large-158, Category wise-Red-185, orange-46 & Green-38) presently operational in the Taluka Vagra including Dahej GIDC, Dahej SEZ and Vilayat/Saykha Industrial area. 17-category industries operational in the area are 49. The major industries in the area are – Gujarat Alkali & Chemicals Ltd (Chlor-alkali), Hindalco Ind Ltd (copper Smelter), Reliance Ind Ltd-petrochemicals, ONGC Petro additions Ltd (OPaL), Gujarat Flourochemicals Ltd., Meghmani Organics Ltd. There are five jetties in operation in the area.

4.2 Nearby Villages:

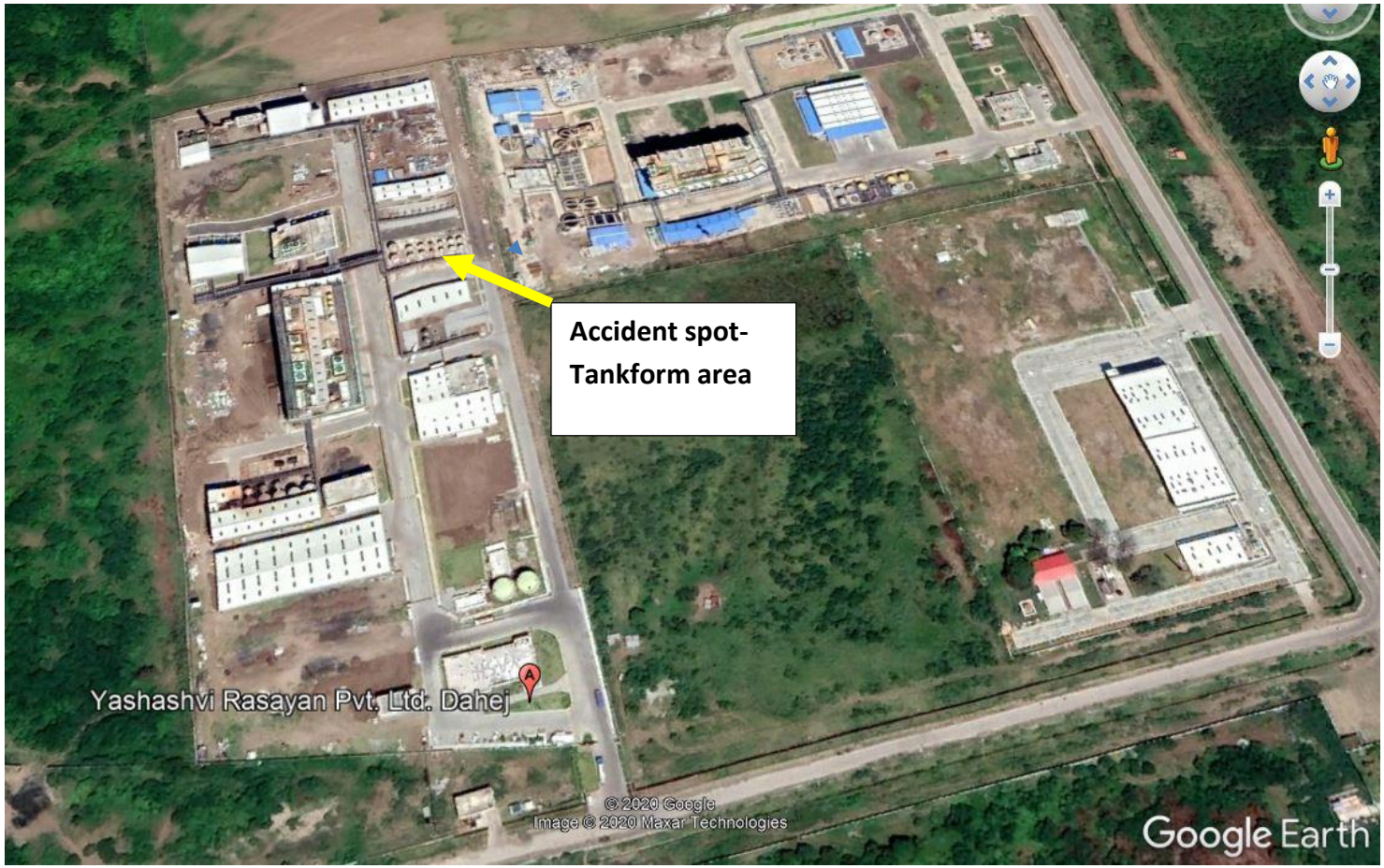
There are two villages Luhara (about 600 m distance from the accident site in north –east direction) and Lakhigam (about 2.25 km distance from accident site in almost north direction) which are nearby to the Accident Site i.e. M/s Yashashvi Rasayan Pvt Ltd. The Ambheta village is @ 5 km from accident site in north –east direction. The Sea (Gulf of Cambay) about 1.25 km in South and West direction of the unit.



Google Image-1 District Place Bharuch & Dahej (M/s Yashashvi Rasayan Pvt Ltd) (@ 55 km)

Report drawn by the Committee in view of the order made by the Hon'ble National Green Tribunal in the matter of explosion dated 3rd June 2020 in the premises of M/s Yashashvi Rasayan Pvt Ltd, at Dahej Dist Bharuch

Google Image-2 showing industry and nearby villages-Luvara, Lakhigam, Ambheta



Google image-3 showing M/s Yashashvi Rasayan Pvt Ltd and nearby industries

5.0 ACTIVITIES CARRIED OUT BY THE COMMITTEE:

- Meeting among the members and GPCB on 11.06.2020 at GPCB, Gandhinagar
- Meeting with Collector, DSP, DISH, PESO officials and Site visit on 16.06.2020 at Dahej
- Meeting among the members and along with officials of GPCB, DISH, PESO, District Administration on 28.06.2020 at GPCB Gandhinagar
- Public hearing and site visit on 29.06.2020 at Dahej
- Meeting for the finalization of the Report on 01.08.2020 & 02.08.2020 at GPCB Gandhinagar

6.0 SUMMARY OF THE REPORT

6.1 THE SEQUENCE OF EVENTS: -

The unit having an authorisation to use the material except hydrogen gas, was found manufacturing the chemicals. On the 2nd June, 2020 the chemicals known as DMS and Nitric Acid brought by different tankers were to be unloaded. Without following the strict procedure for downloading the chemicals which are hazardous, the person not operating as an operator in the tank farm area unloaded the material however, the Nitric Acid was unloaded in the tank of DMS and the DMS was unloaded in the tank of Nitric Acid. Despite the knowledge of mixing of incompatible chemicals, the chemical engineers of the unit did not think it fit to shut down the plan but on the contrary continued their activities and even on the next day the unit operated on 3rd June, as usual. The mixture on account of heating in view of the nature of the chemicals, exploded and the fire took place as

a consequence 11 persons died, many sustained grievous hurt and many sustained simple hurts.

6.2 CAUSES OF FAILURE AND PERSONS AND AUTHORITIES RESPONSIBLE: -

From the report, it is clear that the management as a whole is responsible for allowing the person not appointed as a tank farm operator to unload the chemicals, when they were aware that the tank farm operator left the tank farm area. The proper procedure was not followed while unloading the chemicals. Even the senior officers who came at the tank farm and discussed the subject of mixing of the chemicals failed to take appropriate action as required and allowed the unit to operate as usual. In view of this it is clear that not only the operators but the officers present who discussed and permitted to operate the plant are also equally responsible. They are also responsible as they failed to report to the authorities about the mixing of the chemicals to avoid the accident. It appears that there is no role of any government official to fasten with the liability except the role of the DISH which permitted the storage of incompatible chemicals and did not bother about automatic temperature measure system along with the siren/hooter in case the temp rises beyond a limit.

6.3 EXTENT OF DAMAGE TO LIFE, HUMAN AND NONHUMAN; PUBLIC HEALTH AND ENVIRONMENT-INCLUDING WATER, SOIL, AIR;

So far as the damage of the life, human and non-human is concerned, it is clear that 11 persons lost their lives and 22 persons sustained grievous hurt, 28 persons sustained simple hurt and 43 persons sustained minor injury as per the list forwarded by the office of the Collectorate. Heirs of three deceased have not been paid anything so far. Heirs of 5 deceased got Rs.15 lacs each or more. Heirs of three deceased got partial benefits.

On account of non-receipt of disability certificate, the committee could not calculate the compensation on account of injury. The members of the committee on receipt of the disability certificate will submit the entitlement of the persons who sustained grievous hurt. It seems that the device is adopted by indicating simple hurt and minor injury with a view to avoid the payment of ₹2.5 lakhs to the person who sustained an injury. According to the latest information 71 persons sustained simple hurt and the committee is of the view that all must be paid as per order made by the Hon'ble Tribunal.

There is nothing to indicate that any nonhuman (animals) sustained an injury or even died.

So far as the damage to the environment on account of wastewater (water used in fire fighting) is concerned the committee is of the opinion that no damage has been caused on account of wastewater in view of the expert's opinion. In view of the expert's opinion and other material reflected in the report it is clear that there is no damage to the soil.

So far as the damage to the environment on account of the air pollution is concerned, the expert member has requested for some time and the committee will be in a position to submit on this behalf on receipt of the opinion from the expert member indicating the damage caused on account of air pollution.

At present, in absence of damage to the environment on account of water and soil it can be said that no damage has been caused to the environment, however, on receipt of the report about the air pollution, the committee will submit the report as indicated in the detailed report.

The committee has considered the matter with regard to the compensation to the heirs of the victim. As indicated above, even the amount as directed by the Hon'ble Tribunal has not been paid to all concerned including the amount to be

paid to the displaced persons. Under the circumstances, the District Collector should be asked to recover the amount in view of the order that is made by the Hon'ble Tribunal by taking appropriate actions (under the Land Revenue Code) The committee has assessed the damage to be paid to the next of kin of the deceased, the Hon'ble tribunal be please to make an appropriate order or direction for recovery of the same as deemed just and proper.

The committee has expressed an opinion with regard to the damages to be paid to the others, however on account of damage caused to the property, in absence of acceptable evidence it was not possible for the committee to recommend for damage caused to the property of the persons (Industries). However, so far as villagers are concerned it appears that the damages have been paid as per the list received from the District Collectorate.

6.4 REMEDIAL MEASURES TO PREVENT RECURRENCES: -

The committee has discussed this aspect in detail in the report. In the recommendation (Section-12) all these aspects have been taken into consideration and therefore on this subject request is that our recommendations be considered as remedial measures to prevent recurrences.

6.5 OTHER ALLIED ISSUES FOUND RELEVANT:-

Effluent Management in Dahej Industrial Area-

Most of the industries in Dahej- Vilayat area are discharging treated wastewater in to internal drainage network (39 km) provided by GIDC having pumping stations (4 nos.) and earlier finally used to pump to deep Sea through underground pipeline (90 MLD capacity, present flow @ 39 MLD) from Final Pumping Station (FPS). The length of this disposal pipe line is 13.5 km out of which 9 km on- shore and 4.5 km off-shore. The final disposal point was identified by the

National Institute of Oceanography (NIO). However, presently, the wastewater is being reportedly discharged only at 600 m inside (with 600 m off-shore separate pipeline) the Sea, instead of 4.5 km due to damage/choking of 4.5 km off-shore pipeline/diffuser system. The 600 m off-shore pipe in use is reportedly having leakages at a number of locations discharging effluent in between High Tide Level (HTL) & Low Tide Level (LTL).

The effluent discharged from Final Pumping Station is not meeting prescribed norms as per CPCB & GPCB monitoring results. It is inferred that the individual industries are not treating the effluent as per standards prescribed by GPCB and letting wastewater without proper treatment into the GIDC drainage system.

There are industrial clusters like GIDC Dahej, (D1,D2,D3, Dahej SEZ Part I and Part II and Vilayat GIDC and SAYKKA GIDC) in Vagra Taluka. There is one CETP (For Dahej D2 and D3, Capacity 40 MLD) under stabilisation, while another one is for Saykha GIDC 40MLD already constructed but not commissioned. Others have no facilities of CETP. As such there is no functional CETP and all discharging the trade effluent either treating or otherwise in drains of GIDC. In view of the reports it can be said that some industries are not treating the trade effluent.

GPCB has till now issued three directions to GIDC under Section-33 A of the Water (P & CP) Act, 1974 dated 30.01.2019, 23.03.2020 and 27.05.2020 for violation and non-compliances viz. discharge of effluent in intertidal zone through 600 m separate off-shore pipeline instead of 4.5 km off-shore pipeline due to choking of pipeline violating CCA condition/CRZ Notification, non-compliance of discharge standards at Final Pumping Station (FPS), heavy sludge deposition at FPS, overflowing of manholes due to choking/leakage problems of GIDC drainage lines, frequent overflowing of effluent from manholes leading to storm water drains/natural drains which ultimately carry effluent to estuary of River Narmada & to the Sea, accumulation of effluent in some areas etc.

As per latest direction issued by GPCB dated 27.05.2020, GIDC has been directed to:

- Submit compliance report of the direction issued on 23.03.2020 and time bound action plan for remediation of choked effluent disposal pipeline,
- Stop discharge of effluent in tidal zone (near the Sea coast)
- Provide sludge removal mechanism and remove heavy sludge deposition in FPS
- Stop overflowing of manholes which is taking place due to choking and leakage problem
- Collect & dispose wastewater accumulated due to leakage & seepage from GIDC drainage line and overflow from drainage manholes

The copy of directions dated 23.03.2020 & 27.05.2020 have been marked to Gujarat Coastal Zone Management Authority (GCZMA) for taking appropriate actions for violation of CRZ Notification by GIDC regarding discharge of effluent into the estuary of Narmada.

GIDC has submitted reply to the GPCB and informed that-

- GIDC commissioned 4.5 km CS pipeline of 1000 mm diameter in 2016-17, due to scaling in the pipeline and diffusers were buried more than 3 meters in the sea bed. Also, it is not possible to repair diffusers and removal of scaling in offshore pipelines. Hence, effluent could not be discharged into the deep sea.
- GIDC has laid two rows of 600 mm diameter MS pipeline up to 600 meters. GIDC has planned to lay a new offshore pipeline with diffusers

for which a consultant has been appointed and estimates are prepared but it will take at least 2.5 years to complete the said work.

- GIDC has attended leakages of pipelines.

From what is stated above it is clear that since 2016 – 2017 the effluent is being discharged just a distance of 600 meters. It is required to be borne in mind that the effluent is of the industries engaged in manufacturing hazardous chemicals or using hazardous chemicals. The industries through GIDC cannot be permitted to discharge the effluent not meeting with the norms just at a distance of about 600 m in the sea instead of 4.50 Kilo Meters as per permission granted.

7. FINDINGS, OBSERVATIONS AND RECOMMENDATIONS

(Please, refer Section wise Detail Report)

SECTION 1
THE ORDER OF THE HON'BLE TRIBUNAL

1. M/s. Yashashvi Rasayan Pvt. Ltd, (hereinafter referred as 'the unit') situated at, Plot No. Z/96/E, SEZ-II, Dahej, Taluka Vagra, District Bharuch, is engaged in manufacturing of varieties of chemicals/acids since 2017 manufacturing (1) 3,6 Di Chloro 2 Methoxy Benzoic Acid 500 MT **or** (2) Di Potassium Salt of 3,6 Di Chloro Salicylic Acid 701.5 MT **or** (3) 2,5 Di Chloro Phenol 510.92 MT **or** (4) 2,5 Di Chloro Aniline 664.75 MT, (5) Nitrosyl Sulfuric Acid and other by-products. The Raw materials used for these items in April, 2020 to 2nd June,2020 and the important raw materials for the products, the unit manufactured is indicated in an Annexure Mark **Annexure 1**. The competent authorities under different Acts granted consent, permission or license to the unit are annexed here with and Mark **Annexure 2.**

2. During the declaration of epidemic COVID-19, in view of the permission granted by the authorities on 25th March, 2020 and 20th April, 2020 the unit operated. On account of an explosion and fire which took place during the noon of 3rd June, 2020 in the premises of the aforesaid unit, about 11 persons died and many sustained injuries. It is also clear that after the incident, there was shutdown of the plant. In view of the incident having taken place, Aryavart Foundation through its President moved the Hon'ble National Green Tribunal by preferring Original Application No. 22/2020 (WZ) and the Hon'ble Tribunal issued certain directions as under: -

"12. Having regard to the facts and circumstances of the present case and in the light of material available on record and without prejudice to further opportunity being given to all concerned, we find it necessary to issue following directions:

a) ***The Company may deposit an amount of Rs. 25 crores, minus the statutory compensation/ex gratia payments already made to the victims, if any, with the District Magistrate, Bharuch within 10 days from today.*** The amount may be disbursed by the District Magistrate by making disbursement plan in the manner already indicated above (Para 6). Disbursement plan may consider safeguards to ensure that amount reaches the beneficiaries and is not misappropriated by any intermediary.

b) We constitute a 6-member Committee comprising:

(i) Justice B.C. Patel, former Chief Justice, Delhi High Court and former Judge of the Gujarat High Court presently stationed at Ahmedabad - Chairman

(ii) Representative of MoEF & CC – Member

(iii) Representative of CPCB – Member

(iv) Head of the Chemical Engineering Department of the IIT Gandhinagar - Member

(v) Representative of NEERI - Member

(vi) Representative of National Institute of Disaster Management, IIPA Campus, New Delhi – Member

The District Magistrate, Bharuch and GPCB will provide logistic support to the Committee to enable their fact-finding and reporting. The Committee will be at liberty to take assistance of such experts, individuals and institutions as may be considered necessary.

SECTION 2

INSPECTION AND EVIDENCE

3. In view of the directions issued by the Hon'ble Tribunal, the 1st meeting of the members of the committee was held at Gandhinagar, on 11th June, 2020. 1) Shri Pratik Bharne, Scientist-E, CPCB, 2) Shri Chinmay Ghoroi, Head of the Chemical Engineering Department, I.I.T. Gandhinagar were present. While 1) Dr K V George, Sr. principal Scientist & and Head APC Division, NEERI, 2) Shri Ashish K Panda, Consultant, Representative of National Institute of Disaster Management, New Delhi and 3) Shri Dinesh Runiwal, Additional Director (Sc-E), on account of prevailing situation were not able to remain present and hence, through videoconferencing they participated. A decision was taken to visit the unit on Tuesday, 16th June, 2020 at 9:30 AM despite the problems being faced.

4. Accordingly, all the Members of the Committee including the Chairman of the Committee visited the unit on the date and time fixed. They were accompanied at the site by the 1). Collector and District Magistrate, Bharuch 2). Superintendent of Police, Bharuch 3). Member Secretary, GPCB 4). Regional Director, CPCB, Vadodara, 5) Sub Divisional Magistrate, Bharuch 6). Regional Officer, GPCB, Bharuch 7). Dy. Director, Directorate of Industrial Safety and Health (DISH), Bharuch 8). Assistant Director, Chemical Department, DISH 9). Police Inspector, Dahej Police Station 10). Officials from Petroleum and Explosives Safety Organization (PESO) and 11) Representative of the units.

5. For public hearing, the District Collector issued a public notice in the daily newspapers published on 20-06-2020 in vernacular in daily 'SANDESH'

'DIVYABHASKAR' and 'GUJART SAMACHAR' widely circulated in the area of the accident as well as in Gujarat, to afford an opportunity to the public for hearing on 29-06-2020 with a view to know the extent of damage to life, human and non-human; public health; and environment – including, water, soil, air; and, steps to be taken for compensation of victims and restitution of the damaged property and environment, and the cost involved.

6. At the time of hearing possibly on account of short of time, sudden death as a result of the explosion, and on account of distance and the circumstances prevailing on account of COVID-19, the persons from the family of the deceased may not have remained present. So far as the persons sustained injuries on account of blast are concerned, none remained present or even on behalf of any injured, none remained present. In all 18 persons appeared to give evidence in view of the Public Notice issued by the District Collector. Their evidence is annexed herewith collectively Mark **Annexure 3**. The unit submitted a statement as on 12th June, 2020 against the payment to be made to the deceased. Only ₹50 lakh were paid. The persons who sustained grievous hurt were paid the sum of ₹3,62,566/- and the persons who sustained injuries other than grievous hurt were paid only the sum of ₹10,01,116/-. Against the total payment of ₹2,67,50,000/- only the sum of ₹63,63,682/- have been paid. Out of the (11) persons who died, 8 persons were from state of Bihar while only 2 persons were from Bharuch District. Out of the 4 persons who sustained grievous hurt only one was from the State of UP and others were Local. The Hon'ble Tribunal in **paragraph 6** of the order observed while directing to make interim payment as under: -

> *"we assess interim compensation for death to be 15 lacs each (taking into account multiplier of around 16 and loss of earning of about one lac a year, taking the minimum wage, apart from conventional sums), for grievous injury Rs. 5 lac per person, for other injuries of persons hospitalized Rs. 2.5 lac per person and for displacement at Rs. 25000/- per person. The company may make an interim deposit of Rs. 25 Crores excluding the deposit/payment already made in pursuance of order of the GPCB or otherwise or under the Workmen's Compensation Act, 1923 or*

any other statutory provisions or ex gratia in relation to the present incident. Disbursement may be made by preparing an appropriate plan by the District Magistrate in consultation with the District Legal Service Authority, Bharuch to be overseen by the Member Secretary, State Legal Service Authority. The amount may be deposited within 10 days from today."

7. Therefore, by way of an interim order an amount as directed was required to be deposited and disbursed. The amount as directed has not been deposited till the date of evidence i.e. 29th June,2020. The amount required to be paid under the provisions contained in the Workmen Compensation Act or under the scheme of GPA or Ex Gratia amount or the benefit available under any other Scheme or Act is different. However, for an interim measure to provide assistance by way of interim relief the amount is to be deposited as ordered by the Hon'ble Tribunal, so that the Collector may disburse the amount to the heir of deceased person who died in an accident or to a person who sustained grievous hurt or hurt. The statement supplied by the unit indicates some disbursement of the amount under the head full and final settlement, total compensation amount (WC. GPA. & Ex Gratia), however, there is nothing to show what amount or what part of amount is paid in view of the directions. Only 4 persons according to the unit are shown to have sustained grievous hurt but nothing is paid. According to the unit in all 39 persons were treated for injuries and some were discharged within 2/3 days while 9 were in the hospital under treatment. In some cases, amount for treatment is indicated but what amount is paid is not shown. Some cases are under process. Thus, there is nothing to show that the amount has been paid as per the order of the Hon'ble Tribunal. The said statements are annexed herewith and Mark **Annexure 4**. However as per the latest report of the Collector the amount paid is referred in para **82**.

SECTION 3

STORAGE, MANUFACTURE, APPLICABLE PROVISION AND SAFETY REPORT

8. A company known as Safe Process Engineering Pvt Ltd, having its office at Western Business Park, Vesu, Surat with a team of its engineers visited the unit and after inspection of the unit submitted Safety Audit Report of the unit on 14th March, 2020. Which is in detail.

9. The unit has 11 underground tanks for storage of Methanol, recovered, Xylene and Diesel. The unit has 14 tanks on ground to store Sulphuric acid, Sodium hydroxide, Potassium hydroxide, Nitric Acid, O.D.C.B., D.C.N.B., Dichloro Aniline, Dimethyl Sulphate, Sulphur dioxide, Carbon Dioxide (Gas). It has a hydrogen bank, two-storey hydrogen cylinders on vehicles. There are different methods for the product produced by the unit.

10. The manufacturing process of this unit falls under item No. 17 and 18 of the First schedule of the Factories Act, 1948 and the nature of the manufacturing process falls under section 2 (cb) of the said act. The unit is engaged in process which is "Hazardous Process". Provisions contained in Chapter 4- A of the Factories Act, 1948 and Rules 68-K to 68-Y of the Gujarat Factories Rules, 1963 would apply. In view of certain chemicals used, Rule 68-J of the Gujarat factories Rules 1963 will be attracted and in view of this also the unit is using" Hazardous Chemicals". The unit is engaged in hazardous process listed at serial No. 17, 80 and 29 of the 1st schedule of the Factories Act, 1948 and therefore, not only the manufacturing process is required to be carried out strictly in a scientific method, but is also required to observe certain norms very strictly as prescribed by the authorities even while receiving Hazardous Chemicals. The unit is thus classified as a MAH (Major Accident Hazard) Installation. In view of the use of various chemicals, Schedule 12 and 19 of

Rule 102 of the Gujarat Factories Rules, 1963 will apply and the unit is required to provide, housekeeping, prohibition on the use of food at workplace, authorised entry, examination of the instruments and safety devices, facility for isolation, protective equipment, test, examination and repair of plant equipment with permit for entry into or work in confined spaces and PTW system and all the requirement for prevention of fire and explosion as applicable. In the activities being undertaken in the unit (Welding/cutting Operation with the use of LPG/Acetylene/Argon), the Rule 102 of the Gujarat Factories Rules, 1963 is required to be complied with. The provisions contained in the aforesaid Act and Rules, including sections 28, 29, 30 and 31 and Rules 58, 59, 60 and 61 being applicable, the unit has to strictly follow all the provisions and mandatory Forms No. 9,10 and 11 has to be maintained.

11. The Chemical Accidents (EPPR) Rules 1996 are applicable in view of the quantities of the hazardous chemicals stored more than the threshold quantities indicated in the Rules. In view of this, the unit is classified as MAH installation units and should become a member of the Local Crisis Group and District Crisis Group of Off-site Emergency Plan made for the local area and the District area.

12. In view of the boiler being used by the unit, the provisions contained in the Boilers Act, 1923 and the Gujarat Boilers Rules, 1966 are applicable. In view of the use of hazardous chemicals being used by the unit, when the hazardous chemicals brought through tankers, the unit is required to see that Rules 129 to 137 of the Motor Vehicle Rules, 1989 are complied with. There is a mandatory provision to display the prescribed class of labels for the chemical, techno graph on motor vehicle, use of spark arrester etc should be complied with. The unit has to see that the tankers with requisite markings are allowed to enter the unit premises.

13. The provisions contained in the Petroleum Act, 1934 and the Petroleum Rules, 2002 are applicable to the unit as the unit is storing in bulk Petroleum Class A and Petroleum Class B in bulk. In view of the use and storage of Carbon Dioxide, the Static and Mobile Pressure Vessel (unfired) Rules are also made applicable to the unit. As per the report, the unit is using Sulphur dioxide, a toxic gas, the unit is also governed under the Gas Cylinder Rules, 2016. For storage and use of any chemical or gas filled in cylinder, the unit must have license from appropriate authority for the use and storage of the cylinders. In view of Hazardous material being used by the unit, the unit is also governed by the provisions contained in the Manufacture, Storage and Import of Hazardous Chemical Rules, 1989.

FOR COMPLIANCE IN VIEW OF SAFETY REPORT

14. In the safety report for the safety release valves, unit is asked to have a tag with the information such as SR V ID. Set pressure, Test date, Due date. So far as the liquid tank farm and PESO area are concerned, the report indicates that the unloading hoses were not tagged with the names of the chemicals and the unit was asked to use the hoses with a label showing the name of a chemical. It also recommended to provide proper drainage at the safety shower in this area. In the laboratory area the PPE metrics was not available for different activities performed in the laboratory and handling of various chemicals. At gas cylinder station area normal tools and spanners were being used falsely and installation job and ordinary lighting fixture and switchboard was installed inside the gas cylinder station area. For these, it has been pointed out to prepare proper PPE metrics for handling various chemicals and different activities performed on various machine and instruments in the laboratory, only non-sparking tools and spanners to be used for gas cylinders installation job and flameproof lighting fixture and switchboard be installed the gas cylinder station area.

15. In the canteen area as the LPG cylinder was laid on the ground floor in horizontal position instead of vertical position, the unit was asked to give training to the canteen staff for safe handling of LPG cylinder. In the plan area colour code of pipelines was absent. In the SO_2 storage, there were empty and filled Tonners. In all there are 118 observations and recommendations. it seems that there is lack of proper supervision for maintaining the unit in strict compliance.

16. About tanks storage vessel area, it is reported that flameproof fittings are provided. It is also stated that the storage vessels are bunded/dyked and the capacity of the same is 110%. The vessels have been isolated through valves and fitted with remotely controlled isolation valves. The vessels are provided with emergency went, relief valve, busting disc, level indicator pressure gauge and overflow line. It is also stated that the vessels are provided with alarms for high-level, high temperature and high pressure. There are standby empty tanks provided for emptying in emergency. So far as the on-site gas cylinder storage area is concerned for the storage of Hydrogen and $SO_{2'}$ *it is reported that weathered licences were available for storing these cylinders.*

17. So far as the tank farm is concerned, a drawing is placed in the report along with the distance between the different tanks. The same is annexed herewith and Mark **Annexure 5**, The row of 7 tanks in front and 7 tanks behind that, in all 14. Between the tanks of Di Methyl Sulphate and Nitric Acid there was only one tank. *If the Nitric acid would have been stored away the eventuality could have been avoided. It was known that the Nitric acid and DMS are incompatible and therefore, the authorities i.e. DISH, granting permission for tank farm ought to have realised and should not to have allowed storage at the same place of incompatible Acids.*

18. *From the nature of the safety audit report i.e. discrepancy in dates, absence of seal of the company, report submitted within a one day, multiple/duplicate documents, absence of continuity of pagination warrants a caution.*

SECTION 4

MAJOR ACCIDENT REPORT AND OTHER REPORTS

19. So far as the incident is concerned, the Deputy Director DISH made an order under section 40 (2) of the Factory Act, 1946 on 3rd June, 2020 indicating about his visit to the site with other officers and pointing out that 6 dead bodies were found in the unit itself in about 52 employees suffered due to injury. The injured were shifted to different hospitals as indicated in the report. The report is in detail and the occupier/factory manager has been prohibited to use any plant, place of the factory premises for manufacturing process until completion of the corrective actions. The report is annexed here with Mark **Annexure 6**. As a matter of fact, there is no question of taking corrective action and strengthening the machinery / plant as such an order is inconsonance with subsequent order made on 10th June and the orders made by other authorities including GPCB. There is a Major Accident Report about the accident having taken place on 3rd June,2020 at about 12:10 hours. The report indicates that prima facie on account of mishandling of chemicals in storage tank farm the incident took place. Major Accident Report dated 9th June, 2020 submitted by the unit as per schedule VI under Rule5 (1) of MSIHC Rules is annexed with this report and is marked as **Annexure 7**. However, it was not submitted within prescribed time of 48 hrs. It appears that after receipt of this report the Deputy Director, Industrial Safety and Health made an order on 10th June, 2020 directing the occupier/factory manager under section 9 (F) of the Factories Act to keep the situation in the factory as existing. The said order is annexed herewith Mark **Annexure 8**. The Major Accident Report issued by the GPCB dated 3rd June and the order of

closure of the unit dated 4th June, 2020 made by the GPCB are annexed here with. The GPCB also filed a complaint in the court of competent jurisdiction for the offences, punishable under section 7, 15, 16 and 19 of the Environment Protection Act 1986. The offences being non-cognizable, the complaint was required to be filed before the court of competent jurisdiction. The copy of the Major Accident Report, closure order and the complaint filed by the officer of the GPCB are annexed here with Mark **Annexure 9**.

20. After the incident, Regional office staff led by Shri F. M. Modi (GPCB) reached the place within a period of one hour, 1) Sub Divisional Magistrate, 2) Deputy Superintendent of Police, Inspector of Police and his team, 3) Officers of DISH, 4) Officials of GIDC, 5) Officials of Dahej Industries Association, 6) Officials of Vilayat Industries Association, 7) Officials of SEZ and 8) Mamlatdar, Vagra were present at the site.

21. So far as the environmental issue is concerned, it is stated that they Heavy Volatile Organic Compounds (VOC) emission in prevailing wind direction (SE to NW) towards M/S LNG Petronet Ltd, Hindalco industries and Adani Petronet Port Ltd was noticed. There was generation of contaminated water during firefighting operation. The Gujarat Pollution Control Board, (hereinafter referred as "the GPCB") monitored Ambient Air Quality by Respirable Dust Sampler (RDS) and also VOC by Handy VOC meter. It also collected sample of contaminated water. The reports in this behalf are annexed herewith collectively and marked as **Annexure 10**. On information about the air quality and chances of disaster on account of storage of hydrogen, SO_2 cylinders and solvent storage nearby was conveyed to the District Administration, the process of evacuation was initiated. District authorities evacuated around 4800 people from nearby two villages (village Luvara and Lakhigam) for precautionary measures. Later on, Mamlatdar, Vagra addressed to the Collector along with the list of the persons intimating that from village luvara 1648 and from village Lakhigam 1593 persons, totalling to 3241 persons were shifted for their

safety on account of apprehended danger. The said list is annexed herewith collectively marked **Annexure 11.**

22. (1) The Report indicates the chemicals involved in the incident were such as Ortho Dichloro Benzene (ODCB), Dichloro Nitro benzene (DCNB), Dimethyl Sulphate (DMS), 2,5 Dichloro Aniline (DCA), Nitric Acid, Caustic Potash. (2) There were hydrogen cylinders mounted on the trailers near incident site. There was burning of tyres of the trailers however, there was no impact on the hydrogen cylinders on account of timely action and swiftly control of a fire, (3) Nearby storage: methanol, Xylene and DiCaMba were stored however, the same were not affected on account of fire. According to the report the fire was completely extinguished, smoke emission almost stopped and the situation was under control at about 16:15 hours.

DELAYED F.I.R. AND REPORT TO THE COLLECTOR

23. In charge PI Vipulbhai Laxmanbhai Gagia lodged First Information Report on 11th June, 2020. The cognizable offence was committed and the police reached the place soon after the occurrence however, police did not think it proper to record the information of an offence having been committed. Even the officers namely Shri N D Waghela, working as Deputy Director, Industrial Safety and Health, (DISH) Bharuch and Shri S P Pathak, Assistant Director, Industrial Safety and Health, (DISH) recorded the statements of Shri Mahesh Jivanbhai Gulchar, working as an operator in the unit and Shri Atal Bihari Rajendra Mandal on 6th June, 2020. From the statements it appears that Shri Atal Bihari was concerned with the connection of tankers hosepipes to the tanks in the tank farm. The report is submitted to the District Collector, Bharuch on 10th June, 2020 which is referred in Section 7 in details. The investigating officer was also supplied with the copy of this report and it appears that after the receipt of this Report, the police recorded FIR. As a matter-of-fact as the cognizable offence was

committed, the police ought to have recorded the Information as they were present at the scene of occurrence and ought to have commenced the investigation. Why delay is caused is difficult to understand?

SECTION 5

THE PROCEDURE FOR UNLOADING THE TANKER

24. There is sufficient material on record to conclude that on 2nd June, 2020 the two tankers, one containing Nitric Acid and the other Di Methyl Sulphate (hereinafter referred as 'the DMS') entered the premises for delivery of the said chemicals.

> (As per the procedure followed, the arrival of material is to be first recorded in the inward register of Yashashvi Rasayan Pvt Ltd, (hereinafter referred as "the unit"). The tax invoice issued by Industrial Solvent & Chemicals Pvt Ltd, the supplier of **DMS** (24.9 MT/24980 Kgs/19.03 KL) dated 01-06-20 with the stamp of Dahej SEZ Ltd, Part II indicates the tanker having checked and passed through check post at 18:00 PM on 01-06-20. There is an entry no 504 in the inward register maintained by the unit indicating that the tanker No GJ 16 AV 1462 entered the Unit on 02-06-20 at about 10:45 AM. The entry is recorded in the register mentioning the Inward No., Date, SEZ inward No., & Date, Description of Material, Quantity/Weight, Bill No./Challan No. & Date, Name & Address of Supplier, Vehicle No, Delivery by, In Time, Out Time, Sign of Security Staff/Officer and remarks. The next entry is for the tax invoice issued by Sunshine Products, the supplier of **Nitric Acid** (18.880 MT/14.06 KL) dated 01-06-20 with the stamp of Dahej SEZ Ltd, Part II indicates that the tanker was checked and passed through check post at 10:07 AM on 01-06-20. There is an entry no 505 in the inward register maintained by the unit indicating that the tanker No GJ 06 ZZ 5876 entered the Unit on 02-06-20 at about 11:15 AM. There is next entry recorded on 2nd June, 2020 for the tanker containing 'Con. Nitric Acid (CNA 98%)' The xerox copy of the relevant page of register for the entry of tankers and details of invoices etc, are annexed here with Mark **Annexure 12.**

In the register no date is mentioned for SEZ invoice. The column 'Deliver By' is also not filled in. When the tanker leaves the unit, in the column of

Out Time, time is not recorded. This assumes importance as important document known as "TANKER UNLOADING CHECKLIST FOR RAW MATERIAL" (hereinafter referred as 'the Checklist') is not submitted by the unit.

25. As per the Government Guidelines, Industries were permitted to operate with 50% work force during COVID-19 lock down generally across the country. (Notice/Notification Permitting with 50% of the staff is at **Annexure 13**) Lots of Migrant Labourers have gone back to their Native State during the lock down. The question is whether the unit was being operating with local unskilled labourers who might not be aware about the functioning of plants dealing with hazards chemicals? Where persons are required to deal with hazardous chemicals, it is absolutely necessary that person should have at least ITI certificate for his efficiency in dealing with the subject. If he's a graduate with chemistry the question does the arise. In either situation the person would be competent to deal with hazardous chemicals. It does not transpire from the statements of the operators that they were qualified to operate as none said that he is either ITI AOCP (Attendant Operator Chemical Plant) or Diploma holder or Graduate with Chemistry.

26. After completing the formalities of checking the invoice and other relevant records, the chemical received is tested and is recorded in a register known as "Titration Record Register". As per the register Nitric Acid sample was tested at 11:50 AM on 2nd June, 2020, however, DMS is not recorded in the titration register as and same is tested by gas chromatography. The report of gas chromatography indicates that the material was received for testing on 2nd June, 2020 at 12.05.41 hours. (Xerox copies of test record are at **Annexure 14** collectively)

27. The entry and test records are made available. However, all other relevant record kept in the office, according to the principal witness of the unit,

permission is sought for removal of debris from the competent authority in view of the acidic feed. Sulphur dioxide cylinders are lying under the debris and therefore, without the aid of the authority and the experts already consulted in the subject matter, it is difficult to remove the debris. The chemicals are lying in the reactor. Only after removal of all these dangerous materials, it will be possible to enter the office premises to give the feedback on the CCTV footage and other documentary evidence.

28. The Chemicals were required to be unloaded from the tankers. Apart from the entry in the register and test report, the process of steps followed is documented in the checklist with tanker number, material, reporting time and date. *In all more than 40 checklist items are there which are required to be recorded/checked by the person concerned. Security supervisor, the person checking the documents, chemist, person in charge of the store, plant operator, shift engineer, head of the Department, fire officer/executive and the plant operator are required to sign. The plant operator and shift in charge are again required to sign in token of completing procedure after unloading the tanker. It is thereafter to be filled by the commercial department and again by the security department at the time when the tanker is leaving the place. Thus, it is not on arrival of the tanker and with the test the same is required to be unloaded.*

29. Earlier on 28th May, 2020 the tanker of Nitric Acid was unloaded and the Xerox copy of the checklist is made available. (the xerox copy is produced at **Annexure 15**) The security department has not merely tick marked the entries but after verifying the details, the same are recorded in the form. Security department has written the name of the driver, his driving licence number, name of the transporter. he checked whether seal wires/sealed bottles of the tankers were intact or not and whether the driver was authorised to transport hazardous material or not. Whether Mobile, Tobacco, Cigar, Match Box, Stove, Kerosene have been collected at the gate or not after verifying. The vehicle moving with hazardous material, the spark arrester, the condition of the tanker such as body/tyre,

availability of extinguisher in the tanker, the tanker is leaky or in damaged condition, TREM CARD is available with the documents and the weight were checked and noted. After completion of this checklist, the time of inspection and when the truck left the gate is mentioned. The quality assurance department checked everything as indicated in the checklist and to put the time of arrival and time of approval of the sample. The commercial department thereafter giving all the necessary details with the time of arrival of the tanker and the time when it was sent for unloading is mentioned. Thereafter the authorised operator checked at least 10 items and filled in certain data. He again verified the tanker number and that matches with the slip, Operator also checked and mentioned whether sufficient space was available in the tank to accommodate the quantity in the tanker, other utilities such as water, steam, nitrogen and instrument air etc, were available or not. He verified that ignition keys have been deposited by the driver to the shift in charge. He mentioned tank number to which tanker unloaded the chemical with the name of the tank, checked its hose connection and on finding OK referred the pump number for unloading. He checked initial level of tank and thereafter the same was signed by the Plant Operator, Shift in Charge and the Head of the Department. Again, the fireman personally checked items mentioned therein and thereafter signed the same. The plant operator again signed as required on completion of unloading after checking 10 items with the time at which the tanker was unloaded completely. This is also acknowledged by the shift in charge with his signature. The commercial department again weighed the tanker and noted the difference between the invoice, weighment of the truck before unloading and after unloading along with the time of arrival of the tanker after unloading and departure after weighment towards gate. Again, the security officer signed the same checklist after verifying the weighment and noted the time and date. Thus, a strict procedure is required to be followed while unloading hazardous chemical. *The checklist which has been given for Nitric Acid unloaded on 28th May, 2020 duly filled in and signed by all the persons reveal that at 12:10 PM the procedure of unloading commenced and was completed at 8:45 AM on the next date i.e. 29th May, 2020.* Twelve persons are required to sign and at one place

and where most important details are to be filled in and checked, three persons namely the Plant Operator, Shift in Charge, and the Head of the Department are required to sign and after completing unloading on checking 10 items, the Plant Operator and Shift in Charge are required to sign.

PICTOGRAM AND NAME OF THE CHEMICAL DISPLAYED ON A TANKER

30. At this juncture it would be also relevant to refer the provisions contained in Rule 134 the Central Motor Vehicles Rules, 1989 which mandates the tanker/carrier to display in a very specific manner the name of the hazardous chemical, pictogram and other relevant aspects.

> 134. Emergency information panel.—(1) Every goods carriage used for transporting any dangerous or hazardous goods shall be legibly and conspicuously marked with an emergency information panel in each of the three places indicated in the Table below so that the *emergency information panel faces to each side of the carriage and to its rear* and such panel shall contain the following information, namely:—
>
> (ii) *the correct technical name of the dangerous or hazardous* goods in letters not less than 50 millimetres high; (I) the United Nations class number for the dangerous or hazardous goods as given in Column 1, Table 1 appended with rule 137, in numerals not less than 100 millimetres high;
>
> (iii) the class label of the dangerous or hazardous goods of the size of not less than 250 millimetres square;
>
> (iv) xxxxxxxx
>
> (2) *The information contained in sub-rule (1) shall also be displayed on the vehicle by means of a sticker relating to the particular dangerous or hazardous goods carried* in that particular trip.]
>
> (3) *Every class label and emergency information panel shall be marked on the goods carriage and shall be kept free and clean from obstructions at all times.*

31. In case a tanker is carrying NITRIC ACID, which is corrosive and oxidizing, following information is required to be painted both the side and back of the tanker, according to the size prescribed under the Motor Vehicle Rules,1989 referred above.

On the tank where Nitric Acid is stored, with white ink **NITRIC ACID** -**TAG NO, CAPICITY** and number of the **TANK** is required to be mentioned. Just an example, Nitric Acid was unloaded on 28-05-2020 in the unit. Tank No, mentioned is ST-5103A and the Tank name is mentioned $HN0_3$.

32. DMS is flammable, toxic and contact hazard. the pictogram with other details painted on three sides of the tanker, on both the side and back of the tanker was as under.

Thus, reading the pictogram on the tanker and the name of the chemical on tank it was easy to identify even for a person not conversant with the work. The names of chemicals written on tankers as well as tank with numbers there was no question of not identifying the correct tank to be connected. *Witness admitted that on both the tanks names of chemicals were written and were legible.*

What is indicated above is the procedure required to be followed by the unit staff while unloading. How the hazardous chemicals were unloaded on 2nd June,2020 is to be seen?

SECTION 6

EVIDENCE COLLECTED BY DISH ON REPORTING OF VEHICLES CONTAINING DMS AND NITRIC ACID AND UNLOADING

33. DISH recorded the statements of the persons working in the unit and submitted the report to the District Collector dated 10.06.2020. The statements of the persons when translated in English read as under: - (Not exactly translated and only relevant portion reproduced)

STATEMENTS OF 3 WITNESSES

1. Shri Atal Bihari (translated copy of his statement in English supplied by DISH is annexed herewith Mark **Annexure 16**) joined his duties before about four months as SO_2 operator near the Tank Farm Area and on 02-06-2020 at about 07.00 A.M. joined the duties. On 02.06.2020 at about 12.00 noon, Tank Farm Operator Shri Mahehbhai Jivanbhai Galchar (hereinafter referred as 'Shri Galchar') while leaving for H R office asked him to connect the two tankers with two tanks i.e. one of Nitric Acid and the other of DMS and asked to unload DMS and Nitric Acid. At about 12:30 SO_2 operator, Shri Atal Bihari joined both the tankers through hosepipes with the storage tanks and thereafter he switched on the pumps to unload the chemicals. At the time of transfer in the DMS storage tank, there was 25 tons of the DMS in the tanker of the DMS and, 18 tons of Nitric Acid in the Nitric Acid tanker. The storage capacity of DMS storage tank was 60 kilo litters (KL) and capacity of storage tank of Nitric Acid was 20 kilo litters (KL). Shri Atal Bihari commenced the unloading from both the tankers by about 12:30 in view of the instructions given by Shri Galchar orally to connect the tankers. Shri Atal Bihari further stated that at the time of unloading DMS tanker, it contained 25 tons DMS and the tanker of the Nitric Acid contained 18 tons of Nitric Acid. Unloading of DMS and Nitric Acid continued for about two hours, thereafter Shri Galchar, returned from the H R office on completion of his work to tank farm area. At that time, after checking the papers, Shri Galchar realized that by mistake the hosepipe of a tanker containing DMS has been connected to the tank of Nitric Acid and the hosepipe of Nitric Acid tanker is connected with the tank of DMS. Before Shri Galchar realized this mistake, DMS was already

unloaded in the Nitric Acid tank. Looking at the tanker in view of name and other details mentioned and looking at the tank one would realise that there is a mistake without looking at the papers. From where he brought the papers is not conveyed. Immediately the pumps were switched off and the hosepipes were disconnected. However, some acid remained in the tanker of Nitric Acid. He further stated that the material from DMS tanker unloaded in the tank of Nitric Acid tank, was transferred to the other tank used for storage of Nitric Acid. (The story of unloading is not stated by Shri Galchar) Nitric Acid unloaded in the tank of DMS remained as it was. After the chemicals were unloaded (*as if instead of tea, coffee was mixed and without taking any serious note*), Shri Atal Bihari left for his home as his shift was over. On the next day at 07:00 A.M. he reached the Unit to attend the duties. At that time in the storage tank area senior officials of the Company were trying to unload the material from the tank in a drum by use of hosepipe. Meanwhile at about 12 Noon there was an explosion. Thereafter, he moved from the place in a vehicle of a Company and went to his home. Looking to the nature of explosion silently moving away is doubtful *(There is no statement recorded by the officials by the DISH to find out whether the officials of the unit commenced the work of unloading the material from the tank at about 7 or 7:30 AM on 3rd June, 2020 as suggested by this witness. The statements of the officers are not recorded or if recorded, the same are not placed with other record.)*

2. There is a statement of Shri Galchar recorded by the officers of the DISH on 06.06.2020. (translated copy of his statement in English supplied by DISH is annexed herewith Mark **Annexure 17**) According to the statement he was working since about nine (9) months as Liquid Storage Tank Farm Area Operator. On 02.06.2020, at about 07.00 a.m. he joined duties. At about 12.00 noon for his work he had been to HR Office. After completing his work within about two and half hour he returned to liquid storage farm area where he saw the work of unloading of chemicals namely, the Nitric Acid and the DMS from tankers to two tanks. *In his absence, as per instructions of Shift in charge who sits in the D.C.S. Room, Shri Atal Bihari connected the tankers. (Shri Atal Bihari states that as per instructions of Shri Gulchar he unloaded the tankers but Shri Gulchar does not say about such instructions however, he says that as the shift in charge instructed Shri Atal Bihari unloaded the tankers)* He further stated that all of us are required to work as per the Instructions of shift in charge. (It is required to be noted that there is no statement recorded by DISH of Shift In charge.) After about one and half hour or two hours, on his return when he looked at the connections, he

realized that the Nitric Acid tanker is connected with the DMS tank and the DMS tanker is connected with the Nitric Acid tank. Therefore, he immediately switched off the pumps for transfer. The production in charge Shri Bharat Aggrawal was conveyed immediately in person in DCS office. He and other senior officials came to the tank farm area and they were thinking to transfer the material. He was not aware that after the transfer of chemical wrongly any chemical or neutralizing agent was added to see that there is no dangerous chemical reaction on account of mixing. After the shift Changed. He left for home and he had no duty on the next day. However, at his residence he came to know about the explosion having taken place in the unit.

3. There is nothing to indicate that the officers of DISH questioned any officials of the unit who were well qualified and had experience in the Chemical Industry. The officers of the DISH have not tried to verify the factual position by proper interrogation or by putting proper and essential questions to elicit the correct facts to the persons who appeared to have played any role or who did not discharge their duties which were imposed upon him or them. He ought to have questioned all persons required to sign the checklist, the drivers of the tanker and the other tankers which were there for unloading other material.

4. After 15 days from the incident, 8 days after recording the statements of the aforesaid two persons and after submitting the report to the Collector on 10th June, 2020 the officers of the DISH have recorded the statement of Shri G N Patel who was working as DCS operator. (translated copy of his statement in English supplied by DISH is annexed herewith Mark **Annexure 18**. He stated that while working as an operator in the control room, noticed at about noon that the level of Nitric Acid in the day tank of Nitrosyl Sulphuric Acid was low in the panel. Thereupon he called Tank Farm Operator Shri Gulchar on telephone and conveyed him that tanker number GJ 6-ZZ-5876 of Nitric Acid was checked for quality control be unloaded in the Nitric Acid storage tank No. 08 and 2nd tanker number GJ 16-AV-1462 of DMS checked by quality control department be unloaded in DMS storage tank No. 05. *(Shri Gulchar does not say but on the contrary say that Shri Atal Bihari was informed by the shift in charge to unload)* Shri Gulchar had gone from tank farm to HR office for his personal work at about 12 noon after giving instructions to Shri Atal Bihari for unloading Nitric Acid tanker in Nitric acid storage tank and DMS in DMS storage tank. On 2nd June, 2020 at about 12:30 PM said Shri Atal Bihari connected both the tankers with storage tanks by using hosepipes and immediately switched on the pumps. However, he connected Nitric Acid tanker to

the DMS storage tank No. 05 with hosepipe and DMS tanker to Nitric Acid storage tank No. 08. Shri Gulchar after completion of his personal work from HR office returned and he came to know about the mistakes. When he saw the connections, he realised the mistakes. During this time 18.8 MT of Nitric Acid was unloaded in the DMS storage tank No. 5 and about 22MT of DMS was unloaded in the Nitric Acid storage tank No. 8. He further stated that about 7.5 MT was already existing in DMS storage tank as per DCS records. With the unloading of 22MT of DMS the total volume became 22.9 ton as some material was there in tank No. 08. He has further stated that he was informed on telephone by Mr Gulchar about the mistake. This witness immediately informed all senior officers who were present. He along with senior officers Shri Thumar, Shri Miteshbhai Patel, Shri Bharatbhai Agrawal, Shri Yunus Khaliwal-DGM Safety etc, assembled at 3 PM at the tank farm and discussed their technical opinions and decided to transfer by pump about 26.3 MT of mixtures of DMS and Nitric Acid from tank No. 05 to Nitric Acid storage tank No. 09 in which dead volume 0.9 MT of Nitric acid was already existing.*(the capacity of Nitric Acid tank is 20 KL and therefore, no one would take the risk of transferring the entire quantity of 26.3 MT in a tank where there was already storage of 0.9 MT of Nitric Acid.)* In other tank mixture of 22.9 MT was not disturbed. On completion of shift time, he went home. The next day in the afternoon he got information from a friend on telephone about the explosion.

Using this data AFTER transferring from Tank 5 to Tank 9								
Tank	**Designated**	**Designed**	**Density**	**Content**	**Material**	**Remaining**	**Fill**	
Number	**Tank**	**Vol (L)**	**kg/L**	**MT**	**Vol (L)**	**Space (L)**	**level (%)**	
4	DMS	60000	1.33	*0*	0	60000	0.0	
5	DMS	60000	1.45	*0*	0	60000	0.0	
8	HNO_3	**20000**	1.50	*30.9*	**20600**	**-600**	**103.0**	**Overflow**
9	HNO_3	**20000**	1.45	31.5	**21724**	**-1724**	**108.6**	**Overflow**

In view of the above table prepared by expert member it is not possible

to believe the story of the unit.

STORY BEFORE THE POLICE BY DISH

34. The report was submitted by the officials of DISH to the Collector on 10th June,2020 and the copy of the same was handed over to the investigating officer who has recorded the contents of the letter. On reading the contents of the letter which were reproduced by the police officer in the FIR, it was difficult to accept the case as suggested in the report considering the quantity of chemicals which were stored in the tanks and the quantity of chemicals unloaded in the tanks. The relevant part of the report would convey the meaning in English as under: -" …. *SO_2 operator Shri Atal Bihar, after connecting the hosepipes to unload the chemicals switched on the two separate pumps for unloading and at that time in the storage tank of DMS, 25-ton DMS and in the Nitric Acid storage tank, 18 tons Nitric acid were stored."* (copy of the FIR in vernacular is annexed herewith Mark **Annexure 19**)

EXPLAINATION

35. The officer gave an explanation that in the original letter addressed to the Collector on 10.06.2020, the mistake was committed in conveying the information and subsequently, there were corrections in the letter. Originally in the letter, it was mentioned *"in the DMS storage tank, 25 tones DMS and in Nitric Acid storage tank, 18 tones Nitric Acid remain stored"*. At two places in the same sentence the word ~~**storage**~~ is scratched but which can be read. In the word Tank, letter R (in gujarati ર) is added so as to read Tanker at both the places. The words 'in storage tank' is changed to 'tanker' by scratching the word ~~**storage**~~ and adding letter R (in gujarati ર) to the ward 'tank' (in gujarati ટેન્ક). In the word tank 'ટેન્ક' letter "ર", is added so to read tanker ટેન્કર. However, the words "storage was

lying" have remained as they were which would convey that "In the storage tank acid was stored or the in the acid tank storage remained". The copy of the report submitted to the Collector on 10th June,2020 is annexed herewith Mark **Annexure 20**. This makes it clear that large quantity of acid was in both the tanks. If the chemicals indicated in the letter was stored in the respective tanks than it could not have been possible to unload the quantity suggested. It was made clear that the officer realised when the officer was called for an explanation and the changes were made thereafter in the letter. *If the persons who are required to look after the safety and security of the people at large are acting negligently in this manner and are making corrections in the document it becomes very difficult to rely on their function or about their words.*

EVALUATION OF EVIDENCE

36. Whether the version given by the Tank Farm Area Operator Shri Galchar, SO_2 Operator Shri Atal Bihari, and G. N. Patel DCS operator can be accepted?

A. It is the case of Shri Atal Bihari, who connected the tankers with the tanks, that he was asked by Tank Farm Operator Shri Galchar to connect the tanks. However, Shri Galchar in his statement did not say at all about the instructions given by him to Shri Atal Bihari to connect the tankers with the tanks to unload the chemicals. How Shri Galchar could have stated that during his absence, shift in charge who sits in the D.C.S. Room instructed Shri Atal Bihari to connect the tankers? The DISH has not recorded the statement of the shift in charge, who sits in D.C.S. room. Therefore, it becomes clear that the version is not acceptable about instruction being given to connect the tankers with the tanks.

B. DMS tanker, contained 25 tons DMS and the tanker of the Nitric Acid contained 18 tons of Nitric Acid. These people want others to believe that 25-ton DMS was completely unloaded but 18 ton of Nitric Acid could not be unloaded completely by that time.

C. Shri Galchar did not say about his leave/absent before sometime and that Shri Atal Bihari was given a charge of the Tank Farm Area. To find out the

truth on this aspect no exercise is undertaken by the officers of the DISH. When person enters the premises, he has to record the time of his arrival with date and if this register would have been checked by the officials of the DISH, they would have come to know about the truth.

D. Shri Atal Bihari came out with the weighment of tankers, at the time of unloading DMS tanker contained 25 tons DMS and the tanker of the Nitric Acid contained 18 tons of Nitric Acid. *This can be said only if the documents were seen by the person. If he would have seen the papers only then he would have known the nature of the material contained in each tanker with the weight of the chemical. Papers were to be taken from both the drivers of the tankers for verification and other details were required to be noted. On the tanks of DMS and Nitric Acid, the names of the Chemicals were written very clearly and before about five days he claims that he also worked as a Tank Farm Operator. In this situation it is difficult to accept that he would not have noticed the writings along with the pictograms on the tankers and the writing on the tanks. Unloading commenced simultaneously as claimed and the DISH has accepted that 25 tons of DMS was completely unloaded and the Nitric Acid weighing 18 tons was not completely unloaded. (in the report this aspect is referred).*

E. *The version given by these 2 operators with regard to joining the unit in the morning and leaving is also required to be considered. Both came to the unit at 7 AM. Shri Atal Bihari stated that soon after the disconnection of the tankers with the tanks, material loaded in the tank of DMS from the tanker of Nitric Acid, the process of unloading the chemical from the tank DMS commenced for transfer of about 18 ton Nitric Acid and 7.5 ton about DMS which was in the tank before unloading.(25 ton DMS+7.5 ton Nitric Acid= 32.5 MT) and when that work was in process left the unit as shift time was over. This version of unloading the chemical as stated is not supported by Tank Farm Area Operator Shri Galchar. Not only that but looking to the quantity suggested it could not have been transferred. Both would have left after the shift time being over however, Shri Galchar went to the office, met the senior officials and came to the spot with them. On all important aspects both are not corroborating each other and therefore, there version is highly suspicious and becomes an acceptable.*

F. As a statement of Shri Patel has not been recorded soon after the occurrence, it raises doubts about his version and it appears to cover the gaps in the evidence of other witnesses, the statement of this witness is recorded after much delay. He was not present in the tank farm area and therefore, what happened in the tank farm was not known to him. He was not a witness to the incident of connecting the tankers or removal of the connections. As he was not present in the tank farm area, neither he saw

both the operators nor heard them from the tank farm area. He is trying to assist the wrong doers by saying which has not been said by other witnesses. He was required to be questioned properly.

G. Shri Gulcher did not say that he received a message on telephone to unload the Nitric Acid and DMS from particular tanker numbers. In fact, Shri Gulcher has not at all referred the name of this witness anywhere. While sitting in the DCS office, how he could have acquired the knowledge personally that Shri Gulchar had gone for his personal work to HR office at 12 noon, after giving instructions to Shri Atal Bihari for unloading the chemicals in their respective tanks, and returned there from after about two hours. This witness also said that Shri Gulchar, when he saw the connections, he realised mistakes. He was not present at all in the tank farm area and therefore, his version about conveying the instructions by Shri Gulchar to Atal Bihari, connecting the tankers to the tanks by hosepipe and switching on the line to run the pumps for unloading the chemicals, cannot be accepted. Neither Shri Gulcher nor Shri Atal Bihari referred even the name of this witness. Even Shri Gulcher did not say in statement that he conveyed the information about the mistakes on the telephone to this witness. But, on the contrary he said that he went to the office and conveyed to senior officers. This makes it clear that the version of this witness (G. N. Patel) with regard to what happened in the tank farm area on 2nd June, 2020 cannot be accepted. As a matter-of-fact the procedure while unloading the chemicals as indicated in the Checklists is not referred by any witness. None has referred any procedure followed for unloading the chemicals. The witnesses did not follow the procedure while unloading are responsible for the mishap. Procedure must be followed for the safety of the people at large, property and protection of environment.

H. The security officer, the person checking the documents, chemist, person in charge of the store, shift engineer, head of the Department, fire officer/executive, the plant officer etc have not corroborated the procedure followed. That raises a serious doubt about the manner of unloading the chemicals.

37. The version of the witnesses and the acceptance of the same by the DISH is required to be examined very minutely. Before the officers 'Tanker Unloading Checklist for Raw Material' was available for the tankers that unloaded DMS on 31-05-20 and Nitric Acid on 28-05-20. (Checklist attached herewith Mark collectively **Annexure 21**) Reading the details, many others were required to be questioned. Why 'initial level of tank

____%' as well as 'Final level of tank' are kept blank. How much time was taken for unloading 21.930 Mt Nitric Acid on 28-05-20 and how much time was taken for unloading 18.880 MT on 02-06-20 is not examined. Why? To completely unload the tanker of 21.9 MT the process of unloading commenced at 16:40 hours and the tanker was completely unloaded at 6 AM on the next day. On 2nd June, 2020 within two hours it was unloaded.

38. There were doubts about the version recorded in the statements, original record (the report submitted by the DISH to the District Collector and other record) was called. There is no statement of any person stating about the procedure followed as per the tanker unloading checklist for raw material.

39. It appears that DISH has not questioned the officer of the unit with regard to the accident and on other aspects as well. Turning to important aspect about the checklist it is answered by the unit that "The Tanker Unloading Check-list related to the tankers received on 2nd and 3rd June have not been found due to accident, but Tanker Unloading check list for previously unloaded Nitric Acid and DMS have been attached for your understanding of the procedure followed by us as Annex 12C & Annex 12D." (these are referred as Annexure 15 & 21 in this Report) (the copy of the statement provided by DISH is annexed herewith Mark **Annexure 22**) ***However, the checklist dated 2nd June, drawn at 2:35 PM of a tanker bearing number GJ 15 X 8445, containing SO_2 is made available.*** (the copy of the checklist of SO_2 is annexed herewith Mark **Annexure 23**) If the DISH would have properly inquired, the truth would have come out. After following the procedure and after checking the hose connection at about 11: 10 hours the checklist at that stage was signed by the Plant Operator Shri Atal Bihari and the Shift in Charge however, the same is not signed by Head of the Department. The tanker was unloaded and the driver reported to the commercial department at 14: 20 hours. This checklist is also of 2nd June, 2020. On behalf of the unit it was specifically stated that the checklist for tankers unloaded on 2nd and 3rd June have not been found due to

accident. The question is how this document is made available? When this checklist was produced before the DISH, the officer did not further question about the non-availability of other checklists. The checklists of different dates are given where outside the office? If the driver of this truck was examined, he would have thrown light about the presence of other tankers and many aspects could have been come to light. No tanker driver is examined, Why?

40. On 3rd June, 2020 at about 0920 hours in the inward register there is an entry at serial No. 511, bearing SEZ number 6523 indicating that the tanker number GJ 06 BT 2777 containing 34330 KG of the DMS supplied by Kutch Chemical Industries Ltd, arrived at the unit. However, there is nothing to indicate further about the unloading of this tanker. The Copy of this entry is Annexed herewith Mark **Annexure 24**. What was done with 2,5 DCNB 25,400 KGs received vide inward no 503 on 02-06-2020? The unit has a licence to manufacture 2,5 DCA and the unit is expected to sell the material. However, inward register entry no 502 shows that on 2nd June,2020 a tanker brought 23,550 KG of 2,5 DCA. The Copy of this entry is Annexed herewith Mark **Annexure 25**. It appears that DISH has not questioned further about the unloading of this tanker, Why?

SAFETY AUDIT REPORT ON STORAGE

41. The Safety Auditor at page 49 mentioned that the unloading hose pipes are not tagged with the names of chemicals and recommended that the hoses should be labelled showing the name of the Chemical. It is also pointed out that all the hazards (physical-noise heat etc and chemical-fire, explosion, toxic release etc,) area are identified and the audit report insisted for ambient monitoring devices with alarms for leakage of hazardous material. Not only that but, the Safety Audit Team in the report at Annexure No VII Tanker Unloading S.O.P. It states (Taken **verbatim**) “6.6 A tanker unloading work permit (Tanker unloading checklist for raw

material) is required for all hazardous chemical tanker shall be unloading safely in the tank farm. Tanker unloading activities shall be present by the Area operator. Tanker unloading before should be permitted checklist as per tanker unloading checklist. The tanker unloading some examples includes". However, there is neither work permit nor the check list duly signed by different persons at different stages. As these documents are not coming forward it can be said that there is a serious breach of safety norms and the authorities under the Factories Act, 1948 and the Gujarat Factories Rules, 1963 granting permission for the erection of the tank farm have not bothered to interrogate the persons properly so as to bring out the truth. (the page of the Audit Report is annexed herewith mark **Annexure 26**)

SECTION 7

PRECAUTIONS WHILE STORING HAZARDOUS CHEMICALS

42. Accident Prevention **'Manual for Industrial Operations'** have issued a note about ***incompatible chemicals*** and the same reads as under: -

"*Incompatible materials should not be stored together where they can be inadvertently mixed or where a spill or leak can cause danger. General guidelines are:*

1 to 5 xxxxx

6. *Incompatible acids must not be stored together. (Examples: perchloric acid is not to be stored with a reducing agent such as sulfuric acid, as upon mixing, this could produce a shock sensitive explosive; nitric acid and acetic acid, a potential explosive mixture, must not be stored together.)*

Chemical	***Store Away From or Out of Contact With***
Nitric Acid *(concentrated)*	*Acetic acid, aniline, chromic acid, hydrocyanic acid, hydrogen sulfide,* ***flammable liquids*** *and flammable gases.*

43. List of incompatible chemicals can be found in the book, **Fire Protection Guide on Hazardous Materials,** by the National Fire Protection Association or in Department of Transportation's shipping directives. Other sources of information are the various "Chemical Safety Data Sheets" by the Manufacturing Chemists Association, Inc. and "Materials Safety Data Sheets" (OSHA Form 20) which can be obtained from our suppliers. It is recommended that "Materials Data Sheets" be obtained on all compounds that are potentially hazardous. These contain information concerning incompatibility, safety, health and first aid. This information may prove useful in informing personnel of the hazards and precautions concerning individual materials."

    All manufacturers of hazardous chemicals must publish DATA SHEET so as to give information to everyone and particularly the users and staff in vernacular should be made aware while mock drill is carried out and so that the persons dealing with the material are made aware and would take all prevention against hazards."

44. **Gaylord** Chemical Company issued a Safety Data Sheet for DMS. According to that a **PICTROGRAM** is required with the signal ward to **DANGER.** It is also necessary to mention hazards statements that are *Highly Flammable Liquid* and Vapour. So far as Flammability and Explosion information is concerned it is pointed out that: -

    > *"Highly flammable liquid and vapor. Will be easily ignited by heat, sparks or flames. Vapors may form explosive mixtures with air. Vapors may travel to source of ignition and flash back. Most vapors are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks). Vapor explosion hazard indoors, outdoors or in sewers. Runoff to sewer may create fire or explosion hazard. Containers may explode when heated. Many liquids are lighter than water."*

    It is specifically mentioned with regard to stability and reactivity that it is incompatible material with oxidisers (the Chemical Engineers or persons having experience dealing with the hazardous chemicals must be aware

that the Nitric Acid is an oxidiser).

45. **ELDORADO** Chemical Company has issued a data sheet for concentrated Nitric Acid 98%. For the 'Hazards Identification', it is pointed out the label elements for indicating PICTOGRAMS and signal word DANGER. So far as the stability and reactivity is concerned, it is indicated that the same may *intensify fire and is an oxidiser.*

46. **American Chemical Society** has published on website literature with regard to incompatible chemicals. It says that "many chemicals are incompatible with each other. According to Laboratory Safety for Chemistry Students (PDF), by Robert H. Hill, David C. Finster :-

> *Incompatible chemicals are combination of substances, usually in concentrated form, that react with each other to produce very exothermic reaction that can be violent and explosive reaction and/or can release toxic substances, usually as gases.*

Care should be taken when handling, storing or disposing of the chemicals in combination. The aforesaid society has given list of incompatible chemicals and their levelled material is indicated hereinunder.

Nitric Acid concentrated incompatible with Acetic Acid, Citole, Alcohol, flammable substances, such organic chemicals.

Note: - *There have been many explosions from inappropriate or inadvertent mixing of Nitric Acid with organic chemicals in west countries."*

47. **Thermo Fisher Scientific** has published a Safety Data Sheet for DMS. The same is classified as Hazards chemical or flammable liquid, Carcinogenicity Category-1B. The label elements, pictograms as well as statement that it is combustible liquid. DMS is incompatible with strong oxidizing Agents.

48. **New Jersey Department of Health** has published hazards substance fact sheet (Right to Know) for DMS. According to the Hazard Summary of the data sheet, it is Carcinogen, mutagen, it may be a tetragon. It may be specifically indicated that 'HANDLE WITH EXTREME CAUTION'. Under the head fire hazards, it is indicated that the *DMS is a combustible liquid.* Under the head, handling and storage, it has been specifically indicated that *prior to working with the DMS, one should be trained on its proper handling and storage.* Various aspects are indicated but relevant is hazards, the *DMS is not compliable with oxidizing agent* (Such as PERCHLORATE, PEROXIDES, PERMANGANATE, CLORETS, NITRITES, BROVAIN and FLORID*). Strong Acids such as, Hydrochloric, Sulphuric and Nitric.*

49. The Sigma Aldrich has published data sheet for DMS wherein it is indicated that the DMS is highly flammable liquid and vapour.

50. **The New Jersey Department of Health** has published hazards fact sheet for the Nitric Acid, *the Nitric Acid is not combustible but is a strong oxidiser that enhances the combustion of other substance.* With regard to handling and storage after pointing out prior to working with Nitric Acid, *one should be trained on its proper handling and storage.* Various aspects have been they indicated, the relevant aspects under the head 'Handling and Storage' is as under: -

> *Nitric Acid may react violently or cause fires with comestible, organics.... Under the head 'Hazard Data' it is pointed out that Nitric Acid is a strong oxidizer that enhances the combustion of other substances. It is also pointed out that* ***Nitric Acid is reactive and a DANGEROUS EXPOLSION HAZARD****.* (All the literature is available on web just on click)

51. When there is more than sufficient material available to find out whether DMS and Nitric Acid are compatible or incompatible and what would be the consequences of the mixture, it is suggested that the qualified officers

with experience in the subject, were satisfied with unloading from one, out of the two tanks of the mixed chemicals. Another tank was not disturbed. Having come to know about the mixing of the hazardous chemicals which were incompatible, they ought to have informed the authorities for the purpose of safety and protection and they also failed to neutralize. It appears that the Nitric Acid by mistake as they say was unloaded in the tank of DMS. The tank for Nitric Acid is required to be made from the material which is corrosion resistant to HNO_3 (with glass line or stainless steel). Therefore, it appears that they decided to unload the chemical i.e. Nitric Acid which was unloaded in the tank of DMS and to transfer in the empty tank of Nitric Acid. According to the witness, the work was over about 3.40 PM on 02.06.2020 and on the next day they decided to take action for DMS unloaded in the tank of Nitric Acid. Surprisingly, the DISH has till today not recorded the statements of any of the responsible officer to know the correct position and if recorded not placed before the Committee. (in a short period can it be unloaded) Whether in a short period once unloading and thereafter transferring in another tank is possible?

HOW SECOND DISASTER AVOIDED

52. Another incident was avoided at the same place and the report for removal and disposal of the hazard's mixture has been drawn on 10.06.2020. The unit informed the District Collector and the Chairman, District Crisis Group, Bharuch on 10.06.2020, that one tank has residual chemical mixture led in ill manner due to the explosion which took place on 03.06.2020. It was indicated that the temperature was increasing, the possibility of another explosion cannot be ruled out unless the residual chemical from the said tank is removed. On receiving such information, District Crisis Group, Bharuch consisting of the SDM, Bharuch, DISH officials, GPCB officials, DIA officials, Safety Experts from BPMC Ankleshwar, OPAL, GFL reached the place immediately.

53. The officials realised that the material is required to be removed to avoid unavoidable incident. They discussed the safe mode to be adopted for removal of residual chemical. They decided to make lime-sand bed on hard flooring in open area. An Air Operated Diaphragm Teflon Pump (AOD Pump) of small capacity was arranged for spreading the residual chemical from the tank. On the Bed of lime and sand the chemical was taken out for stabilization, as per the decision by use of AOD Pump by spreading it on lime bed gradually with water sprinkling by fire hydrant to absolve toxic release. It took about three hours. The temperature measured outside the tank of mixture was 84^{o} Celsius and vapour fumes already found inside this tank. They did not take the sample of this mixture for analysis purpose considering the risk of explosion and toxic effect. Ambient air quality was monitored by the officials of the GPCB, the VOC meter indicated 0 ppm in surrounding area. They instructed the occupier of the unit to lift all the waste material generated during the aforesaid activity safely and dispose of as per the permission of GPCB. However, when the team visited, the waste material generated was not removed on the pretext of danger as some cylinders were lying under the debris. (The reports are annexed herewith collectively and Marked at **Annexure 27)**

54. There is a report from the Expert Member Shri Chinmay Ghoroi, Associate Dean, Chemical Engineering Department, IIT, Gandhinagar, the copy of which is annexed herewith and Mark **Annexure 28**. The report conveys about the accident, explosion/fire and has indicated the steps required to be taken. It also raises certain questions and the Committee feels that these are required to be considered by the authority concerned.

    1. From the reaction scheme from 2.5 DCNB to Dicamba, all the raw materials, intermediates and products are identified in the report.
    2. On the day before the accident (June 02, 2020) one DMS tanker (24.98 MT) and one HNO_3 tanker (18.8 MT) came inside the plant premises. After relevant document check by appropriate authority, unloading operation stared from two tankers simultaneously.

However, due to wrong positioning of tankers and the 18.8 MT of 98% HNO_3 unloaded into the DMS tank storage tank (tank no. 5) which already contained 7.5 MT of DMS and the DMS tanker unloaded into HNO_3 storage tank (tank no. 8) which contained very less amount of HNO_3 (0.9 MT). As HNO_3 unloaded in the tank 5 had 2% water, this water reacted with DMS content in the tank and produces undesirable chemicals such as CH_3NO_3 (highly explosive) CH_3OH (highly flammable) etc. along with increase in the tank temperature. As the tank 5 materials of construction (MS) is not suitable for HNO_3, authority transferred this mixed content (7.5 MT +18.8 MT = 26.3 MT) into another HNO_3 tank (tank number 9 made of MS Glass Line) which had already 0.9 MT of 98% HNO_3. As the mixture was already hot, some of the chemicals started decomposing and pumping operation added extra energy to the content of Tank 9. The tank level was about 94% or more. The pressurized tank (Tank 9) which had higher temperature and pressure exploded. Based on the production data supplied by the industry, the HNO_3 tank level (tank 9 and tank 8 – both are capacity of 20000 L) was little higher than they reported. Also, according to the register maintained at the gate, DMS should be 24.980 MT. But they claimed that only 22.9 MT of DMS unloaded into the tank 9. Thus, there is no information about 2.08 MT of DMS. Also, there is no explanation of another DMS tanker (34.330 MT from Kutch Chemical Industries) which arrived in on the day of accident (9:20 AM on June 03, 2020).

3. As per the reaction scheme, H_2 is required to produce 2, 5 DCA from 2,5 DCNB. The analysis shows that industry used to buy 2, 5 DCA which they are supposed to produce and use for the process. But there is no information on why they used to procure H_2 as well as 2,5 DCA both. If the unit is receiving H_2 and 2.5 DCA both, unit must be producing something else using H_2 which would not be there in the consent. Also, according to the tank farm design, there is no tank designated for 2,5 DCA. But industry used to store 2, 5 DCA in one of the tanks (tank 2). They did not fill the tank level properly in the required tank farm form. Based on the consumption

pattern of May 28, to June 02, 2020, the Dicamba production per day found to be about 10 to 15 MT. From the mole balance it is found that to produce 10 MT/day Dicamba production, they need ~4 MT of HNO_3 and 6 MT of DMS in a day. This suggests that HNO_3 tank content was more (atleast 4 MT – amount require for one day production) than their claim (0.9 MT).

4. Also, Dicamba production data reported by the industry is 563 MT Dicamba during March to May 2020. However, DMS consumption data shows that the actual production in the tune of 1137.9 MT during those three months. The consumption data of other raw materials is also not matching with industry's claim.
5. After considering probable chemical reactions in the storage tanks 5, it is pointed out that there was a possibility to form about 1.24 ton of TNT (only from Tank 5) capable to release 5.18 GJ or 1.43 MWh of energy. The reactions are exothermic and expected to rise the tank temperature. Admittedly there was no temperature measurement on the tank. The report dated 10th June, 2020 is also considered and it is pointed out that "as temperature measured outside the tank of mixture was 84° Celsius and vapour fumes were already formed inside the tank, we can't (were) not able to take sample of this mixture for analysis purposes considering the risk of explosion and toxic effect to any person". It is also noted that the persons were spraying water on a tank No. 5 continuously to control the temperature as admitted by the unit persons. When the heated mixed materials (DMS & HNO_3) transferred through pump from Tank 5 to tank 9, the more DMS decomposed due to water available in the tank 9. Also, as the extra energy imparted by pump, the mixture was more reactive and continuous pumping into tank 9, left very less room for vapors in the tank 9. Also, an increase temperature favoured the decomposition of HNO_3. Vapour being flammable and explodes when heated. During the explosion all other tanks with combustible materials (e.g. 2,5 DCA, 2,5 DCNB, DMS, ODCB etc.) on the ground were also contributed as fuels and large energy liberated through the explosion.
6. The expert expressed an opinion in detail. So far as consumption

and details of production are concerned, the expert has pointed out the need for the materials for 1 MT of Dicamba in table 4C. The committee has figures from the GPCB, MoEF&CC and DISH. Considering the figures supplied by the unit for the months of March 2020 to May 2020 to all the aforesaid 3 agencies are 563 MT, 541.7 MT and 591.1 MT accordingly. The said intimation in a table format is annexed here with collectively and Mark **Annexure 29**. Why the unit gave information to all the agencies for all the 3 months different figures of having manufactured the product? More surprisingly, on the basis of consumption overall material it appears that the unit must have produced 1137.9 MT of Dicamba. From this it is clear that unit was conveying the convenient figures to the different agencies. Considering the consumption of the raw material as per calculations production would be more than double and the same is not shown or some other chemical has been manufactured and for which no intimation is given to any authority. Consumption and production details are as under. Please refer table 4C in **Annexure 28**.

Sr. No.	Month	Name of Raw Material	Actual Consumption Quantity (in MT)	MT of Raw Material required for 1 MT of Dicamba	Expected Dicamba production (MT)
1	March 2020	DMS	205.585	0.601	342.1
2		HNO_3	103.120	0.434	
3		*Hydrogen**	*67479*	534	
		Hydrogen	6.065	0.048	
4		DCNB	137.000	1.397	
5		2, 5 DCA	173.100	1.076	
1	April-2020	DMS	181.500	0.601	302.0
2		HNO_3	102.000	0.434	
3		*Hydrogen**	*57025*	534	
		Hydrogen	5.125	0.048	
4		DCNB	113.500	1.397	
5		2, 5 DCA	108.000	1.076	

1	May 2020	DMS	296.765	0.601	493.8
2		HNO_3	145.760	0.434	
3		*Hydrogen**	*83855*	534	
		Hydrogen	7.536	0.048	
4		DCNB	150.000	1.397	
5		2, 5 DCA	180.000	1.076	
		Total			**1137.9**

7. Recommendations to avoid future incidents and other questions are as per the report Mark **Annexure 28.**

SECTION 8

STEPS REQUIRED TO AVOID SUCH INCIDENT

(NATIONAL DISASTER MANAGEMENT AUTHORITY)

55. The question is how such accidents can be avoided. There is National Disaster Management Authority (NDMA) of the Government of India, which has issued guidelines for Chemical Disasters (Industrial).

56. *The common causes for chemical accidents, deficiencies, safety management system and human errors are noted. The chemical accidents fire, explosion and/or toxic release were resulting irreversible pain, suffering and death. To minimise such accident and to improve emergency preparedness at all levels, substantial efforts are still required to predict the occurrence of disaster.* ***(Page xvii)***

57. It *is also stated that it has been realised that effective Chemical Disaster Management (CDM) is possible by the adoption of preventive and mitigation strategies as most chemical disasters are preventable in comparison to natural disasters that are difficult to predict and prevent. Statutory inspection, safety audit and testing of emergency plan, onsite emergency plan, offsite emergency plans, medical emergency plans,*

information on chemical, technical information have been given importance.

58. *It is indicated that the disclosure of information via Material Safety Data Sheets (MSDS) by occupiers to workers on chemical hazards is a statutory requirement. The information in MSDS is generally complex and exhaustive, therefore, supervisory staff and workers find it difficult to comprehend the information available to them.* (In the instance case, the workers have not been questioned by the officers of the DISH in this regard. Why? If they would have been questioned, the officers would have known that the unit is conveying about the hazardous chemicals)

59. *It is specifically indicated that No Objection Certificates (NOCs) for establishing a storage facility often lack sufficient scientific knowledge and need to undergo appropriate training.*

    Before granting the permission of tank farm by the relevant authority, if they would have studied the effect of mixing the chemicals even by accident, they would have realized that certain acids cannot be kept nearby, if they would not have allowed Nitric Acid in the tank farm area and would have asked to store at separate place the accident could have been avoided.

60. ***In Chapter- 4****, it has been suggested that [Page 23 (viii)], Factory Inspectorates should be empowered commensurate with their responsibilities. Authorities under Rule 19 of the MSIHC Rules further empower them to issue improvement notices. It is necessary to empower them to take legal actions for noncompliance of MSIHC Rules except for defence and nuclear installations, which are taken care by CFEES and DAE respectively. It is also pointed out that an authentic but simplified version of information on HAZCHEM through MSDS is needed for ready use on the shop floors, both by the supervisory staff and workers. It is also advised*

that the MSDS will be displayed in multiple languages i.e., English, Hindi and the regional language and/or the vernacular language and to be displayed prominently at strategic places like shift office, notice boards, security gates and also on the tankers. Dos and don'ts and periodic training capsule of MSDS on relevant chemicals have been insisted.

61. ***In Chapter- 5***, it has been specifically indicated that a *prime area of concern is the strengthening of the industrial systems for the prevention and management of chemical accidents*. ***Such as provisions shall be established to continuously reengineer (improve and upgrade) the system.*** As a part of government policy, it is envisaged that the present regulatory inspection and monitoring framework will evolve measures to encourage self-regulation, public consultation and PPP.

62. **About the storage,** in ***Para 5.2 in Chapter 5***, it is observed that the storages of HAZMAT in an installation, or isolated storages are major sources of chemical disasters. The existing legal regulatory requirement provided through The Petroleum Act, 1934, the Gas Cylinder Rules, 2004, the MSIHC Rules, 1989, and the Factories Act, 1948, and various Rules framed by the states give comprehensive guidelines to all installations and storages for the purpose of maintenance and operation of storage, tank farms and vessels. ***However, there are some glaring gaps with regard to safety, containment and neutralisation of toxic spill and release at the installation and storage site. Necessary provisions need to be enacted for fail-safe safety measures.***

63. In Chapter-5, under the Storages, Paragraph 5.2 (v) indicates that Comprehensive guidelines for safe storages, testing and monitoring of storage vessels and areas, and for checking the residual life of vessels, pipelines and other equipment used in storage of HAZCHEMs. In addition, a testing system, its frequency and a certification system also exist. ***However, there is an urgent need of critical evaluation and review***

pertaining to the following areas:

a) Defining and ensuring the limits of quantity of HAZMAT as per the capacity.

b) ***Simultaneous storage of non-compatible hazardous and toxic.***

64. Reading the guide lines it is clear that on 13.04.2007, guidelines were published, however, till today no authority concerned with the subject has thought it fit to make Rules or issue guidelines for allowing storage of certain materials together in one tank farm. The authorities have failed to digest the report where it is specifically conveyed that there is need to have ***continues reengineering system to improve and upgrade. Necessary provisions need to be enacted for fail-safe safety measures* and *there is an urgent need of critical evaluation and review pertaining to simultaneous storage of non-compatible hazardous and toxic.*** The concerned authorities were satisfied by reading the observation. They failed in carrying out the specific massage about the storage of hazardous chemicals. There were 14 tanks on ground. Between the tanks of DMS and Nitric Acid which were in raw of two, there were two tanks of Sulphuric Acid in raw. If the authorities would have issued guidelines with regard to the storage of not storing incompatible materials together the situation could have been avoided.

SECTION 9

RECOMMENDED SAFETY-STEPS

65. For the purpose of unloading the chemical at present, the hosepipe of the unit with name tag of chemical is used which is of a common size which can be attached or fasten to any tank with the aid of a coupler. If the inlet of the tank is of different seize than that of a tanker outlet, situation can be avoided. (to avoid the pressure, inlet diameter of the tank may be of a little larger size than the out let of a tanker) One need to use inlet of a

tank which may be of a slight larger size with a coupler of that size to connect the adopter. The other end of the adopter or a connector having normal size of coupler to fix that end with the tanker. This system will assure that the correct adopter is taken to connect otherwise it want fit and for better safety the adopter may remain with the authorised person who will be answerable. In a small tank farm like the present one only one tanker be allowed for unloading the chemical. The other course open may be of a reverse thread system for certain tanks containing incompatible chemicals. For better safety, incompatible chemicals should be stored at the different place as indicated in the policy. With inlet of the tank of different diameter than the outlet of tanker is adopted, fail-safe safety method will not allow a wrong connection of tank with a tanker.

66. Each tanker is used for particular Chemical/acid and therefore, tanker transporting particular chemical should have the outlet of the size that matches the hosepipe to connect the tank having a diameter of the inlet of the tank.

67. In the instant case, even looking to the **pictogram, name of the hazardous chemical on the tankers and corresponding tanks** it would not have been difficult to identify the material in tank as well as tanker and it would not have been difficult to connect the hosepipe with the tank storing the same chemical. Despite the names, written in much large fonts clearly as admitted by the person who connected hosepipe, how he committed the mistake. (For transporting hazardous chemicals, sub rule 9 of the Motor Vehicle Rules, imposes strict conditions on a person driving a transport vehicle carrying hazardous chemicals. He must have ability to read and write at least one of the languages specified in VIII schedule of the Constitution and English and must possess a certificate of having successfully passed a course indicated in the syllabus and periodicity connected. The syllabus if read it becomes clear that driver to carry hazardous chemicals must be trained in any of the Institute recognised by the State Government for the period indicated.) As a person would know

the language, for the purpose of easy unloading would park the tanker near the tank. The hosepipe would not be so long that from any corner of the tank farm, the tank can be connected. He is aware about the pictogram and the hazardous chemical contained in the tanker. In short, the driver would know the language and where to park the tanker for unloading the chemical. He would not park his tanker opposite the tank which contains different chemical. These aspects have not at all taken into consideration by the officials of the DISH and it seems no inquiry has been made).

The person who connected the tankers with the tanks was not authorised person to work as tank farm operator. It was duty and responsibility of tank farm operator to connect the tankers with the tanks.

SECTION 10

STORAGE OF HYDROGEN CYLINDERS

68. As reported two trucks carrying hydrogen cylinders were seen during and after the accident in the photographs and the same is mentioned in the panchnama drawn by the Police Authority. However, the trucks of hydrogen cylinders were not seen by the members of the committee during the visit. The question is why the trucks were removed and with whose permission? The DISH has explained that the trucks were removed from that place as they posed fire/explosion hazards and considering safety factor to prevent another accident, the trucks were removed from the premises urgently. However, there is no answer whether the trucks were removed with the permission of any one or not.

69. The report dated 1st July,2020 indicates that as directed by Joint Chief Controller of Explosives (HOD), Nagpur, a team of officers comprising of Shri V.B. Borgaonkar, Dy. Chief Controller of Explosives, Shri Sanjay Kumar, Controller of Explosives and Shri Kunwarpal Singh, Dy. Controller

of Explosives visited M/s.Yashashvi Rasayan Ltd, Dahej, Distt: Bharuch (Gujarat) on 04/06/2020.

70. As per report, the accident did not occur in the premises or installation licensed by the PESO. The unit is required *to follow the provisions contained in the Gas Cylinder Rules, 2016, schedule 3 of MSIHC Rules, 1989* and *Petroleum Rules, 2002*. The unit was licensed by the PESO, the storage of 80 Cylinders SO_2, 90 KL Petroleum Class A, 180 KL Petroleum Class B, 9 nos. of tanks of 30 KL storage capacity each (2 tanks for storage of methanol (Petroleum Class A), 5 tanks for storage of Xylene (Petroleum Class B) and 2 storage tanks for high-speed diesel (Petroleum Class B). All underground storage tanks were found intact except breakage of above ground pipelines. The unit was also licensed to store 40 KL Liquid CO_2 in 2 storage vessels (20 KL each) under *Static and Mobile Pressure Vessels (U) Rules, 2016* were found intact. As the PESO licensed premises were found severely damaged and were adjacent to chemical storage tank farm and found not fit for further operations, the licenses granted by PESO were suspended as an interim measure on 05/06/2020.

71. The PESO found 282 Hydrogen Cylinders near CO_2 bulk storage and the tires of the trucks as well as hydrogen cylinder cascades were found burnt. But the hydrogen cylinders were not exploded. It was not possible on account debris, to ascertain whether the hydrogen gas in the cylinders has burnt out completely or not.

72. On behalf of the Unit it was conveyed that the unit is holding license for storage of hydrogen cylinders cascades. However, on perusal of the office records of the PESO, no license was issued to the unit for storage of hydrogen cylinder cascades. The PESO has taken appropriate action against the unit as well as the suppliers of hydrogen cylinders. The PESO advised not to remove the debris or the

Cylinders or any Petroleum Products Stored without obtaining the permission from PESO. The officials of the units were advised not to remove any debris or cylinders or transfer petroleum products stored in the underground storage tanks without obtaining permission from PESO.

73. However, when the team visited the unit again on 9th June,2020 it was noticed that the unit shifted the fire exposed hydrogen cylinders. The officers visited the place where the Cylinders were shifted for examination and testing and the officers observed that copper tubing/ manifolds connecting hydrogen cylinders were broken at multiple locations. The valves of many hydrogen cylinders were missing. According to the report it is proved that in the post explosion fire, hydrogen gas from all 282 cylinders of 160 L volumetric capacity each was completely burnt. Hence, the hydrogen cylinder owners were called upon to immediately send the cylinders to the manufacturer of cylinders i.e. M/s. Everest Canto cylinders, Gandhidham, Kutch for examination and testing as required under Rule 24 of Gas Cylinder Rules, 2016 and also to take necessary action under intimation to the PESO office.

74. On the second visit the unit was asked to produce the license for storage of hydrogen cylinders However, the unit had no license and thus the unit was storing hydrogen Cylinders in contravention of Rule 43 of Gas Cylinder Rules, 2016. In view of this show cause notices were issued to M/s. Yashasvi Rasayan Limited, the unit in possession and for contravention of the Rule as well as to the manufacturer/filler of hydrogen gas cylinders, M/s. Gujarat Alkali Chemical Ltd. and supplier / transporter of hydrogen gas cylinders i.e. M/s. Ideal Chemical (I) Pvt. Ltd., Vadodara as well as M/s. Goel MG Gases Pvt. Ltd., Ankleshwar, Bharuch. The report indicates that the action will be initiated after the response is received.

75. Dy. Chief Controller of Explosives, Vadodara and Shri Sanjay Kumar, CE were present in the meeting of the Committee and have submitted their report dated 1st July, 2020 stating that no investigation from PESO is required to find out the root cause of the accident since above said devastating explosion followed by massive fire occurred in chemical storage tank farm and not covered under any license granted by PESO. In the report Further it is stated that the company has submitted information as per Schedule 6 of MSIHC Rules, 1989 i.e. 'Information to be furnished regarding notification of major accidents' to DISH as required under Rule 5 (1) of above said Rules.

76. The PESO has given its recommendations. (The Report is annexed herewith Mark at **Annexure 30**).

SECTION 11

DAMAGES

77. The question of damage caused to the environment is an important aspect. On account of the fire/explosion, fire tenders came to rescue. With the help of firemen, the situation was brought under control. However, for extinguishing the fire, lot of water, not only of the fire tenders but also of the unit was utilised. The water mixed with chemicals moved through the drains / storm water drains of SEZ/GIDC. In all 406 KL water was used for extinguishing the fire. About 140 KL waste water was collected in the drain of the unit. About 4 KL waste water was found in the storm water drain of the unit itself. Approximately, 262 KL wastewater drained out of the unit premises. The wastewater generated on the date of incident ultimately was carried over to storm water drainage of SEZ II near the main gate of the unit. The wastewater samples collected were analysed. According to the report, pH and COD exceeded the standards

prescribed by GPCB. The copy of the said report is annexed Mark Annexure 10.

78. On 16th June, 2020 a Meeting was convened at Dahej along with Collector, DSP, DISH, PESO officials. The Committee members along with other officials visited the accident site and observed the spot of the accident and damage caused in premises of the industry. Industry representative Shri Yash Patel along with his staff was present during the visit and shared information about the accident. The Committee members could not go near to tank farm area where accident/explosion took place due to safety reason as advised by experts. CPCB and GPCB collected three samples of wastewater from different places accumulated in the storm water drains generated during the firefighting operation. This makes it clear that though earlier direction was given by GPCB to remove wastewater, unit did not remove wastewater from the channel and remain in the channel. The water was contaminated due to spilled raw materials viz. Conc. Nitric acid, Di-Methyl Sulphate, Cons sulphuric acid, Caustic Potash Lye, Caustic Soda Lye etc. on analysis, pH, TSS, COD, BOD were found higher than the norms prescribed by the GPCB. The report of visit and analysis is annexed herewith, **Annexure 31**.

79. The members of the Committee (NEERI, MoEF & CC & CPCB) along with the officials of the GPCB visited the unit and the stormwater drain of Dahej SEZ II and its meeting point to the see near confluence of river Narmada to the Gulf of Khambhat (Cambay) as decided in the meeting on 29-06-2020. The wastewater in storm water drain inside the premises was found dried in comparison to earlier visit on 16th June, 2020. Wastewater from the other drains of the premises were transferred to collection tank of ETP. The hazardous waste was not properly stored and the same was required to keep in drums with labels keeping proper distance between the drums. The same was required to be incinerated. The members carried out the inspection of common storm water drain from unit premises up to its meeting to SWD point which is made of RCC structure.

Substantial quantity of water on account of rain, domestic sewage contaminated water from the industries and stormwater from Dahej SEZ II was observed in common SWD which was blocked near Jetty and no water was flowing. The water was blocked temporarily by making earthen Bund from 30th May, 2020 on account of construction as detailed in the report for protection of road and other area from the sea water tied. Thus, it is very clear that no wastewater entered the sea. It was informed by the GIDC that the storm water drains of SEZ II will open from 1st July,2020. In view of the prevailing conditions in heterogeneous nature of water in the common SWD, the expert committee did not collect sample of water from the storm water drains as the contribution from individual unit could not be ascertained. The copy of the report is annexed here with and Mark **Annexure 32**.

80. There are reports about the air pollution as well as water pollution. The reports prepared by GPCB for analysis of samples taken on 3rd June (Air & Water) and 10th June (Air), and sample taken by GPCB/CPCB on 16th June (Water) are indicating pollution in the environment. The copies of the reports are annexed herewith and collectively marked as Mark **Annexure 33**. The water used for firefighting resulted into contaminated water spread within the premises, collected in storm water drain within the premises and also flown out of premises in the storm water drain of SEZ-II on 03.06.2020. The roads outside the unit are paved by R.C.C., there was no chance of percolation of wastewater. On the basis of Chemical Oxygen Demand (COD) of the firefighting wastewater, as per GPCB analysis results, flown out of premises is used for calculating the water damage cost which comes out to a negligible amount (in hundreds) and therefore not considered by the Committee. Whatever damage of soil within the premises is due to spread of burnt chemicals and contaminated water generated out of firefighting operation. Since the use of land (soil) within the industry premises is not for agricultural purpose besides being coastal land, which is mostly non-fertile in the region, the cost of soil is not used in damage calculation, moreover, there is no damage to the soil on open

land.

Air environment damages due to combustion of chemicals in the accident leading to release of air pollutants and CO_2 (which is a green-house gas) needs to be accounted for air environment. The damage cost estimation for air emissions will have to be carried using various tools and techniques under assumptions. Since there are different type of chemicals, the stoichiometric pollutant formation needs to be studied followed by the cost estimation due to its release. This study would require at least three weeks' time and therefore additional time is requested. The said report submitted by NEERI is annexed herewith Mark **Annexure 34**.

81. So far as compensation to the deceased is concerned, the salary drawn and in case of daily wagers or on a contract basis wages per day are taken into consideration for arriving at a conclusion as to what should be the amount of compensation to be paid to the heirs of the deceased. The persons sustained injuries and succumbed to the injuries. All innocent workmen sustained injuries not on account of their act of neglect or while discharging their duties came in contact with machinery or the chemicals. The unit was required to take strict measures for unloading the hazardous chemicals, but has failed in taking care while dealing with hazardous chemicals. Even after acquiring the knowledge on 2nd June, 2020 that incompatible hazardous chemicals mixed in storage tanks, the unit did not stop the process in the factory and allowed the workers to work. Even on the next day, 3rd June, 2020 as if nothing has happened the unit commenced the process as usual. This indicates that the unit without bothering for the life of a human being continued with the operation of the unit in a normal way for gain. Therefore, this being an act with the knowledge of the consequences of incompatible chemicals to explode that will result in death needs strict action. It was not an act of accident. The officials were not only highly qualified in the subject of chemical engineering, but had long experience in the manufacturing of chemicals and therefore, were aware about the consequences. The presumption is required to be raised that they were qualified and experienced. The table

is drawn giving all the available details of the persons who succumbed to the injuries with calculations to indicate the entitlement of the heirs of the deceased. The said table is annexed herewith Mark **Annexure 35**. The unit submitted a statement on 28th June, 2020 that they have paid ₹1,13,13,505/- as against their commitment to pay ₹1,45,13,505/-. It is also stated in the statement that for hospitalisation of 49 persons, the unit has paid the sum of ₹58,87,292/- for medical expenses and nothing is required to be paid for medical expenses now. The report submitted is annexed herewith and Mark **Annexure 36**.

82. So far as the persons who sustained grievous hurt are concerned, till today the disability certificates are not provided. Maybe, on account of the injured having sustained fractures or operated or hospitalised, within a short period it may not be possible to issue a certificate about the percentage of disability. Soon after receipt of the disability certificate for injured persons the committee will be in a position to suggest the amount to be paid to the person sustained, grievous hurt or hurt. The nodal agency of the committee has asked the Collector to forward the disability certificate from a medical officer and inability of a person to work for the number of days is yet not received and the Collector is conveyed about the same again. The committee shall forward the report in this behalf. According to the list forwarded by The Sub Divisional Magistrate 11 persons died on account of the injuries sustained. While 21 persons sustained grievous hurt, 27 persons sustained simple injury and 32 persons sustained minor injuries. Thus, according to the Sub Divisional Magistrate in all 80 persons sustained injuries. The list provided by SDM in this behalf is annexed herewith Mark **Annexure 37**. However, the list submitted by the office of the Collector dated 30th July, 2020 the copy of which is annexed herewith Mark **Annexure 38**, indicates different picture. The list forwarded on 27th July 2020 names of 92 persons having sustained injuries including grievous hurt. However, in a list certain column are not filled in to find out the nature of injury etc. If such names are deducted, total number of injured persons would be 64 persons. In a list received recently (30th July, 2020) indicates 22 persons sustained grievous hurt and

28 persons sustained simple and 43 persons sustained minor injuries. The persons sustained minor injuries were not hospitalised. We find that the list is not properly synchronised and no proper exercises done. However, according to the list as of 11 persons who died have been paid or not, it seems that the unit has shown having paid more than Rs. 15 lakh by way of ex-gratia amount and therefore no further amount is paid by the Collector in case of 3 persons who died. To the heirs of one deceased person, the Collector has paid the amount of difference while in case of 3 deceased, the matter is under process. For remaining 4 deceased unit has not paid any amount however, the Collector has made payment in case of one deceased while other 3 are not paid. So far as the persons who sustained grievous hurt, the list forwarded by the office of the Collector indicates that 19 persons have been paid however, 3 persons are yet to be paid. So far as the persons sustained hurt are concerned, the payment has been made to 26 persons and 2 are yet to be paid. Possibly this amount is not paid as they had not opened the bank account. A comparative table is prepared to give an overview picture as to amount paid and by whom. The said list is annexed herewith mark **Annexure 39**.

So far as deceased persons are concerned, considering their monthly salary, whether he was on the role of the unit or not, or whether he was a daily wager, or a workman of a contractor and what was the amount paid towards wages have been taken into consideration along with multiplier and other expenses and loss of enjoyment. In a list giving the names of the deceased and all other details by considering appropriate multiplier the committee would request to consider for compensation. A table is annexed herewith showing the amount of compensation suggested to be paid to the deceased mark at **Annexure 35.** For a quick look, the names of the deceased with age, earning per month, multiplier and entitlement are shown as under-

Sr. no.	Name	Age	Salary if permanent per month	Multiplier	Compensation
1	Rashmikant Chauhan	35	66946	17	1,15,42,738.00
2	Naresh Prajapati	26	20168	18	40,67,216.00
3	Krunal J Patel	27	19851	18	40,15,862.00
4	Surajlal B Singh	35	10350	17	20,77,980.00
5	Munnasing Shiv prasadsingh Kori	28	10350	18	21,64,920.00
6	M D Mazar	25	10350	17	20,77,980.00
7	Pramod Yadav	24	10350	17	20,77,980.00
8	Arun Buddhsen Kori	20	9750	16	19,10,400.00
9	Jayant Mahanto	28	10350	18	21,64,920.00
10	Hari Darshankumar Chaudhary	20	9750	16	20,10,400.00
11	Tripuraikumar Roy	25	9750	17	19,92,300.00
Total Compensations					**36,102,696.00**
Rupees Three Crore Sixty One Lac Two Thousand Six Hundred Ninety Six Only					

83. With regard to the damage caused to the properties of the villagers and damage caused on account of environment witnesses appeared before the Committee. Shri Jayantibhai Manabhai Ahir, Ex-Sarpanch, village Luvara, stated that about 375 houses were damaged on account of explosion and one person sustained a minor injury. However, he had no evidence to substantiate the extent of damage caused to the houses. Shri Raisangbhai Raijibhai Rathod, Sarpanch Luvara Gram Panchayat, Tal. Vagra, stated that in view of the applications given by the villagers complaining about the damage caused to their houses, the unit was informed and a survey was carried out to find out the extent of damage caused to 465 houses. About a boy having sustained an injury on account

of falling material, he stated that the unit is treating the injured boy and is also providing a vehicle. He further stated that the company has agreed to pay compensation for the injury sustained. He further stated that an estimated amount for damages to the villagers to the tune of ₹18,22,280/- has already been paid. The unit paid 90% of the amount to the persons affected on account of damage to the houses. More than ₹5 lakh are yet to be paid. It is also stated that they are committed to make the payment in all of ₹23,78,980/-. Witness further stated that the greenery is affected on account of operation of number of factories in the area. He pointed out the need for the hospital as well as fire station in the area. Shri Jitendrasinh Hathisinh Chavda, Ambheta, Tal. Vagra, Dist. Bharuch, stated that residents of village Luvara were shifted to village Ambheta. He stated that the people who were shifted are not satisfied with the amount of compensation. He stated that everyone was paid between ₹4000 to ₹5000. The people from village Luvara came at about 2:30 PM and returned by 12.00 hours (mid night). He further stated that they came in buses of State Transport, Reliance Industries and other Industries arranged by the administration. They returned by government buses. He also stated about a person who sustained an injury which was not bleeding one. He stated that the residents of village Luvara were paid ₹17 lakh. The Director of the unit did not say that the amount was paid. It is required to be noted that no person whose house was damaged or shifted to another village on account of apprehended danger appeared before the committee. The persons who appeared and claimed that the amounts were paid was neither a receiver of the amount nor a representative of the persons nor produced any material to show the receipt of the amount. However, the director of the company has not referred this aspect at all. Neither the claimant nor the receiver of the amount appeared. A list was given dated 28th June, 2020 to indicate that the sum of ₹16,54,810 were paid to 332 persons of village Luvara on 19th June,2020 by cheques (number of which are also mentioned). However, the office of the Collector forwarded two lists, one indicating the claim amount by 360 persons claiming Rs.13,77,855/-, the other list of payment of Rs. 26,66,930/-to 480 persons. (One under process and for five there is an agreement) these three lists are annexed herewith Mark **Annexure 40**. No

material has been placed by the office of the Collector to show that any of the displaced person is paid as directed by the Hon. Tribunal before the committee. In all 3241 nos. of people as per the list forwarded by the office of the Collector (Mamlatdar Vagra) were shifted for their safety on account of apprehended danger and they are required to be paid.

84. One Shri Pravinbhai Madhiwala, a Fisherman, stated before the Committee that after the blast in the unit there was rain. He received a telephone from his friend that the dead fishes were lying on the sea shore. On reaching the site after verifying, he contacted the officer of GPCB. Immediate visit was made and sample of water was collected for examination. According to him Fisherman are not getting a particular fish named 'Hilsa'. As stated by him this fish is available only during monsoon season. His request was that the polluted water should be discharged in the high sea so that the fishermen would not be adversely affected. He claims that on account of non-availability of the fishes, he suffered a loss to the tune of 25,000 in this season. He further explained that 'Hilsa' fishes are available in the Narmada river. He was not sure about the date on which he complained to the GPCB but he was sure that officer of the GPCB arrived on the same date when he telephoned. He stated that as per the GPCB record fish-kill incident took place on 12th June, 2020 the date of intimation may be on or about 12th June, 2020. The report of the analysis of water is annexed herewith Mark **Annexure 41**. The Department of Fisheries also carried out the exercise to find out the cause of fish-kill and the report in this behalf is annexed herewith Mark **Annexure 42**. It is observed from the report of GPCB that 800-1000 nos. of dead fishes were observed in the small shallow stretch having 3-4 feet wide and 30-40 ft length towards the Sea, no dead fishes observed nearby location. Outlet of storm water drain of SEZ-II area, were found blocked due to civil work of culvert box and there was no direct discharge of industrial wastewater or any other water observed. The two samples of accumulated water from pond on the shore were collected and observed that DO: 3.26 & 2.3 mg/l, BOD: 18 & 35 mg/l, COD:152 & 242 mg/l NH3-N: 14.02 & BDL mg/l etc. Dissolved Oxygen is found to be less. Fisheries Department also carried

out inspection of the site. As per letter from Fisheries Commissioner, Bharuch to GPCB, it is observed that fishes were died due to insufficient water/ lack of oxygen and primarily there is no indication that fishes died due to pollution.

While connecting accident and resultant pollution from the unit, it is found that the incident of fish kill was on 12.06.2020 whereas accident took place on 03.06.2020 and there was no discharge from Storm water drain (SWD) from SEZ-II area where the contaminated water arose out of firefighting operations flown into SWD. SWD was blocked due to civil work of Culvert box from 30.05.2020 to 30.06.2020 as per GIDC information. Therefore, fish kill and accident at the unit cannot be co-related. (The report at **Annexure 32** is produced in this behalf.)

85. Other witnesses appeared and strongly advocated for the Hospital and a Fire Station to cater the need of the persons in area. Looking to the area of SEZ, number of factories, number of persons working in these factories and the people residing in the SEZ area and close to it, the request was made by the witnesses for these facilities. Hospitals are at a distance of more than 50 KM. if in the area itself the provision is made would be in the interest of the more than one lakh of people working and many residing in the area. If nearby facility would have been there, the immediate treatment might have reduced the number of casualties. Looking to the number of factories operating, and the nature of chemicals used, the need to have a fire station was the question. However, In Dahej SEZ, Fire station is functional with 37 Nos. fire staff and having 2 Nos. Fire tenders. At present, Fire station building is already constructed in SEZ Part-1 and another fire station building in SEZ Part-2 is proposed for which tender has been invited by Dahej SEZ Ltd. (DSL). In case of any emergency, DSL fire station will take help from DMC (Disaster Management Centre), Dahej and nearby industries in GIDC area. Over and above the Industries operating in the area have fire tenders as reported.

86. Witnesses on behalf of companies appeared and lodged their claims on the certificate of the staff member or other experts. Thermax Ltd, a company adjacent to the unit, suffered not only damages but two persons succumbed to the injuries and other 11 sustained injuries. This indicates the effect of explosion. For the deceased, it was stated that the contractor was helped by the Company under whom the deceased were working in Thermax Ltd, for making all arrangements to take deceased dead bodies to their native and company has decided to pay to the next of kin of each deceased the sum of ₹10 lakh. It was also stated that for the treatment of injured the amount was paid by the Company. The Company has taken the insurance of plants, buildings and machinery. About the damages it was stated that it was an estimate only and the surveyors report will be submitted later. The claim made by this company is to the tune of ₹24, 83, 31, 000/-. No doubt company must have suffered and same is covered under the insurance.

87. Reliance Industries Ltd, made a claim of ₹8.96 lakh for the damage caused to the windows, falls ceiling and shutters. It is further stated that the damage caused is being assessed and will take about a month or so to get the report. The extent of this claim is assessed by the officer of the Company.

88. Gujarat Chemicals & Port Terminal Co, made a claim of ₹23.75 lakh for the damages which is required to be certified by the civil engineer of the company.

89. On behalf of Adani Port, witness stated that their engineer has estimated the damages to the tune of ₹7.76 Lakh and have not claimed from the Insurance Company. The author of the application did not remain present and there is no clearance for lodging the claim by the Head Office. Person who assessed did not remain present.

90. Aforesaid four Companies only lodged their claims however, there was no authentication or where ever the officer working in the company supported the claim, it was merely a certificate of estimate and the officer did not appear before the Committee. Looking the contents of the applications it appears that other Companies suffered damages. The Collector has forwarded the list of the persons who made the claim. The summary prepared is Annexed herewith and Mark **Annexure 43** along with the claims. Three industries who suffered damages and appeared forwarded some details which are Annexed herewith and Mark **Annexure 44**. The evidence is not sufficient to entertain the claim as made. Some stated that the damage caused is much more and the same is being assessed. However, without the evidence in detail about the loss suffered and without tested effectively by cross examination by the other side it is not possible to entertain such claim. As against this, the committee examined the matter for compensation to be paid to the next of kin of the deceased persons. The explosion and its consequential effects on the persons who succumbed to the injuries is not in doubt or the persons who sustained grievous hurt or hurt on account of blast/fire is certified by the Medical Officers who treated the persons. The deceased income as well as age is a matter of record collected by the officers of the Collectorate from the unit. On these admitted facts the amount of compensation is assessed. Even about the damage on account of air pollution is to be calculated by the experts. Thus, on appreciation of the material on record the recommendation is made by the committee. M/s Camlin Fine Sciences forwarded its claim to the Collector after the period prescribed in the notice and after the evidence was recorded. The application is annexed herewith Mark **Annexure 45**.

91. There is an order made by the competent authority for the closure of the unit in view of the accident that has taken place. More than a month's period has passed. The committee is of the opinion that for the restoration of a plan, it is necessary to make recommendations to the

authorities which have made the orders soon after the incident of closure or for not removal of debris etc. Except GPCB, no other authority such as PESO or DISH were approached by the unit to modify the order made by the authority concerned so as to enable it to remove the debris. The GPCB did receive an application for restoration of power supply for a limited purpose of removal of debris. No doubt earlier, during the visit it was reported that the cylinders are lying below the debris and it would not be advisable to remove unless the experts are engaged in this behalf. The unit conveyed earlier that they already consulted experts for removal of debris however, it is not brought to our notice that an application has been made except to GPCB for modification or cancellation of the orders. Step-by-step actions will have to be taken. The unit is required to submit its restoration plan. The representative of MoEF&CC is to work as a nodal agency on this behalf. It appears that the unit has not made any attempt by approaching to authorities for removal of debris except GPCB for restoration of supply. As informed by the District Magistrate that the debris is not removed and there is no detailed analysis of damage on account of accident by the competent authority. However, the Collector is of the view that removal of debris is necessary for inspection and technical analysis. The Collector conveyed that only thereafter in consonance with the direction given by the Hon'ble Tribunal the restoration plan can be drawn.

In view of the accident which took place on 3rd June, 2020, GPCB has already made an order of prohibiting the operation of D.G. set. In view of the issuance of an orders made by GPCB, the supply of electricity is disconnected. Considering the nature of the accident, the cylinders lying under the debris and hazardous chemicals which may be in the pipeline, it is not advisable at this stage to restore the supply of electricity which has been disconnected. However, considering the question of removal of debris and request of the unit to supply the electricity for removal of debris, the committee is of the opinion that the supply is not to be restored but a temporary connection may be provided to the unit. The supplier as well as the unit under no circumstances shall connect the supply to any installation and the unit shall not use the supply for other than the removal of debris.

Under the circumstances, the committee is of the view that the authorities are recommended after the videography as per their requirement, to allow/permit to remove the debris by following all the directions that may be issued by the authority in accordance with the provisions of laws applicable and without committing breach of any of the provisions or directions, the unit shall remove the debris. The authorities, pending further orders of Hon'ble Tribunal, may exercise their statutory powers in consonance with the direction and if viable. The authorities which issued the orders shall submit the report in this behalf to the committee within a period of 15 days.

SECTION 12

RECOMMENDATIONS

92. **1. Technical points:**

i. There must be the tank temperature indicator with a facility of (1) a siren in case of an emergency / increase in temperature, and (2) the temperature should reflect in the DCS (The office of the responsible officer).

ii. Safety valve of the storage tank to be checked regularly and be recorded in appropriate register.

iii. There should be risk assessment study of chemical plants at certain intervals.

2. Procedure:

iv. There is a need of inherent safer socket design to transfer all liquid materials independently. (The different sizes of couplings of tanks and the pipe connecting the tanker).

v. The tank farm operator must get the connection certified by a responsible officer namely, shift in-charge / H.O.D. before unloading commences.

3. Qualification:

vi. Tank farm operators must be a qualified (ITI – AOCP or B.Sc chemical) with certain experiences.

4. Administrative:

vii. CCTV must be operative for the entire the procedure with a facility to look the same by the officer responsible and data should be saved atleast at two different places including one outside the plat facility. This will help the people to get the data even if something happens in the plant facility.

5. Shortage and training of manpower:

viii. It is necessary to appoint adequate number of Scientists and other officers as well as other staff considering the number of industries so as to effectively monitor the manufacturing units. Shortage of staff is also referred in the report of the Comptroller and Auditor General of India on Environmental Clearances and Post Clearance Monitoring 2016 that there are shortfalls in monitoring of environmental parameters. One of the reasons mentioned in the report is the shortfall/inadequate staff. Considering the numbers of Environmental clearance by MoEF & CC, New Delhi as well as SEIAA Gujarat (No. of ECs

issued by MoEF & CC, New Delhi-Approx. 1500 & by SEIAA-Approx. 8300 for the state of Gujarat only), the scientific staff in Ministry's regional offices should be strengthened for post EC monitoring at regular intervals. Thus, for having an eye over all the units, the Committee feels that the government should take appropriate steps for appointing adequate staff. The PESO also pointed out the same concerned the Gujarat being most industrialized state having about 40,000 licensed premises covered under various Acts and Rules including 1800 Major Accident Hazards premises, this is one of the pressing problems.

ix. The manpower of the DISH in the industrial area must be related to the numbers of units in the area. Considering the incident and the quality of the inquiry made by DISH, it is desirable that proper training should be imparted to the officers of the DISH. This will improve the efficiency of DISH.

6. Tank farm:

x. The entry of tanker should be restricted considering the size of the tank farm area (The authority granting permission should also bear in mind the incompatibility of the different chemicals). The position of the tank in the tank farm area should have direct entry and exit so that the tankers movement will be easy and in an emergency, the tanker can leave the place immediately.

xi. The tank farm operator must follow the directions indicated in S.O.P. strictly for unloading and no material should be unloaded without following the S.O.P.

xii. In view of the incident which took place on account of mixing of incompatible chemicals, the government must come out with a policy with regard to tank farm to avoid reoccurrence of incident on account of hazardous chemicals. It is absolutely necessary to carry out a study on incompatibility of chemicals so as to convey the officer as well industry. The storage of

compatible and incompatible material should be at different places. The minimum separation distance between the storage tank and dyke wall surrounding the tank shall be half of the height of the storage tank. The height of dyke should be one fourth of the height of the tank which should be of RCC structure of appropriate width. This will reduce the effect of any explosion.

7. Management & study:

xiii. HAZOP study direction / instruction must be carried out strictly and regularly by the unit.

xiv. Management to educate the staff on Materials Safety Data Sheet (MSDS) and engineers & operators in the plant must study the same.

8. DCG, Hospitals:

xv. All Industrial Zone/SEZ should have their own Local Crisis Group. The District Crisis Group should give surprise visit to the factories regularly at least once in a quarter and check the operation of factories. At the end of the visit, they should generate a report and submit to the State Crisis Group.

xvi. As per the Chemical Accidents (Emergency, Planning, Preparedness, Response) Rules, 1996, brought out under the Environment Protection Act 1986, it is mandatory to have State Crisis Group (SCG) and District Crisis Group(DCG) to help the State Disaster Management Authority (SDMA) and District Disaster Management Authority (DDMA) under the Disaster Management Act, 2005 in advisory roles to deal with Chemical Disaster Management (CDM). There is no emergency response centre / disaster management centre within the SEZ. Therefore, the authorities must provide urgently such centers. As the Industry in the instant case failed to report in this behalf

there must be a provision for not reporting immediately to the DCG and DDMA or at emergency control room for chemical disasters in the state (as in the instant case it is at Vadodara). The Rule making authority though having prescribed 48 hrs. time limit within which the competent authority is required to be informed but there is no provision for the breach with regard to non-informing immediately or within 48 hrs. (In the instant case it is admitted the report was submitted on 9th June, 2020 against the incident on 3rd June, 2020).

xvii. The requirement of a Hospital in an industrial zone or SEZ and particularly industries are engaged in hazardous chemicals is a must. Even Hospitals at distance of 50 kms are general hospitals and not specialised in chemical burns and injuries arising out of accident on account of hazardous materials.

xviii. District crisis group must undertake mock drill under off site emergency plan and crisis management in every industrial cluster or SEZ on failure action should be taken against DCG. (In the instant case they were satisfied with mock drill in one place in a district. In the instant case in one district there are more cluster of industries. Therefore, in each cluster an exercise aforesaid is a must – DISH has admitted that such exercise is not carried out in all clusters).

xix. As at other places in the state of Gujarat in the industrial clusters, the GPCB has provided tower for air quality monitoring and same is being monitored by the GPCB. Dahej – I & II or the SEZ being an industrial town and factories are particularly engaged in hazardous chemicals, the committee is of the opinion that there should be Continuous Ambient Air Quality Monitoring Systems (CAAQMS) at all strategic locations. So that everyone in that area is aware about the air pollution.

9. Safety audit:

xx. For the purpose of auditing the safety, the government must

make a panel of safety auditors to inspect the factory independently twice in a year and they should submit their report directly to the DISH. The safety auditor should be made answerable to the government.

xxi. The committee is of the opinion that sub-rule (9) of Rule 68(J) of the Gujarat Factories Rules 1963, refers to safety report and safety audit reports, under that Rule sub rule 2 gives a choice to industry to select the auditor for the purpose of the safety audit. The committee of the opinion that the state government be requested to consider the case and particularly safety report from independent auditor and to amend the Rule as below:

2). After the commencement of these Rules, the occupiers of both the new and existing industrial activities and isolated storage must be checked by the government through the safety auditor which is accredited by an accreditation board to be constituted by the Ministry of labour, Government of India.

3). The auditor within 30 days of audit shall send the report to the chief inspector with respect to the audit recommendations and which shall be examined by the government within a period of 1 month and the industry shall be directed to carry out within the period specified the recommendation that may be made by the Government in this behalf.

10. For SEZ / Industrial zone:

xxii. Ordinarily a buffer zone of 500 meter is provided if there is a residential zone. But in case of hazardous chemicals the buffer zone should be of 1000 meter minimum in view of the nature of the chemicals hazards associated with it. (In the instant case it is found that industries are close to village Luvara & Lakhigam). In a buffer zone, industries as well as government should provide proper plantation for pollution free atmosphere to the residents.

xxiii. In SEZ or industrial zone for the benefit of the residents in that area the government should provide sewerage network so that the domestic wastewater generated by the residents treated in the sewage treatment plant.

11. Other recommendation:

xxiv. Constant monitoring is required under the direction of the Hon. Tribunal to the urgent need for expediting the matter of providing effluent pipeline (4.5 km) for deep sea discharge by GIDC as per NIO recommendation to ensure adequate dilution and dispersion of effluent (Despite reminders GIDC has failed).

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