

**BEFORE THE NATIONAL GREEN TRIBUNAL, WESTERN  
ZONE BENCH, PUNE.**

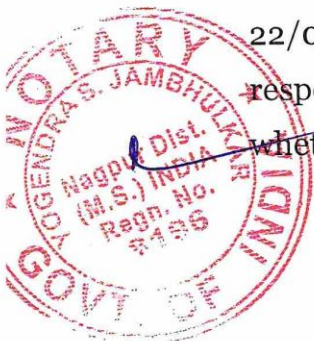
Original Application no. 28/2024 WZ  
[Earlier Original Application no. 796/2023 (PB)]

**AFFIDAVIT ON BEHALF OF RESPONDENT NO. 3 SOLAR  
INDUSTRIES INDIA LIMITED**

**Deponent:** Manoj Kumar Singh S/o. Shri Ram Bachan Singh, aged about 59 years. R/o. Plot no. 15, Darshana Society, Borgaon, Nagpur – 440013, Maharashtra, in the capacity of Sr. General Manager (HR & Admin.) in Solar Industries India Limited. (THE COMPANY).

I the deponent abovenamed do hereby take oath and state on solemn affirmation as under:

1. I say that Solar Industries India Limited (hereinafter shall be referred to as “the company”) has received the notice dated 22/02/2024 issued by this Hon’ble Tribunal, directing the respondent no. 3, i.e. the company to submit reply/affidavit as to whether any persons were injured in the accident and further to



disclose details of persons who have died in the accident. I say that in pursuance to the notice, affidavit came to be filed with this Hon'ble Tribunal and all the particulars in respect of death of persons were duly mentioned and so also it was further mentioned that ex-gratia payment of Rs. 20,00,000/- (Rs. Twenty Lakh) for and on behalf of company was duly paid to legal heirs of each deceased. It was further mentioned that amount of Pension/PF from Employee's State Insurance Corporation (ESIC) and other departments, payable to the family members of the deceased persons is also under process and the same will be disbursed soon to them.

2. I say that this Hon'ble Tribunal in Para 2 of the order dated 9.4.2024 observed that detailed affidavit is not filed hence, in pursuance to which the detailed affidavit is being filed as under :
3. I say that the company was incorporated on 24th February'1995. The manufacturing unit of the company is located at Village Chakdoh (near Bazargaon), Tahsil – Katol, District - Nagpur, Maharashtra. It has its Registered office at "Solar" House, 14, Kachimet, Amravati Road, Nagpur – 440 023 (Maharashtra). The location of manufacturing unit of the company situated in Backward D+ Region as per PSI-07 policy of Government of Maharashtra. I say that, Additional Director, Industrial Safety & Health Department, Maharashtra State, Nagpur has granted permission/license to the Solar Industries India Ltd. in respect of registration and running the Industry. The copy of the Factory license which is valid upto 31<sup>st</sup> December, 2026 is filed herewith as **ANNEXURE-1**.



4. I, say that the company is engaged in the manufacturing of commercial explosives and initiating devices used for mining purposes and high energy materials products for supplies to the defence organisations (Government of India) and exports.
5. I, say that the company had obtained Industrial Licences from competent authorities. The licences for manufacturing of various Explosives of Class 2, 3, and 6; Possess for use of explosives and possess for sale of explosives of Class 2, 3, and 6 in a magazine have been obtained from office of the Chief Controller of Explosives, Petroleum & Explosives Safety Organization (PESO) Nagpur in accordance to the Explosives Rules, 2008.
6. I say that looking at the major developments taking place in defence segment in the form of liberalized Defence Procurement Policy of Ministry of Defence, Govt. of India, based on the policy of "Make in Indian" and "Buy & Make Indian", the company manufactures defence products used by Indian Armed Forces (Indian Army, Indian Air Force & Indian Navy) and contributing for National Security.
7. I say that the company is the first Company in the private sector in India to set up a state-of-the-art technology-based plant to manufacture high energy materials such as HMX & RDX and its compounded products for Defence sector.
8. I say that HMX and RDX compounded products manufactured by the company are being supplied to defence organisation an undertaking of Government of India i.e. Defence Research and



Development Organisation (DRDO), Terminal Ballistic Research Laboratory (TBRL), Advance Centre for Energetic Materials (ACEM), Bharat Dynamics Limited, (BDL), High Energy Materials Research Laboratory (HEMRL) and Ordnance Factory, Khamaria (OFK), and Indian Army.

9. I say that necessary permission was granted to the company for manufacturing HMX/ HMX compounded products RDX/RDX compounded products -Defence by PESO, Nagpur vide licence No. E/HQ/MH/20/98(E113453), dated 30.03.2022 valid up to 31.03.2027. The copy of License issued by PESO, Nagpur, is filed herewith as **Annexure no. 2**. I further say that the above-mentioned licence covers manufacturing facilities as follows:

Sr. No.	Building No.	Building /Shed Name
(i)	PP-6	HMX/HMX compounded & RDX/RDX compounded products manufacturing Plant
(ii)	PD-1	PETN/HMX/RDX/OCTOL/OKFOL/OMA Drying Building
(iii)	L	Laboratory for Testing HMX/RDX
(iv)	HR-CPCH	HMX/ RDX Compounded Product Pellet Casting House
(v)	HR-CPCH 2*	HMX/RDX Compounded Product Pellet Casting House-2

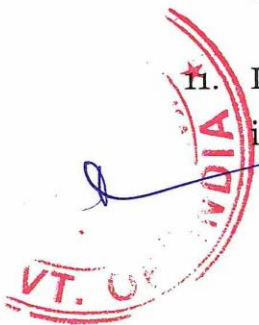
\*The accident had taken place in building No. HR-CPCH-2 on 17.12.2023.



10. I say that the company had obtained Environment Clearance (EC) and Consent to Establish (CTE), and Consent to Operate (CTO) under Section 25 of the Water (Prevention & Control of Pollution) Act, 1974 and under Section 21 of the Air (Prevention & Control of Pollution) Act, 1981 and Authorization under Rule 6 of Rule 18(7) of Hazardous Wastes (Management & Transboundary Movement) Rule 2016 for its manufacturing purpose. The details of which are as under: -

- A) The existing plant of the company has already obtained Environmental Clearance vide File No. J-11011/28/2017-IA II (I) dated 07.06.2019 from MoEF & CC, New Delhi for modernization and expansion of explosives and defence products. The copy of Environmental Clearance is filed herewith as **Annexure no. 3.**
- B) I say that in view of above, 1<sup>st</sup> grant of Consent to Operate with Amalgamation of existing consent was granted by MPCB vide Format 1.0 CAC-Cell/UAN No. 0000071891/O&A/18<sup>th</sup>/CAC-2001001969 dated 20.01.2020 for the validity period up to 30.06.2021. The copy of same is filed herewith as **Annexure no. 4.**
- C) I say that the company had obtained further Renewal of Consent to Operate, by the MPCB vide Format 1.0 CAC/UAN No.0000119394/CR-2201001112 dated 25.01.2022 and valid up to 30.06.2026. A copy thereof is filed herewith as **Annexure no. 5.**

11. I say that the company conducts External Safety Audit periodically in accordance with provision of Section 7 of the Factories Act, 1948



and as per Maharashtra Factories Audit Rules, 2014. I, say that the company had appointed M.D. Safety Consultants Private Limited, Nagpur for carrying out safety audit as per IS:14489-2018 and the same was carried out during October' 2021. The copy of same is filed herewith as **Annexure no. 6**. I, further say that the company had again appointed M.D. Safety Consultants Private Limited, Nagpur for carrying out further External Safety Audit vide Work Order No. 4500446808 dated 20.10.2023. The copy of the work order is filed herewith as **Annexure no. 7**. The team of auditors had visited company on 25.11.2024 & 27.11.2023 for preliminary audit however, safety audit couldn't be completed within time schedule due to unavoidable circumstances at the end of Consultant's and same was rescheduled on 15.12.2023 at the Online portal of Directorate of Industrial Safety & Health. The copy of same is filed herewith as **Annexure no. 8**. I say that, Safety Audit was not conducted due to accident occurred at the HR-CPCH-2 building on 17.12.2023 and suspension of licences by PESO w.e.f. 20.12.2023.

12. I, further say the company is committed to provide a safe and healthy working environment and achieving an injury and illness-free workplace. The company has Health, Safety and Environmental (HSE) Policy, HSE Committee and sub-committee and allocation of Safety budget. The company assess risks and provide controls for safety and health hazards in all the operational activities and conducts audits to check compliance through Safety Inspections. The company imparts periodic Safety education and Training, Evaluation of participants and retraining programmes, motivational and safety promotional programmes viz. Celebration of National



Safety Day/Week, Fire Safety Day, World Environment Day etc. and various competitions programmes organised to its employees. I further say that the company maintains first aid boxes for its employees and provides good working condition, natural ventilation at the working place to its employees. In the factory area, the areas in which hazardous activities are carried out, the same are specifically identified. I further say that there are safe operating procedures (SOP), work permit systems, Hazard identification and Risk Assessment (HIRA), Material safety Data Sheet (MSDS), waste disposal systems, personnel protecting equipment, fire protections, emergency preparedness plan. Hazardous area classification is done and equipment to generate/accumulate static charge/ electricity, pressure vessels (fired and unfired) duly connected with earthing system.

13. I further say that the company had its material storage facility, tank storage area, gas cylinder storage area, transportation facility, pathways, and road facility etc. which are specifically identified in the factory area. All the above facilities have been inspected by the Safety Auditors and all the area are duly sanctioned by the PESO authorities. I further say that adequate safety facilities and arrangements have already been provided in the entire factory area. I say that in all the manufacturing buildings and explosives storage facilities the light fittings are flame proof/dust proof type as approved by Chief Controller of Explosives and of installation lightning conductors on the roof of buildings. The earthing pits for dissipation of electrical, instrumentation and static charge have been provided. I further say that Body Static Discharge Plates are installed



at the entrance door of the manufacturing and storage buildings. Checking of Earthing grounding is carried out by measurement of Resistance /Lightning conductors (ER/LC) system is carried out twice in a year. I further say that conductive flooring provided in the process buildings wherever required, conductive rubber sheeting provided on the working tables in static prone zone of the process buildings, work instructions, Do's & Don'ts in respect of safety precautions are mentioned and employees are required to follow the same. I further say that adequate number of fire extinguishers and deluge system have been installed in the buildings for safety purpose. I further say that two emergency stop switches installed outside the manufacturing buildings. I, say that the Company provides Cotton cloth, conductive shoes to the workmen to prevent generation of static charge during work, and adequate personnel protective equipment (PPE) are being provided to the employees to protect themselves in case any un-eventuality. The photographs showing all the safety precautions are filed herewith as **Annexure No. 9.**

From the above narration of facts, it is most respectfully submitted that the Company had undertaken all precautionary steps and are further in process of enhancing safety measures if any as would be suggested by PESO.

14. I further say that the company is committed to prioritise environmental sustainability and constantly focusing on efforts to reduce greenhouse gases emissions, conserve energy, water and minimise wastes. I, further say that manufacturing facility/ of



company is surrounded by green belt and more than 50,000 trees have been planted. I, say that the Company had been granted Environmental Management System (ISO 14001:2015), Occupational Health & Safety Management (ISO 45001:2018) and Quality Management System (ISO 9001:2015) certificates. The copies of same are attached herewith as **Annexure no. 10 to 12.**

15. I, say that the Company is also contributing for social cause under Corporate Social Responsibility (CSR) under the various heads and Rs. 8.44 crores had been spent / contributed in last financial year i.e. 2023-2024. The details are shown in the chart, which is appended as **Annexure no. 13.**
16. I further say that officer from Maharashtra Pollution Control Board Nagpur had carried out inspection on 5/10/2023 in which it did not found any lapses on account of any mishandling and/or discharge of any hazardous material. The copy of the visit report is filed herewith as **Annexure No. 14.**
17. Thus, from the above it can be revealed that the company has complied with and is complying all the rules and regulations and working within the framework and four corners of rules and regulations and governing its activities.
18. I say that the company is situated at village Chakdoh (Near Bazargaon) Tahsil Katol, district Nagpur – 440023 (Maharashtra) The company owns land of 217.60 Hectare (537.7 acres), out of which manufacturing buildings, storage and other building construction has been carried out in 15.6 acres. Approx. 522.3 acres



open land is available for plantation. About 10-meters periphery of the factory land has been covered with green belt.

19. I further say that nearest village is Bazargaon located at the distance of 3.5 km East from the company at the Nagpur- Amravati Highway no. 53. According to census in year 2011 there are 784 households and 3233 people are living in this village.
20. I say that the company is having more than approx. 100 buildings for manufacturing and storage in the entire factory area, in which building HR-CPCH-2 (HMX/RDX Compounded Product Casting House-2) was licensed for the manufacturing of HMX/RDX compounded products - Defence. I say that the building are constructed as per PESO rules. The above-mentioned building involved in the incident was admeasuring 12.35- meter length x 8.35- meter width and 3.78- meter height. I further say that the construction of walls of buildings was made up of cement brick wall 22.5 centimetres thick and 15 centimetres RCC Roof. The process building was surrounded by vertical inner face transverse (VIFT) all round. The VIFT protection was 2.25-meters in height and 5.8 meters in width at the bottom and 1.5 meters at the top of the soil mound from all the sides. A walkway of 1.5-meters width was available around the process building. A utility shed of dimension (Lx W x H) 6.0 x 4.0 x 3.7 meters was constructed outside the mound at the distance of 3.0 meters towards West side of process building. I further say that all safety equipment were installed in the above building. The above building was inspected by the PESO officers and building drawing was duly sanctioned by PESO and site plan for carrying out its manufacturing was also approved by PESO.



21. I, say that on 17.12.2023, total 9 persons were inside the HR-CPCH-Building No. 2 and were engaged in Tri Nitrotoluene (TNT) Inspection/Sieving and Packing activity. The said activity was being performed in accordance to Work Instruction -ISP/8/PRD/10 Rev. 03 dated 06.09.2023. The Copy of same is filed herewith as **Annexure no. 15.** I, say that during Inspection/Sieving and Packing process an explosion/ incident had occurred in HR-CPCH-2 building which was collapsed resulting in all the 9 employees working inside the building lost their lives unfortunately. I, say that no process activity was being done on the day of incident in the other buildings in the vicinity of the incident site. In the blast, no crater was formed which indicates minimum quantity of TNT was involved in the explosion.
22. I, say that immediately information of the incident was given telephonically/e-mail to the Police Station, Kondhali, Nagpur, Superintend of Police (Rural) Nagpur, Chief Controller of Explosives, Petroleum & Explosives Safety Organisation (PESO) Nagpur, Dy. Chief Controller of Explosives, National Academy of Petroleum & Explosives Safety & Testing Station (NEPES & TS), Gondkhairy, Nagpur, Additional Director Industrial Safety & Health (DISH), Nagpur, District Magistrate, Nagpur , and Regional Officer, Maharashtra Pollution Control Board, (MPCB) Nagpur.
23. I, further say that the rescue operations were carried out by Safety & Security personals of the company according to "Onsite Emergency Plan" with the help of Bomb disposal & Dog Squad (BDDS) and State Defence Reserve Force (SDRF), Rural Police, Nagpur under supervision of PESO officers and other regulatory authorities.



24. I say that, in the unfortunate incident, total 9 employees passed away, the details of the deceased person are as under:

Sr. No.	Name of Workers	Sex	Age in years
1	Yuvraj Kisanji Charode	Male	31
2	Omeshwar Kishanlal Machhirke	Male	25
3	Mosam Rajkumar Patle	Male	23
4	Mita Pramod Uikey	Female	27
5	Aarti Neelkanth Sahare	Female	20
6	Swetali Damodar Marbate	Female	22
7	Pushpa Shriramji Manapure	Female	37
8	Bhagyashri Sudhakar Lonare	Female	23
9	Rumita Vilas Uikey	Female	31

25. I, say that immediately after this unfortunate incident, the company has declared compensation (Ex-gratia) amount of Rs. 20 Lakhs (Rs. Twenty Lakhs only) to legal heirs of each deceased person and the payment has already been done through account payee cheques. I, say that the company had also offered job to the legal heirs/dependents of deceased.
26. I, say that in addition to above compensation the legal heirs, are entitled for compensation under Workmen Compensation Act, Family Pension from Provident Fund & Employees State Insurance Fund and the same are under process. The details of which are as under: -



SOLAR INDUSTRIES INDIA LIMITED																
Village - Chakdoh (Near Bazargaon), Tehsil- Katol, Dist. Nagpur - 440023 (Maharashtra State)																
Details of Deceased Persons in the Accident in the HR-CPCH2 Building on 17.12.2023 & Benefits																
Details of Employer (Deceased Persons), Age and Salary								Details of Benefits to the Nominees of the Deceased Persons								
Sr. No.	Employees Code No.	Name of Deceased Employee	Age (Years)	Gender	Date of Joining	Designation	Salary / Wages (Rs. Per Month)	Ex - gratia Amount Rs.	Cheque No & Date of Issue	Pension - From ESIC		Pension PF		Pension EDLI		Deceased Employee Childrens Education Expenses up to 10th Standard
										Per day Rs.	Per Month Rs	Pension From PF Deptt.	From PF EDLI	Gratuity Rs.		
1	10734	Yunraj Kishraj Chavde	44	Male	02-05-2011	Operator	18898.00	20,00,000.00	727126 Dt 19.12.2023	962.00	28860.00	Under Process	Under Process	366065.00	Two Childrens	
2	75063	Omeshwar Kisanlal Muchhike	32	Male	08-11-2016	Operator	15473.00	20,00,000.00	727127 Dt 19.12.2023	719.00	21570.00	Under Process	423857.00	269660.00	One Children	
3	75869	Mita Pramod Ulkey	30	Female	15-02-2021	Helper	11200.00	20,00,000.00	727137 Dt 20.12.2023	Process	Process	Under Process	Under Process	213231.00	One Children	
4	541570	Aarati Nikantha Sahaie	24	Female	11-02-2013	Operator	12905.00	20,00,000.00	727129 Dt 19.12.2023	167.20	4716.00	Under Process	Under Process	279969.00	NA	
5	541865	Sweetali Damodhar Marbate	25	Female	14-09-2020	Operator	13112.00	20,00,000.00	727130 Dt 19.12.2023	146.40	4392.00	Under Process	361054.00	256768.00	NA	
6	541867	Pushpa Shreeramj Manpure	40	Female	14-09-2020	Operator	13112.00	20,00,000.00	727136 & 727139 Dt 20.12.2023	374.40	11232.00	Under Process	Under Process	149746.00	One Children	
7	551763	Bhagyashri Sudhakar Lonare	26	Female	19-02-2021	Operator	12360.00	20,00,000.00	727132 Dt 19.12.2023	134.70	4041.00	Under Process	348454.00	249577.00	NA	
8	541680	Runita Vilas Ulkey	35	Female	05-09-2019	Operator	13805.00	20,00,000.00	727133 Dt 19.12.2023	404.80	12144.00	Under Process	Under Process	192531.00	Two Childrens	
9	12434	Mosam Rajkumar Patle	23	Male	07-08-2023	Supervisor	22000.00	20,00,000.00	727134 Dt 19.12.2023	Paid Rs. 16,49,626.00 Under WC Act		Under Process	Under Process	500000.00	NA	

27. I, say that Dy. Chief Controller of Explosives, Petroleum and Explosives Safety Organisation (PESO), National Academy of Petroleum and Explosives Safety & Testing Station (NAPES & TS) Gondkhairy, Nagpur, visited incident site and issued Show Cause for Suspension of the manufacturing activities covered under licence vide letter No. E/HQ/MH/20/98(E113453) dated 20.12.2023 and TNT manufacturing licence vide letter no. E/HQ/MH/20/90 (E 89848) dated 20.12.2023. The copy of show cause notice is filed herewith as **Annexure Nos. 16 & 17** for the kind perusal of this Hon'ble Tribunal. I, further say that the company had submitted its reply to PESO on 30.01.2024 with Buildings Stability Certificate for



other process buildings (excluding incident building HR-CPCH-2). The copy of reply is filed herewith as **Annexure No. 18** for kind perusal of the Hon'ble Tribunal. I say that the competent officers of the PESO, Nagpur have visited the site and found the premises fit for operation and recommended to revoke the suspension order and accordingly Chief Controller of Explosive, PESO, Nagpur, had revoked the suspension order no. E/HQ/MH/20/98(E113453) 20.12.2023 & E/HQ/MH/20/90 (E 89848) dated 20.12.2023 vide its letter No. E/HQ/MH/20/98(E113453) dated 13.2.2024 and E/HQ/MH/20/90 (E 89848) dated 13.2.2024 respectively. The copy of same are filed herewith as **Annexure no. 19 & 20**, for kind perusal of this Hon'ble Tribunal.

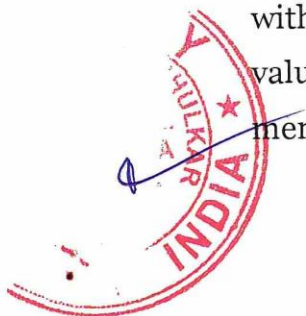
28. I say that, after revocation of the suspension order dated 20/12/2023 by the Petroleum & Explosives Safety Organization (PESO) Nagpur, External Safety Audit was done by MD Safety Consultants Pvt. Ltd. and the same was completed on 20.02.2024. The copy of same is filed herewith as **Annexure no. 21**.
29. I say that no damage was caused to the nearby buildings and equipment's situated in the vicinity of incident site i.e. Building HR-CPCH-2. However, doors and windows found disconnected from the hinges and window glasses got cracked in some of the buildings (viz. HR-CPCH, TNT/ PETN/ HMX/OCTOL/OMA/ OKFOL/ STORE (TPHOS), PETN DRYING (PD-1), PD-2 and PD-6 buildings). I say that the doors and windows were replaced with new one and site inspection of above said buildings was carried out by the officer of NAPES & TS, PESO and after satisfying the requirement permission



came to be granted online at the PESO portal to resume the process activity. I further say that, the photographs of the incident site and so also its surrounding area are being filed herewith, from which it can be reveal that, there was no damage cause to the surrounding area of the incident site. The copy of the photographs are collectively filed as **Annexure No.22**.

30. I say that in view of the assessing effect of the explosion in the surrounding buildings, the stability of the manufacturing buildings/stores situated in the 100 meters surrounding in the factory premises was carried out by the Chartered Civil Engineer, DUSON Civil Engineering Services LLP. I, further say that these buildings and various parts including foundation with special reference to machinery has been examined and confirmed that there is no effect of explosion on the other manufacturing plants/unit, equipment's, storage area, storage tanks, utilities and pipelines covered under the manufacturing licence. The copy of stability certificate of respective buildings already submitted to PESO. The copy of same is filed herewith as **Annexure no. 23**, for kind perusal of this Hon'ble Tribunal.

31. I further say that Regional Officer, Maharashtra Pollution Control Board, had visited the incident site on the day of incident itself and Ambient Air Quality (AAQ) monitoring was carried out at two locations for 24 hours in the plant premises and results revealed that Oxides of Sulphur (SO<sub>2</sub>) and Oxides of Nitrogen (NO<sub>x</sub>) were well within the permissible limits. However Particulate Matter PM<sub>10</sub> values were found exceeding. In this regard, it would be pertinent to mention that during explosion, dust particles of the building and soil



of the mounds would have been dispersed in the air environment and further excavation activity was performed for removal of debris of the incident building, which could be the reason of the exceedance of Particulate Matter PM10. I say that MPCB board vide letter no. MPCB/CD/1323/2023 dated 17.12.2023, issued direction to close the incident site. The copy of the same is filed herewith as **Annexure No. 24**. I, further say that the company had submitted its reply to MPCB vide letter no. MPCB/the company/2023-24/03 dated 30.12.2023. The copy of same is filed herewith as **Annexure no. 25**. I further say that on 7/3/2024, officers of Maharashtra Pollution Control Board visited the incident site and prepared a "Verification Report", pursuant to the order passed by this Hon'ble Tribunal, to calculate the damage caused to the environment due to accident and accordingly, copy of report was provided to the company. It was observed in the said report that Environmental Damage Compensation (EDC) Rs. 37,500/- is required to be paid by the company. The copy of verification report is filed herewith **Annexure No.26** for kind perusal of the Hon'ble Tribunal.

32. I further say that Ambient Air Quality Monitoring Station at the upwind and downwind directions have been installed at the factory premises is operational and manual readings observations are being recorded. I say that there had been cyber-attack at Economic Explosives Limited (EEL)-which is group company of the Solar group located at Village Sawanga Dist. Nagpur and due to which software system of the company was hampered, and MPCB/CPCB server connectivity was disrupted. Now all the systems have been updated and upgraded and same will be connected to the server of



MPCB/CPCB.

33. I further say that, in the above unfortunate incident, collection of contaminated soil and solid waste quantity approx. 1832.9 kgs. was carried out under the guidance of PESO. This soil and solid waste were de-contaminated in scientific manner to make it free from explosive by way of water washing, drying and incineration method. The final decontaminated waste quantity 1240.0 Kgs obtained and same was disposed of on 26/2/2024 with M/s. Maharashtra Enviro Power Limited, Butibori CHW-1 Nagpur. The copy of the Manifest receipt for delivering the contaminated solid waste 1240 kg. is filed herewith as **Annexure No. 27**. The disposal of the decontaminated waste was done in accordance with the provisions of Hazardous and Other Waste Management & Handling Rules (HOWMH) Rules, 2016. I further say that the company had informed to the Regional Officer, Maharashtra Pollution Control Board on 9/3/2024 in respect of treatment and disposal of waste collected from accident site. A copy of which is filed herewith as **Annexure No. 28**.
34. I further say that there was no mishandling of the TNT and the incident occurred accidentally. Further, there is no impact on the soil/land nor there was any illegal dumping of hazardous waste on the open land, nor there was discharge of liquid waste on the open land, nor there was breach in respect of landfill, wherein the waste might either get spilled over the open area on the adjoining land, nor there was any spills/ leaks of the waste due to transportation, leakages from trucks, tanks, pipelines or any other fixed or mobile storage containers. I further say that there was no contamination of



ground water. I further say that there was no impact on surface water nor there are any allegations pertaining to any alleged illegal disposal or improper handling of the waste. I further say that there was no impact on human health. I further say that there was no impact on species, populations, or endangered ecological communities nor there was impact on the crops or any public building or private property.

35. I, further say that the company had conducted Internal Investigation of the Incident through its technical team. It is necessary to mention that Trinitrotoluene (TNT) was stated to be poor brisance property due to very low sensitivity. The outstanding advantage of TNT is that its low sensitiveness to impact and friction, safe handling considerable safety in storage (because of low reactivity of the compounds), relative safety in manufacture and relatively high explosives powder, have made TNT the widely used of all the explosives. As an explosive, TNT is used both compressed (in demolition charge) and the cast form in shells and in demolition charges. TNT is smokeless explosive, pose detonation generation of black smoke is not possible and only fumes are generated. Literature reveals that TNT is a “Docile” explosive which is considered insensitive to impact and friction and requires threshold stimulus to initiate explosion. The minimum ignition energy (MIE) of TNT is 75 (milli Joule (mJ)). Though, TNT dust mixed with air may explode even at low MIE up to 12 mJ with an energy several times higher than the equivalent mass of TNT. The dust is susceptible to rapid combustion if the particles are less than 300 micrometres ( $\mu\text{m}$ ). In the diameter and for organic dust a detonative combustion is



possible in real industrial conditions. Dust may be ignited in many ways such as by electrical or mechanical sparks, hot elements, and external radiations. (*Reference: Dust Explosion – Pioter Wolanski, Warsaw University of Technology, Institute of Heat Engineering*). TNT is used to desensitize other molecular explosives like Pentaerythritol tetranitrate (PETN), HMX & RDX.

36. I say that no firm cause of explosion could be ascertained yet, due to which the entire building No. HR-CPCH-2 collapsed in its entirety. I say that incident might have happened owing to “**dust explosion occurred due to sudden discharge of accumulated static charge**”. The static charge might have developed due to body static current by the person working in the plant, and or due to wearing woollen inner wear during operation. At the relevant time of incident, it was winter season. I say that there is possibility of rapid charging and discharging of accumulated static charge might have developed spark and exploded the TNT dust particles accompanied by the fire which could have burnt the other TNT available in the building. I say that there might have been possibility that moving charged TNT dust particles that were being collected through the dust extraction pipe might have caused the initiation of the TNT dust accumulated in the pipe triggering an explosion.
37. I further say that, after the aforesaid unfortunate incident, the company had taken preventive measures to avert generation of static charge and to avoid any such incident in future. The precautionary steps were taken are as following:



- i). Manual operation for TNT sieving has been stopped with immediate effect.
- ii). Automatic TNT Screening facility provided at the TNT manufacturing plant itself to avoid manual involvement of workers. The Photograph of the same is filed herewith as **Annexure No. 29.**
- iii). The plate type body static charge dissipation plate replaced by an improved version of “Human Body Static Discharge Device” (Model Lamp Unit) and installed at the manufacturing building for dissipation of static charge. On touching the handles with both hands, the lamp will turn from RED colour to GREEN colour after complete discharge of body static charge. The Photograph of the same is annexed herewith as **Annexure No. 30.**
- iv) Conductive hand straps provided to the worker working in the energetic materials to dissipate the static charge continuously.
- v) All process plants have been audited by internal cross functional teams.
- vi) External expert from explosives field was engaged to audit manufacturing plants like TNT, PETN, PETN Drying, Cast Booster, and Detonating Cord etc.
- vii) External Process Safety Management (PSM) expert engaged to enhance Process Safety, Mechanical Integrity, Skill improvement,



Competency mapping and assessment of Risk Matrix in the explosives manufacturing plants.

- viii) Standard Operating Procedures (SOP's) of all the processes are reviewed thoroughly. More focus will be on process automation to avoid manual work.
  - ix) A review has been conducted for the Hazard Identification and Risk Assessment (HIRA) of all the manufacturing processes.
  - x). More focus is being given to behavioural safety and extensive training for the employees. Training programs are undertaken for the employees by the experts in the field of explosives.
38. I further say that, about the Mitigation Plan, all efforts will be initiated to prevent recurrence of such incident. I further say that the suggestions given by the Govt. authorities will be followed in the letter and spirit.

Place : Nagpur

Dated : 20/06/2024

Sr. General Manager (HR & Admin.)

Solar Industries India Limited

**Deponent**



**SOLEMN AFFIRAMTION**

I, Manoj Kumar Singh S/o. Shri Ram Bachan Singh, age about 59 years. R/o. Plot no. 15 Darshana Society, Borgaon, Nagpur – 440013, Sr. General Manager (HR and Admin.) in Solar Industries India Limited, do hereby take oath and state on solemn affirmation that the contents of the above para nos. 1 to 37 are true and correct to my personal knowledge and belief and the same are also verified from the records of the company. I have read and understood the same. Hence, verified, signed and affirmed on this 20<sup>th</sup> day of June, 2024, at Nagpur.

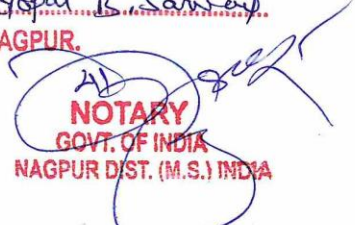
  
Deponent

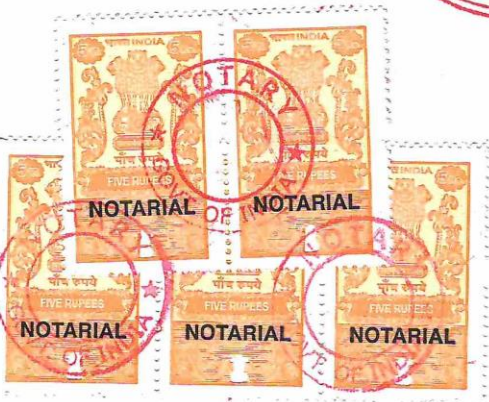
I know and identify the deponent

  
(Gopal B. Samra)  
Advocate



SWORN BEFORE ME ON THIS 20<sup>th</sup> DAY OF June 2024 AT NAGPUR BY SHRI/SMT./KU. Manoj Kumar Singh R/O. Nagpur WHO HAS BEEN IDENTIFIED BY SHRI/SMT. Gopal B. Samra ADVOCATE, NAGPUR.

  
NOTARY  
GOVT. OF INDIA  
NAGPUR DIST. (M.S.) INDIA



**BEFORE THE NATIONAL GREEN TRIBUNAL, WESTERN  
ZONE BENCH, PUNE.**

Original Application no. 28/2024 WZ  
[Earlier Original Application no. 796/2023 (PB)]

**LIST OF ANNEXURES FILED BY RESPONDENT NO. 3/ SOLAR  
INDUSTRIES INDIA LIMITED**

Sr. No.	Description	Date	Page No.
1.	<b><u>ANNEXURE-1</u></b> :- Copy of Factory license which is valid upto 31 <sup>st</sup> December, 2026	18/11/2021	28
2.	<b><u>ANNEXURE-2</u></b> :- Copy of License issued by PESO, Nagpur, vide licence No. E/HQ/MH/20/98 (E113453), valid up to 31.03.2027	30.03.2022	29 - 32
3.	<b><u>ANNEXURE-3</u></b> :- Copy of Environmental Clearance vide File No. J-11011/28/2017-IA II (I) from MoEF & CC, New Delhi	07.06.2019	33 - 39
4.	<b><u>ANNEXURE-4</u></b> :- Copy of 1 <sup>st</sup> grant of Consent to Operate with Amalgamation of existing consent granted by MPCB vide Format 1.0 CAC-Cell/UAN No. 0000071891/O&A/18 <sup>th</sup> /CAC- 2001001969	20.01.2020	40 - 48
5.	<b><u>ANNEXURE-5</u></b> :- Copy of Renewal of Consent to Operate, by the MPCB vide Format 1.0 CAC/UAN No.0000119394/ CR-2201001112	25.01.2022	49 - 58
6.	<b><u>ANNEXURE-6</u></b> :- Copy of company had appointed M.D. Safety Consultants Private Limited, Nagpur for carrying out safety audit as per	27/10/2021	59 - 137

	IS:14489-2018 and the same was carried out during October' 2021		
7.	<b><u>ANNEXURE-7</u></b> :- Copy of company had again appointed M.D. Safety Consultants Private Limited, Nagpur for carrying out further External Safety Audit vide Work Order No. 4500446808	20.10.2023	138 - 139
8.	<b><u>ANNEXURE-8</u></b> :- Copy of The team of auditors had visited company on 25.11.2024 & 27.11.2023 for preliminary audit and same was rescheduled on 15.12.2023 at the Online portal of Directorate of Industrial Safety & Health	15/12/2023	140
9.	<b><u>ANNEXURE-9</u></b> :- Copy of photographs showing all the safety precautions		141 - 145
10.	<b><u>ANNEXURE-10</u></b> :- Copy of Certificate of Environmental Management System (ISO 14001:2015)	21/03/2024	146 - 147
11.	<b><u>ANNEXURE-11</u></b> :- Copy of Certificate of Occupational Health & Safety Management (ISO 45001:2018)	14/03/2022	148
12.	<b><u>ANNEXURE-12</u></b> :- Copy of Certificate of Quality Management System (ISO 9001:2015)	14/03/2022	149
13.	<b><u>ANNEXURE-13</u></b> :- Copy of chart showing the details of Company is contributing for social cause under Corporate Social Responsibility (CSR) under the various heads and Rs. 8.44 crores had been spent / contributed in last financial year i.e. 2023-2024		150
14.	<b><u>ANNEXURE-14</u></b> :- Copy of visit report of Maharashtra Pollution Control Board Nagpur	5/10/2023	151 - 159

15.	<b><u>ANNEXURE-15</u></b> :- Copy of 9 persons were engaged in Tri Nitrotoluene (TNT) Inspection/Sieving and Packing activity performed in accordance to Work Instruction - ISP/8/PRD/10 Rev. 03 dated 06.09.2023	17.12.2023	160 - 161
16.	<b><u>ANNEXURE-16</u></b> :- Copy of Show Cause for Suspension of the manufacturing activities vide letter No. E/HQ/MH/20/98 (E113453) issued by Dy. Chief Controller of Explosives, Petroleum and Explosives Safety Organisation (PESO), National Academy of Petroleum and Explosives Safety & Testing Station (NAPES & TS) Gondkhairy, Nagpur	20.12.2023	162 - 164
17.	<b><u>ANNEXURE-17</u></b> :- Copy of TNT manufacturing licence vide letter no. E/HQ/MH/20/90 (E 89848)	20.12.2023	165 - 166
18.	<b><u>ANNEXURE-18</u></b> :- Copy of reply submitted by company to PESO with Buildings Stability Certificate for other process buildings (excluding incident building HR-CPCH-2).	30.01.2024	167 - 169
19.	<b><u>ANNEXURE-19</u></b> :- Copy of revoke the suspension order no. E/HQ/MH/20/98 (E113453) dated 20.12.2023 vide letter No. E/HQ/MH/20/98 (E113453)	13.2.2024	170 - 171
20.	<b><u>ANNEXURE-20</u></b> :- Copy of revoke the suspension order no. E/HQ/MH/20/90 (E 89848) dated 20.12.2023 vide letter no. E/HQ/MH/20/90 (E 89848)	13.2.2024	172 - 173
21.	<b><u>ANNEXURE-21</u></b> :- Copy of External safety audit done by MD Safety Consultants Pvt. Ltd. completed by	20.02.2024	174 - 291

	the Petroleum & Explosives Safety Organization (PESO) Nagpur		
22.	<b><u>ANNEXURE-22</u></b> :- Copy of photographs of the incident site and so also its surrounding area		292 - 295
23.	<b><u>ANNEXURE-23</u></b> :- Copy of the stability of the manufacturing buildings/stores situated in the 100 meters surrounding in the factory premises was carried out by the Chartered Civil Engineer, DUSON Civil Engineering Services LLP	26/12/2023	296 - 303
24.	<b><u>ANNEXURE-24</u></b> :- Copy of letter no. MPCB/CD/1323/2023 issued by MPCB board and issued direction to close the incident site	17.12.2023	304
25.	<b><u>ANNEXURE-25</u></b> :- Copy of reply submitted by company to MPCB vide letter no. MPCB/the company/2023-24/03	30.12.2023	305 - 306
26.	<b><u>ANNEXURE-26</u></b> :- Copy of verification report issued by officers of Maharashtra Pollution Control Board	7/3/2024	307 - 319
27.	<b><u>ANNEXURE-27</u></b> :- Copy of Manifest receipt for delivering the contaminated solid waste 1240 kg. issued by M/s. Maharashtra Enviro Power Limited, Butibori CHW-1 Nagpur	26/02/2024	320 - 321
28.	<b><u>ANNEXURE-28</u></b> :- Copy of company informed to the Regional Officer, Maharashtra Pollution Control Board in respect of treatment and disposal of waste collected from accident site	9/3/2024	322 - 323

29.	<b><u>ANNEXURE-29</u></b> :- Copy of the photographs showing the Automatic TNT Screening facility provided at the TNT manufacturing plant		324
30.	<b><u>ANNEXURE-30</u></b> :- Copy of the photographs showing On touching the handles with both hands, the lamp will turn from RED colour to GREEN colour after complete discharge of body static charge		325 - 326

Nagpur.

Dated : 20/06/2024



Counsel for Respondent No.3

28

**ANNEX - 1**

महाराष्ट्र शासन

औद्योगिक सुरक्षा व आरोग्य संचालनालय (कामगार विभाग)

परवाना क्र : १०४९२

नमूना क्रमांक ४

(नियम ६ व ८ पाहणे)

कारखान्याची नोंदणी व कारखाना चालविण्याचा संबंधीचा परवाना

नोंदणी क्रमांक : १६४०५००२१७७६१



कारखाने अधिनियम, १९४८ आणि त्यासंबंधी असलेले नियम यांच्या तरतुदीप्रमाणे सोलर इन्डस्ट्रिज इंडिया लीमीटेड यांना खाली वर्णन केलेल्या जागेत कारखाना चालविण्यास परवाना देण्यात आला आहे.

या परवान्यान्वये या जागेत कोणत्याही एका दिवशी ४००० पर्यंत कामगार लावण्यास आणि २००० पेक्षा जास्त अश्वशक्ति उपयोगात आणण्यास परवानगी आहे.

या परवान्याची मुदत ३१ डिसेंबर २०२२ पर्यंत आहे.

Digitally Signed by  
Jayant Moharkar  
Date:11/18/2021 5:34:05 PM

परवान्याचे नूतनीकरण १ जानेवारी २०२३ ते ३१ डिसेंबर २०२६ पर्यंत करण्यात आले आहे.  
शुल्क रु. - १४५००३.६० पाहिलेले

दिनांक : १८-११-२०२१

Signature valid



अपर संचालक  
औद्योगिक सुरक्षा व आरोग्य,  
महाराष्ट्र राज्य, नागपूर

परवाना दिलेल्या जागेचे वर्णन

परवाना दिलेल्या कारखान्याचे

सोलर इन्डस्ट्रिज इंडिया लीमीटेड

Factory Name :

SOLAR INDUSTRIES INDIA LTD

पत्ता :

मेसर्स सोलर इन्डस्ट्रिज इंडिया लीमीटेड, अमरावती

Address :

M/S SOLAR INDUSTRIES INDIA LTD, AMRAWATI  
ROAD, BAJARGAON, CHAKDOH, Katol, Nagpur, MAHARASHTRA, 440023

कलम :

२(m)(i)

औद्योगिक वर्गीकरण :

१६६९६

कारखान्याच्या इमारतीचे नकाशे दिनांक ०६.०८.२०२१ च्या जावक क्रमांक JMM/SAK/४८/२०१६/३१२४/३२ खाली संजूर केले गेले आहेत.

This Certificate is digitally signed by on.

टिप : हा कारखान्याची नोंदणी व कारखाना चालविण्याचा परवाना आहे. हा परवाना देण्यात आल्यामुळे ज्या जागेत हा कारखाना स्थित आहे, त्या जागेस कोणतीही वैधता आपोआप बहाल होत नाही तसेच ज्या जागेत हा कारखाना स्थित आहे ती जागा आज दिनांक वेळेस अस्तित्वात असल्या संबंधात या परवान्यामुळे कोणताही हक्क व स्वामित्व सदरहू भोगवटदारास प्राप्त होत नाही

(29)

ANNEXURE NO.2

भारत सरकार | Government of India  
 वाणिज्य और उद्योग मंत्रालय | Ministry of Commerce & Industry  
 पेट्रोलियम तथा विस्फोटक सुरक्षा संगठन (पेसो) | Petroleum & Explosives Safety Organisation (PESO)  
 पूर्व नाम- विस्फोटक विभाग | Formerly- Department of Explosives  
 विभागीय परीक्षण केन्द्र, 18 कि.मी. स्टेन | Departmental Testing Station, 18 Km Stone,  
 अमरावती रोड गोंडखैरी | Amraoti Road, DTS, Gondkhairi, Nagpur 440023  
 फोन (Phone):- 280374 | फैक्स (Fax):-  
 ई-मेल Email: dyccedts@explosives.gov.in

संख्या (No.): E/HQ/MH/20/98(E113453)

दिनांक (Date): 30/03/2022

सेवा में | To,

M/s. Solar Industries India Limited,  
 Solar House, 14, Kochimeti, Amravati Road, Nagpur, Town/Village - Nagpur  
 District-NAGPUR, State-Maharashtra, Pincode - 440023

विषय: Survey No.75, 78, 79, 81, 82, 83, 39, 40, 71, 38, 1, 3, 8/1, 8/2, 31, 37, 70, 72, 73/1, 73/2, 74 & 85 of Chakdoh and 29/1, 29/2 of Bazargaon, ग्राम Chakdoh & Bazargaon, जिला NAGPUR, राज्य Maharashtra में विस्फोटक के विनिर्माण हेतु विस्फोटक नियम, 2008 के अंतर्गत LE-1 में जारी अनुज्ञप्ति से E/HQ/MH/20/98(E113453) के नवीनीकरण संदर्भ में।  
 Subject: Manufacturing of HMX/HMX Compounded Products - Defence, RDX/RDX Compounded Products - Defence situated at Survey No.:75, 78, 79, 81, 82, 83, 39, 40, 71, 38, 1, 3, 8/1, 8/2, 31, 37, 70, 72, 73/1, 73/2, 74 & 85 of Chakdoh and 29/1, 29/2 of Bazargaon, Chakdoh & Bazargaon, Dist. NAGPUR, Maharashtra -Licence No.: E/HQ/MH/20/98(E113453) granted in Form LE-1 of Explosives Rules, 2008 - Renewal regarding

महोदय | Sir,

आपका उपर्युक्त विषय पर पत्र संख्या 61042 दिनांक 23/03/2022 का संदर्भ ग्रहण करें। विस्फोटक नियम, 2008 के अंतर्गत प्रारूप LE-1 में जारी अनुज्ञप्ति दिनांक 31/3/2027 तक नवीनीकृत कर इस पत्र के साथ भेजी जा रही है।

Reference to your letter No.: 61042 dated: 23/03/2022, the subject licence duly renewed upto 31/3/2027 and issued in Form LE-1 of Explosives Rules, 2008 is forwarded herewith.

अनुज्ञप्ति के आपसी नवीकरण हेतु कृपया निम्नलिखित दस्तावेज दिनांक 31/03/2027 से पहले इस कार्यालय को भेजे जाएं।

For further renewal of licence, please submit the following documents so as to reach this office on or before 31/3/2027.

- प्रारूप आरई-1 में विधिवत पूर्ण एवं हस्ताक्षरित आवेदन।  
Application in Form RE-1 duly filled in and signed.
- एक से पांच वर्ष के अनुज्ञप्ति शुल्को का, विस्फोटक नियम, 2008 के तहत ऑनलाइन आवेदन पोर्टल पर उपलब्ध ई-भुगतान सुविधा के माध्यम से लाइसेंस शुल्क ऑनलाइन जमा किया जाना है।  
Licence fees renewable for one to five years, to be submitted online through e-payment facility available on online application portal under the Explosives Rules, 2008.
- अनुमोदित प्लान के साथ मूल अनुज्ञप्ति।  
Original licence with approved plan.
- कृपया इस संदर्भ में विस्फोटक नियम, 2008 के नियम 112 का भी संदर्भ ग्रहण करें।  
In this connection, please also refer to Rule 112 of Explosives Rules, 2008. आपके द्वारा विनिर्माण किए गए विस्फोटक का रिकार्ड (खाता) विस्फोटक नियम, 2008 के प्रारूप आर.इ.2 और आर.इ.4 में बनाए रखने की सलाह दी जाती है।  
You are advised to maintain accounts of explosives manufactured by you in Form RE-2 and RE-4 of Explosives Rules, 2008.

भवदीय | Your's faithfully

(एच. पी. संगोले) | H P SANGOLE

विस्फोटक नियंत्रक | Controller of Explosives

उप मुख्य विस्फोटक नियंत्रक | Deputy Chief Controller of Explosives

गोंडखैरी | DTS, Gondkhairi, Nagpur

प्रतिलिपि प्रेषित | Copy Forwarded to:

1. जिला मजिस्ट्रेट (District Magistrate), NAGPUR (Maharashtra)- सूचना के लिए (for information.)

उप मुख्य विस्फोटक नियंत्रक | Deputy Chief Controller of Explosives  
 गोंडखैरी | DTS, Gondkhairi, Nagpur

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

**Note :- This is system generated document does not require physical signature. Applicant may take printout for their records.**

30

## अनुज्ञापि प्ररूप एल. ई.-1 | LICENCE FORM LE-1

(विस्फोटक नियम, 2008 की अनुसूची 4 के भाग 1 के अनुच्छेद 1(क) से (छ) देखिए।)  
(See article 1(a) to (g) of Part 1 of Schedule IV of Explosives Rules, 2008)(छ) आतिशबाजी, बारूद, ए.एन.एफ.ओ., एल.ओ.एक्स. और एक्स.एम.ई. से भिन्न विस्फोटक के विनिर्माण के लिए अनुज्ञापि  
Licence to manufacture : (g) Explosives other than Fireworks, Gunpowder, ANFO, LOX and SME.

अनुज्ञापि सं. (Licence No.): E/HQ/MH/20/98(E113453)

वार्षिक फीस रूपए (Annual Fee Rs): 1200/-

1. Licence is hereby granted to

M/s. Solar Industries India Limited (अधिभोगी / Occupier : Shri Milind Deshmukh), Solar House, 14, Kachimet, Amravati Road, Nagpur., Town/Village - Nagpur, District-NAGPUR, State-Maharashtra, Pincode - 440023



को अनुज्ञापि अनुदत्त की जाती है।

2. अनुज्ञापिधारी की प्रास्थिति | Status of licensee : Company

3. अनुज्ञापि निम्नलिखित प्रयोजनों के लिए विधिमाम्य है। Manufacture of -

Licence is valid only for the following purpose. : HMX/HMX Compounded Products - Defence, RDX/RDX Compounded Products - Defence - के विनिर्माण के लिए।

4. अनुज्ञापि विस्फोटकों के निम्नलिखित किस्मों, प्रकार और मात्रा के लिए विधिमाम्य है।

Licence is valid for the following kinds and quantity of explosives: - (क) (a)

क्र Sr. No.	नाम और विवरण Name and Description	वर्ग और प्रभाग Class & Division	उप-प्रभाग Sub-division	मात्रा वार्षिक क्षमता (केवल अनुच्छेद 1 (छ) के अधीन अनुज्ञापि के लिए) Quantity annual capacity (only for licence under article 1(g))
1.	HMX/HMX Compounded Products - Defence	3, 2	0	50 MT
2.	RDX/RDX Compounded Products - Defence	3, 2	0	50 MT

5. निम्नलिखित रेखाचित्र (रेखाचित्रों) से अनुज्ञापि परिसर की पुष्टि होती है।  
The licensed premises shall conform to the following drawing(s):रेखाचित्र क्र. (Drawing No.) E/HQ/MH/20/98(E113453)  
दिनांक (Dated) 29/10/2018

6. अनुज्ञापि परिसर निम्नलिखित पते पर स्थित हैं। The licensed premises are situated at following address:

Survey No. 75, 78, 79, 81, 82, 83, 39, 40, 71, 38, 1, 3, 8/1, 8/2, 31, 37, 70, 72, 73/1, 73/2, 74 &amp; 85 of Chakdoh and 29/1, 29/2 of Bazargaon, ग्राम (Town/Village) : Chakdoh &amp; Bazargaon, पुलिस थाना (Police Station) : Kondhali

जिला (District)	NAGPUR	राज्य (State)	Maharashtra	पिनकोड (Pincode)	440023
दूरभाष (Phone)	07118 277330	ई.मेल (E-Mail)	sdchakdoh@solargroup.com	फैक्स (Fax)	0712 2560202

7. अनुज्ञापि परिसर में निम्नलिखित सुविधाएं अंतर्निहित हैं।  
The licensed premises consist of following facilities.

1 HMX/HMX Compounded &amp; RDX/RDX Compounded products Manufacturing Plant, 1 PETN/HMX/RDX/OCTOL/OKFOL/OMA Drying Building, 1 Laboratory for Testing of HMX/RDX, 1 HMX/RDX Compounded Product Pellet Casting House, 1 HMX/RDX Compounded Product Pellet Casting House 2, with connected facilities.

8. अनुज्ञापि समय - समय पर यथासंशोधित विस्फोटक अधिनियम, 1884 और उनके अधीन विरचित विस्फोटक नियम, 2004 के उपबंधों, शर्तों और अतिरिक्त शर्तों और निम्नलिखित उपाबंधों के अधीन रहते हुए अनुदत्त की जाती है।

The licence is granted subject to the provision of Explosives Act 1884 as amended from time to time and the Explosives Rules, 2008 framed there under and the conditions, additional conditions and the following Annexures.

- उपरोक्त क्रम सं. 5 में यथा कथित रेखाचित्र (स्थान, सन्निर्माण संबंधी और अन्य विवरण दर्शित करते हुए)।  
Drawings (showing site, constructional and other details) as stated in serial No. 5 above.
- अनुज्ञापि प्राधिकारी द्वारा हस्ताक्षरित इस अनुज्ञापि की शर्तों और अतिरिक्त शर्तों।  
Conditions and Additional Conditions of this licence signed by the licensing authority.
- परिशिष्ट | Annexure

9. यह अनुज्ञापि तारीख 31 मार्च 2022 तक विधिमाम्य रहेगी। This licence shall remain valid till 31st day of March 2022.

यह अनुज्ञापि, अधिनियम या उसके अधीन विरचित नियमों या अनुसूची V के भाग 4 के प्रति निर्दिष्ट सेट Set VI के अधीन तथा उपरोक्त इस अनुज्ञापि की शर्तों का अधिकरण करने या यदि अनुज्ञापि परिसर योजना या उससे संलग्न उपबंध में दर्शित विवरण के अनुरूप नहीं पाए जाने पर निलंबित या प्रतिसंहत की जा सकती है, जहां वह लागू हो।  
This licence is liable to be suspended or revoked for any violation of the Act or Rules framed there under or the conditions of this licence as set forth under set Set VI, wherever applicable, referred to in Part 4 of Schedule V or if the licensed premises are not found conforming to the description shown in the plans and Annexure attached hereto.

तारीख | The Date - 29/10/2018

मुख्य विस्फोटक नियंत्रक | Chief Controller of Explosives

## Amendments :

- Amendment of Quantity of Explosives dated : 13/12/2019
- Amendment in Drawings/Facilities/Premises dated : 26/10/2020
- Change in Authorized Signatory/Occupier/Partners/Directors dated : 01/10/2021
- Change in Postal Address dated : 01/10/2021
- Amendment in Drawings/Facilities/Premises dated : 02/12/2021

नवीनीकरण के पृष्ठकन के लिए स्थान  
Space for Endorsement of Renewal

नवीकरण की तारीख Date of Renewal	समाप्ति की तारीख Date of Expiry	अनुज्ञापन प्राधिकारी के हस्ताक्षर और स्टाम्प Signature of licensing authority and stamp
30/03/2022	31/03/2022	उप मुख्य विस्फोटक नियंत्रक, नागपुर Dy. Chief Controller of Explosives, DTS, Gondkhairi, Nagpur

ज्ञान्ती चेतावनी : विस्फोटकों को गलत ढंग से चलाने या उनका दुरुपयोग विधि के अधीन गंभीर दंडिक अपराध होगा।  
Statutory Warning : Mishandling and misuse of explosives shall constitute serious criminal offence under the law.

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(सेट VI | Set VI)

मुख्य विस्फोटक नियंत्रक द्वारा अनुदत्त प्ररूप एल. ई-1 (छ) में आतिशबाजी, बारूद, ए एन एफ ओ, द्रव आक्सीजन विस्फोटक और साइट मिश्रित विस्फोटकों से भिन्न विस्फोटकों के विनिर्माण के लिए अनुज्ञप्ति सं. E/HQ/MH/20/98(E113453) की शर्तें निम्नलिखित हैं।  
The Following are the conditions of licence number E/HQ/MH/20/98(E113453) to manufacture explosives other than fireworks, gunpowder, ANFO, Liquid Oxygen Explosives and Site Mixed Explosives in Form LE-1 [article 1(g)] granted by Chief Controller or Controller of Explosives.

- परिसर या उसके किसी भाग में विस्फोटकों की मात्रा किसी एक समय में उस मात्रा से अधिक नहीं होगी, जिसके लिए अनुज्ञप्ति जारी की गई है।  
The quantity of explosives on the premises or any part thereof shall not exceed at any one time the quantity for which licence has been issued.
- प्रसंस्करण और भंडारण शेड या भवनों में अनुसूची VIII में यथाविनिर्दिष्ट सुरक्षा दूरी बनाई रखी जाएगी।  
The process and storage sheds or buildings shall maintain safety distances as specified in Schedule VIII.
- प्रत्येक भवन या शेड में कार्य कड़ाई से अधिकथित सुरक्षा कार्य प्रक्रियाओं और अनुदेशों के अनुसार किया जाएगा।  
Work in each building or shed shall be carried out strictly in accordance with the laid down safe working procedures and instructions.
- अनुज्ञापिका और कारखाने में या उसके आसपास नियोजित प्रत्येक व्यक्ति कारखाने में अग्नि या विस्फोटक से होनेवाली दुर्घटनाओं को रोकने के लिए सभी सम्यक पूर्ववर्णित कार्य बरतेंगे और इस बाबत पूर्णतः सावधानी बरतेंगे कि अप्राधिकृत व्यक्ति कारखाने या उसमें रखे गए विस्फोटकों तक न पहुंच सकें तथा ऐसा कोई कार्य नहीं करेंगे जिससे आग लगने या विस्फोट होने की संभावना हो और जो कारखाने में कार्य के लिए युक्तियुक्त आवश्यक न हो। उपयुक्त कार्यकरण वस्त्रों, उपयुक्त जूतों आदि के प्रयोग द्वारा इस बाबत सम्यक उपबंध किए जाएंगे जिससे आग लगने या विस्फोट का खतरा न रहे।  
The licensee and every person employed in or about the factory shall take all due precautions for the prevention of accidents by fire or explosion in the factory and for preventing unauthorised person from having access to the factory or to the explosives therein and shall abstain from any act whatsoever which tends to cause fire or explosion and is not reasonably necessary for the purposes of work in the factory. Due provisions shall be made, by the use of suitable working clothes, suitable shoes etc as not to cause any danger of fire or explosion.
- अनुज्ञापन प्राधिकारी की लिखित में पूर्व मंजूरी के बिना अनुज्ञाप परिसर में कोई परिवर्तन और परिवर्धन नहीं किया जाएगा। ऐसे मंजूरी किए गए परिवर्धन और परिवर्तन को अनुज्ञप्ति से संबंधित संशोधित रेखांक में दर्शाया जाएगा।  
No additions and alterations shall be carried out in the licensed premises without a previous sanction in writing of the licensing authority. Such additions and alterations so sanctioned shall be shown in the amended plan attached to the licence.
- उन भवनों के, जिनमें विस्फोटकों का विनिर्माण या धराई-उठाई की जाती है, कंपार्टमेंटों के भीतर और उनमें लगी मशीनरी या फिटिंग की, दिन का कार्य समाप्त हो जाने के पश्चात सावधानीपूर्वक सफाई की जाएगी। उन भवनों के, जिसमें विस्फोटकों का विनिर्माण या धराई-उठाई की जाती है, कंपार्टमेंटों से निकाल कूड़ा सावधानीपूर्वक इकट्ठी किया जाएगा और अधिकथित प्रक्रिया के अनुसार उसका निपटारा उचित उपचार करने के पश्चात ही किया जाएगा।  
The interior of the compartments of the building in which explosives are manufactured or handled and the machinery or fittings therein shall be thoroughly cleaned at the end of day's work. Sweepings from the compartments of the building in which explosives are manufactured or handled shall be carefully collected and disposed as per laid down procedure. The effluent shall be discharged only after proper treatment as per laid down procedure.
- अनुज्ञापिका विस्फोटकों के विनिर्माण और अन्य प्रक्रियाओं और विनियमों के अनुसार संक्रियाओं के संचालन का पर्यवेक्षण करने के लिए किसी अर्ह और सक्षम व्यक्ति की नियुक्ति करेगा।  
The licensee shall appoint a qualified and competent person to supervise the manufacture of explosives and other process and to conduct the operations in accordance with these rules.
- अनुज्ञापिका, अभिभोगी, सुरक्षा अधिकारी और अर्ह और सक्षम व्यक्ति सुरक्षा जागरूकता के लिए और अपनी स्वधर्म के तथा अपने अधीनस्थों के ज्ञान के लिए नियमित रूप से सुरक्षा कार्यशालाओं प्रशिक्षण कार्यक्रमों में भाग लेंगे तथा उनका आयोजन भी करेंगे और उसे लेखबद्ध करेंगे।  
The licensee, occupier, the safety officer and the qualified and competent persons shall undergo and also organise safety workshops and training programmes regularly for safety awareness and for knowledge for their own as well as their sub-ordinates and shall record the same.
- सभी कर्मचारी (पूर्णकालिक, अंशकालिक या संविदा पर आधारित) कारखाने के आपदा प्रबंधन के लिए आपदा प्रतिक्रिया योजना से अवगत होंगे।  
All employees (full time, part time or contract basis) shall be conversant with the emergency response plan for disaster management of the factory.
- सभी अशुभ घटनाओं (जिसके अंतर्गत छोटी घटनाएं भी हैं) की (अधिमानतः आसन्न चूकों और संकटपूर्ण परिस्थितियों को भी बताते हुए) अभिलिखित किया जाएगा और उनका अनुज्ञापिका तथा सक्षम व्यक्ति द्वारा सभी व्यक्तियों के लिए प्राप्त जानकारी के प्रसार की शैक्षिक प्रक्रिया के रूप में परिसर में कार्य करने वालों को समग्र-समग्र पर पुनर्वितरण किया जाएगा।  
All unsafe incidents (including the minor one) shall be recorded (preferably stating the near-misses and also critical situations) and shall be reviewed periodically by the licensee and the competent person as a learning process disseminate the lesson(s) learnt, to all the people working in the premises.
- किसी निरीक्षण या नमूना लेने वाले अधिकारी को सभी युक्तियुक्त समयों पर अनुज्ञाप परिसर में अबाध पहुंच प्रदान की जाएगी और यह अभिलिखित करने के लिए कि अधिनियम और इन नियमों के उपबंधों तथा सुरक्षा संबंधी शर्तों का सम्यक रूप से पालन किया जाता है, उस अधिकारी को प्रत्येक सुविधा उपलब्ध करवाई जाएगी।  
Free access to the licensed premises shall be given at all reasonable times to any inspecting or sampling officer and all facilities shall be offered to the officer for ascertaining that the provisions of the Act and these rules and the safety conditions are duly observed.
- यदि अनुज्ञापन प्राधिकारी या विस्फोटक नियंत्रक लिखित में अनुज्ञापिका को अनुज्ञाप परिसर या मशीनरी, औजारों या साधनों में कोई परिवर्धन या परिवर्तन करने के लिए जो ऐसे प्राधिकारी की राय में अस्वीकार्य जोखिम प्रदर्शित कर सकती है और परिसर या व्यक्तियों की स्थल पर या स्थल से बाहर सुरक्षा के लिए आवश्यक है, एवं उपरोक्त के बारे में सूचित करता है तो अनुज्ञापिका सिफारिशों को निष्पादित करेगा और ऐसे प्राधिकारी द्वारा विनिर्दिष्ट अवधि के भीतर अनुपालन की रिपोर्ट देगा।  
If the licensing authority or the Controller of Explosives informs in writing, the holder of the licence to execute any repairs or to make any additions or alterations to the licensed premises or machinery, tools or apparatus or carry out recommendations, which are in the opinion of such authority may pose unacceptable risk and therefore the same is necessary for the safety of either on-site or off-site of the premises or persons, the holder of the licence shall execute the recommendations and report compliance within the period specified by such authority.
- अग्नि या विस्फोट के कारण होनेवाले दुर्घटनाओं और विस्फोटकों की हानि, कमी या चोरी के बारे में निकटतम पुलिस स्टेशन और अनुज्ञापन प्राधिकारी तथा अनुज्ञापन प्राधिकारी के स्थाननीय कार्यालय में तुरंत रिपोर्ट की जाएगी।  
Accidents by fire or explosion and losses, shortage or theft of explosives shall be immediately reported to the nearest police station and the licensing authority and local office of the licensing authority.

कृते मुख्य विस्फोटक नियंत्रक  
For Chief Controller of Explosives

**Note :- This is system generated document does not require physical signature. Applicant may take printout for their records.**

**Annexure**  
Particulars of Facilities attached with factory  
covered under Licence No.: E/HQ/MH/20/98(E113453)

No.	Shed Name	Shed Room/Marking	No. of Sheds	Breadth (Mtrs.)	Length (Mtrs.)	Quantity per Shed (Kgs.)	Man Limit per Shed	Total Capacity (Kgs.)	Total Man Limit
1	HMX/HMX Compounded & RDX/RDX Compounded products Manufacturing Plant	PP-6	1	6	17	300	9	300	9
2	PETN/HMX/RDX/OCTOL/OKFOL/OMA Drying Building	PD-1	1	13	6	300	4	300	4
3	Laboratory for Testing of HMX/RDX	L	1	11	21	5	16	5	16
4	HMX/RDX Compounded Product Pellet Casting House	HR-CPCH	1	7	10	300	9	300	9
5	HMX/RDX Compounded Product Pellet Casting House 2	HR-CPCH-2	1	8	12	400	11	400	11
								<b>Total Capacity : 1305 Kgs.</b>	
								<b>Total Man Limit : 49</b>	

The Date : 02/12/2021

For Chief Controller of Explosives

**Note :- This is system generated document does not require physical signature.  
Applicant may take printout for their records.**

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ANNEXURE No. 3

F. No.J-11011/28/2017-IA II (I)  
Government of India  
Ministry of Environment, Forest and Climate Change  
IA Division

Indira Paryavaran Bhawan  
Jor Bagh Road, N Delhi - 3  
Dated 7<sup>th</sup> June, 2019

To,

**M/s Solar Industries India Limited**  
Village Chakdoh, Tehsil Katol,  
District **Nagpur** (Maharashtra)

**Sub: Modernization and Expansion of explosives and defence products manufacturing plant by M/s Solar Industries India Limited at Village Chakdoh, Tehsil Katol, District Nagpur (Maharashtra) - Environmental Clearance - reg.**

**Ref: Online proposal No.IA/MH/IND2/61877/2017 dated 22<sup>nd</sup> October, 2018.**

Sir,

This has reference to your online proposal no. IA/MH/IND2/61877/2017 dated 22<sup>nd</sup> October, 2018 for environmental clearance to the above project.

2. The Ministry of Environment, Forest and Climate Change has examined the proposal for grant of environmental clearance to the project for modernization and expansion of explosives and defence products manufacturing plant by M/s Solar Industries India Limited in an area of 1108474.47 sqm located at Village Chakdoh, Tehsil Katol, District Nagpur (Maharashtra).

3. The details of existing and proposed products are as under:

S. No.	Product	Existing Capacity (MTPA)	Proposed Capacity (MTPA)	Total Capacity (MTPA)
1.	Surry /Emulsion Explosives (Nitrate Mixture)	100000	56250	156250
2.	Bulk Emulsion (SME) (Nitrate Mixture)	NIL	125000	125000
3.	Sorbitan Monooleate (SMO) C&F	9162	NIL	9162
4.	Polyisobutylene succinic anhydride, (PIBSA) C & F	6000	NIL	6000
5.	Lead Azide (Captive)	9	Nil	9
6.	Lead Styphanate (Captive)	3	Nil	3
7.	ASA (Mixing and Drying) Captive	12	Nil	12
8.	Penta Erythritol Tetra Nitrate (PETN) C & F	2062.5	937.5	3000

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9.	Cyclotetramethylene tetranitamine, (HMX) & HMX Compounded Products, C & F	62.5	237.5	300
10.	RDX & RDX Compounded Products	125	2875	3000
11.	Trinitrotoluene (TNT)	625	2375	3000
12.	Pentolite Cast Booster	1875	1125	3000
13.	Detonating Fuse	75 Million Meters	75 Million Meters	150 Million Meters

4. Existing land area is 1108474.47 sqm. No additional land shall be required for the proposed expansion. Industry has already developed greenbelt in an area of 33% i.e. 365795.35 sqm out of total project area. The estimated project cost is Rs.184.01 crores. Total capital cost earmarked towards environmental pollution control measures is Rs. 7.0114915 Crores and the recurring cost (O&M) will be about Rs. 3.6168353 crores per annum. Total employment will be 1710 persons as direct & 100 persons indirect after expansion.

5. There are no National Parks, Wildlife Sanctuaries, Biosphere Reserves, Tiger/Elephant Reserves, Wildlife Corridors, Rivers etc within 10 km. Jam River flows at a distance of 18 km in West-North West.

6. Total fresh water requirement is estimated to be 471 cum/day. The required permission for withdrawal of 430 cum/day has been obtained from the Central Ground Water Authority vide their letter dated 15<sup>th</sup> May, 2018. To meet the incremental water demand, proposal has been submitted to the concerned regulatory authority.

Total effluent generated from different industrial operations is estimated to be 259 cum/day, which will be treated in the ETP, and 227 cum/day of treated water will be reused in the process/gardening. There will be no discharge of treated/untreated waste water from the unit, and thus ensuring Zero Liquid Discharge.

Existing unit has 11 TPH (2 TPH, 3 TPH & 6 TPH) coal / agro waste briquette fired boiler and Thermopac boiler of 600000 k Cal/hr capacity. Additionally, 12 TPH coal fired boiler will be installed. Multi cyclone separator/ bag filter with a stack of height of 30 m (existing boilers) and 33.5 m (proposed boilers) will be installed to control the particulate emissions within the statutory limit of 115 mg/Nm<sup>3</sup>.

7. The project/activities are covered under category A of item 5(f) 'Synthetic organic chemicals industry' and category B of item 6(b) 'Isolated storage & handling of hazardous chemicals' of the schedule to the EIA Notification, 2006, and requires appraisal/approval at central level in the Ministry.

8. The ToR for the project was granted on 7<sup>th</sup> July, 2017. Public hearing was conducted by the Maharashtra State Pollution Control Board on 28<sup>th</sup> December 2017.

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9. The proposal was considered by the Expert Appraisal Committee (Industry-2) in its meetings held on 19-20 December, 2018 and 26-28 February, 2019, wherein the project proponent and their accredited consultant presented the EIA/EMP report. The Committee found the EIA/EMP report complying with the ToR and recommended the project for grant of environmental clearance.

10. Based on the proposal submitted by the project proponent and recommendations of the EAC, Ministry of Environment, Forest and Climate Change hereby accords environmental clearance to the project for **modernization and expansion of explosives and defence products manufacturing plant** by M/s Solar Industries India Limited located at Village Chakdoh, Tehsil Katol, District Nagpur (Maharashtra), under the provisions of the EIA Notification, 2006, and the amendments therein, subject to compliance of the terms and conditions as under:-

(a) Necessary permission as mandated under the Water (Prevention and Control of Pollution) Act, 1974 and the Air (Prevention and Control of Pollution) Act, 1981, as applicable from time to time, shall be obtained from the State Pollution Control Board.

(b) Necessary permission from the Ministry of Defence and/or other statutory authorities shall be obtained for manufacturing products of their use.

(c) Storage of different raw materials and/or the finished products shall be as decided by the PESO and the permission granted in this regard.

(d) As already committed by the project proponent, Zero Liquid Discharge shall be ensured and no waste/treated water shall be discharged outside the premises.

(e) Necessary authorization required under the Hazardous and Other Wastes (Management and Trans-Boundary Movement) Rules, 2016 and the Solid Waste Management Rules, 2016 shall be obtained. The provisions contained therein for handling, generation, collection, storage, packaging, transportation, use, treatment, processing, recycling, recovery, pre-processing, utilization, offering for sale, transfer or disposal of hazardous waste, shall be strictly adhered to.

(f) No raw material/solvent prohibited by the concerned regulatory authorities from time to time, shall be used for production of pesticides.

(g) National Emission Standards for Organic Chemicals Manufacturing Industry issued by the Ministry vide G.S.R. 608(E) dated 21<sup>st</sup> July, 2010 and amended from time to time shall be followed.

(h) Coal with Sulphur content less than 0.5% shall be used as fuel in the boiler, along with bio-fuel/briquettes/bagasse/agro waste.

(i) To control source and the fugitive emissions, suitable pollution control devices shall be installed to meet the prescribed norms and/or the NAAQS. The gaseous emissions shall be dispersed through stack of adequate height as per CPCB/SPCB guidelines.

(j) Solvent management shall be carried out as follows:

(i) Reactor shall be connected to chilled brine condenser system.

(ii) Reactor and solvent handling pump shall have mechanical seals to prevent leakages.

(iii) The condensers shall be provided with sufficient HTA and residence time so as to achieve more than 95% recovery.

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- (iv) Solvents shall be stored in a separate space specified with all safety measures.
  - (v) Proper earthing shall be provided in all the electrical equipment wherever solvent handling is done.
  - (vi) Entire plant shall be flame proof. The solvent storage tanks shall be provided with breather valve to prevent losses.
  - (vii) All the solvent storage tanks shall be connected with vent condensers with chilled brine circulation.
- (k) Total fresh water requirement shall not exceed 471 cum/day, out of which 430 cum/day shall be met from ground water, and the remaining from surface water resource. Prior permission in this regard shall be obtained from the concerned regulatory authority/CGWA.
- (l) Process effluent/any wastewater shall not be allowed to mix with storm water. The storm water from the premises shall be collected and discharged through a separate conveyance system.
- (m) Hazardous chemicals shall be stored in tanks, tank farms, drums, carboys etc. Flame arresters shall be provided on tank farm, and solvent transfer through pumps.
- (n) Process organic residue and spent carbon, if any, shall be sent to cement industries. ETP sludge, process inorganic & evaporation salt shall be disposed off to the TSDF.
- (o) The project proponent shall strictly comply with the Manufacture, Storage and Import of Hazardous Chemicals (MSIHC) Rules, 1989, as amended from time to time. Accordingly, the units shall prepare and update safety report, on-site emergency plan, supply of information relating to the industrial activity under his control to the District Emergency Authority for preparation of offsite Emergency plan, etc. Schedule-5 of the said Rules prescribes the list of Authorities and its corresponding duties. The transportation of all hazardous chemicals shall be as per the Motor Vehicle Act, 1989.
- (p) Fly ash should be stored separately as per CPCB guidelines so that it may not adversely affect the air quality. Direct exposure of workers to fly ash and dust shall be avoided.
- (q) The company shall undertake waste minimization measures as below:-
  - (i) Metering and control of quantities of active ingredients to minimize waste.
  - (ii) Reuse of by-products from the process as raw materials or as raw material substitutes in other processes.
  - (iii) Use of automated filling to minimize spillage.
  - (iv) Use of Close Feed system into batch reactors.
  - (v) Venting equipment through vapour recovery system.
  - (vi) Use of high pressure hoses for equipment clearing to reduce wastewater generation.
- (r) The green belt of at least 5-10 m width shall be developed in nearly 33% of the total project area, mainly along the plant periphery, in downward wind direction, and along road sides etc. Selection of plant species shall be as per the CPCB guidelines in consultation with the State Forest Department.
- (s) All the commitments made to the public during public hearing/consultation shall be satisfactorily implemented.
- (t) As committed by the project proponent monitoring stations shall be installed in nearby villages to monitor the vibrations due to blasting.

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- (u) As committed by the project proponent ground vibrations shall be reduced to NIL.
- (v) At least 1.5% of the total project cost shall be allocated for Corporate Environment Responsibility (CER) and item-wise details along with time bound action plan shall be prepared and submitted to the Ministry's Regional Office.
- (w) For the DG sets, emission limits and the stack height shall be in conformity with the extant regulations and the CPCB guidelines. Acoustic enclosure shall be provided to DG set for controlling the noise pollution.
- (x) The unit shall make the arrangement for protection of possible fire hazards during manufacturing process in material handling. Fire-fighting system shall be as per the norms.
- (y) Occupational health surveillance of the workers shall be done on a regular basis and records maintained as per the Factories Act.
- (z) Continuous online (24x7) monitoring system for stack emissions shall be installed for measurement of flue gas discharge and the pollutants concentration, and the data to be transmitted to the CPCB and SPCB server. For online continuous monitoring of effluent, the unit shall install web camera with night vision capability and flow meters in the channel/drain carrying effluent within the premises.
- (aa) Process safety and risk assessment studies shall be further carried out using advanced models, and the mitigating measures shall be undertaken accordingly.
- (bb) The unit shall comply with the provisions of the Public Liability Insurance Act, 1991 and get the insurance policy under the said Act to ensure immediate relief to the persons affected by accident occurring while handling any hazardous substance.

**10.1** The grant of environmental clearance is further subject to compliance of other generic conditions as under:-

- (i) The project authorities must strictly adhere to the stipulations made by the state Pollution Control Board (SPCB), State Government and/ or any other statutory authority.
- (ii) No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry. In case of deviations or alterations in the project proposal from those submitted to this Ministry, a fresh reference shall be made to assess the adequacy of conditions imposed and to add additional environmental protection measures required, if any.
- (iii) The locations of ambient air quality monitoring stations shall be decided in consultation with the State Pollution Control Board (SPCB) and it shall be ensured that at least one stations is installed in the upwind and downwind direction, as well as where maximum ground level concentrations are anticipated.
- (iv) The National Ambient Air Quality Emission Standards issued by the Ministry vide G.S.R. No. 826(E) dated 16<sup>th</sup> November, 2009 shall be complied with.
- (v) The overall noise levels in and around the plant area shall be kept well within the standards by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels shall conform to the standards

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prescribed under Environment (Protection) Act, 1986 Rules, 1989 viz. 75 dBA (day time) and 70 dBA (night time).

(vi) The Company shall harvest rainwater from the roof tops of the buildings and storm water drains to recharge the ground water and utilize the same for different industrial operations within the plant.

(vii) Training shall be imparted to all employees on safety and health aspects of chemicals handling. Pre-employment and routine periodical medical examinations for all employees shall be undertaken on regular basis. Training to all employees on handling of chemicals shall be imparted.

(viii) The company shall comply with all the environmental protection measures and safeguards proposed in the documents submitted to the Ministry. All the recommendations made in the EIA/EMP in respect of environmental management, risk mitigation measures and public hearing shall be implemented.

(ix) The company shall undertake all measures for improving socio-economic conditions of the surrounding area. CSR activities shall be undertaken by involving local villagers, administration and other stake holders. Also eco-developmental measures shall be undertaken for overall improvement of the environment.

(x) A separate Environmental Management Cell equipped with full fledged laboratory facilities shall be set up to carry out the Environmental Management and Monitoring functions.

(xi) The company shall earmark sufficient funds towards capital cost and recurring cost per annum to implement the conditions stipulated by the Ministry of Environment, Forest and Climate Change as well as the State Government along with the implementation schedule for all the conditions stipulated herein. The funds so earmarked for environment management/ pollution control measures shall not be diverted for any other purpose.

(xii) A copy of the clearance letter shall be sent by the project proponent to concerned Panchayat, Zila Parisad/ Municipal Corporation, Urban local Body and the local NGO, if any, from whom suggestions/ representations, if any, were received while processing the proposal.

(xiii) The project proponent shall also submit six monthly reports on the status of compliance of the stipulated Environmental Clearance conditions including results of monitored data (both in hard copies as well as by e-mail) to the respective Regional Office of MoEF&CC, the respective Zonal office of CPCB and SPCB. A copy of Environmental Clearance and six monthly compliance status report shall be posted on the website of the company.

(xiv) The environmental statement for each financial year ending 31<sup>st</sup> March in Form-V as is mandated shall be submitted to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of environmental clearance conditions and shall also be sent to the respective Regional offices of MoEF&CC by e-mail.

(xv) The project proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the SPCB/Committee and may also be seen at Website of the Ministry at <http://moef.nic.in>. This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the

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vernacular language of the locality concerned and a copy of the same shall be forwarded to the concerned Regional office of the Ministry.

11. The Ministry reserves the right to stipulate additional conditions, if found necessary at subsequent stages and the project proponent shall implement all the said conditions in a time bound manner. The Ministry may revoke or suspend the environmental clearance, if implementation of any of the above conditions is not found satisfactory.

12. The above conditions will be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Water Pollution) Act, 1981, the Environment (Protection) Act, 1986, the Hazardous Waste (Management, Handling and Trans-boundary Movement) Rules, 2016 and the Public Liability Insurance Act, 1991, read with subsequent amendments therein.

SKV  
7/6/2019  
(S. K. Srivastava)  
Scientist E

**Copy to:-**

1. The Principal Secretary, Environment Department, Government of Maharashtra, 15<sup>th</sup> Floor, New Administrative Building, Mantralaya, **Mumbai** (Maharashtra) – 32
2. The Additional Principal Chief Conservator of Forests, Regional Office (WCZ), Ministry of Environment, Forest and Climate Change, **Nagpur** (Maharashtra)
3. The Member Secretary, Central Pollution Control Board Parivesh Bhavan, CBD-cum-Office Complex, East Arjun Nagar, **Delhi** - 32
4. The Member Secretary, Maharashtra Pollution Control Board, Kalpataru Point, 3<sup>rd</sup> and 4<sup>th</sup> floor, Opp. Cine Planet, Sion Circle, **Mumbai** - 22
5. Monitoring Cell, Ministry of Environment, Forest and Climate Change, Indira Paryavaran Bhawan, Jor Bagh Road, **New Delhi** - 3
6. Guard File/Monitoring File/Record File

SKV  
7/6/2019  
(S. K. Srivastava)  
Scientist E

# MAHARASHTRA POLLUTION CONTROL BOARD

Phone : 4010437/4020781  
/4037124/4035273  
Fax : 24044532/4024068 /4023516  
Email : cac-cell@mpcb.gov.in  
Visit At : <http://mpcb.gov.in>



Kalpataru Point, 3rd & 4th floor, Sion- Matunga  
Scheme Road No. 8, Opp. Cine Planet Cinema,  
Near Sion Circle, Sion (E),  
Mumbai - 400 022

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Consent Order No. Format 1.0/BO/CAC-Cell/UAN No. 0000071891/O&A/18<sup>th</sup> CAC-2001001969  
Date-29/01/2020

To,  
M/s Solar Industries India Ltd.,  
Kh. No. 1, 3, 4, 8, 29-31, 37-40, 70-75, 78, 79, 81-83, 85, 124,  
Chakdoh, Near Bazargaon, Tal. Katol, Dist. Nagpur.

Subject: Grant of Consent to 1st Operate for proposed expansion and amalgamation with existing Consent under Red/LSI category.

- Ref: 1. Previous Consent to Operate No. Format 1.0/BO/CAC-Cell/UAN No. 0000008004/4<sup>th</sup> CAC-1612001045 dtd. 30/12/2016 and Consent to Establish No. Format 1.0/BO/CAC-Cell/EIC No. NG-16/1<sup>st</sup> CAC-7819 dtd. 15/06/2016.  
2. Environment Clearance vide P. No. J-11011/28/2017-LA II (I) dtd. 07/06/2019.  
3. Minutes of Consent Appraisal Committee meeting held on 24/12/2019.

Your application UAN No. 0000071891  
Dated: 23/04/2019

For: Grant of Consent to Operate under Section 26 of the Water (Prevention & Control of Pollution) Act, 1974 & under Section 21 of the Air (Prevention & Control of Pollution) Act, 1981 and Authorization under Rule 6 of the Hazardous & Other Wastes (Management & Transboundary Movement) Rules 2016 is considered and the Consent is hereby granted subject to the following terms and conditions and as detailed in the schedule I, II, III & IV annexed to this order:

- The Consent to Operate is granted for a period up to 30/06/2021.
- The actual capital investment of the industry is Rs. 456.6379 Crs [Previous- Rs. 149.24 Crs + Expansion- Rs. 307.3979 Crs] as per undertaking submitted by industry.
- The Consent is valid for the manufacture of

Sr. No.	Products & By-products	Maximum Quantity & COM			
		Previous Consent to Operate	Consent to Establish	As per EC dtd. 07/06/2019	After amalgamation
1.	Slurry/ Emulsion Explosives (Finished)	1,00,000 MT/A	56,250 MT/A	1,56,250 MT/A	1,56,250 MT/A
2.	Detonators (Finished)	125 Million Nos/A	Nil	Nil	125 Million Nos/A
3.	Penta Erythritol Tetra Nitrate (PETN) (Intermediate & finished & Captive)	312.5 MT/A + 5.83 MT/D	Nil	3,000 MT/A	3,000 MT/A
4.	Detonating Fuse (Finished)	0.313 Million Meters/D	Nil	150 Million Meters	150 Million Meters/A
5.	Pentolite/ Cast Booster (Finished)	6.25 MT/D	Nil	1,125 MT/A	3,000 MT/A
6.	Sorbitan Monooleate(SMO) (Intermediate & finished)	12.94 MT/D + 5,280 MT/A	Nil	9,162 MT/A	9,162 MT/A

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7.	Polyisobutylene Succinic Anhydride (PIBSA) (Captive & Finished)	4 MT/D + 4,800 MT/A	Nil	6,000 MT/A	6,000 MT/A
8.	Calcium/ Sodium Nitrate Melt (Captive)	3600 MT/A	Nil	Nil	3,600 MT/A
9.	Dust Suppressant (Solar pride) (Finished)	3.33 MT/D	Nil	Nil	1,000 MT/A
10.	GI/ Cu Wire Coating	90 Million Nos/A	Nil	Nil	90 Million Nos/A
11.	Filling/ Pressing for Filled shells (Captive)	0.21 Million Nos/D	Nil	Nil	63 Million Nos/A
12.	Lead Azide (Captive)	0.03 MT/D	Nil	9 MT/A	9 MT/A
13.	Lead Styphanate (Captive)	0.01 MT/D	Nil	3 MT/A	3 MT/A
14.	ASA Mixing and Drying (Captive)	0.04 MT/D	Nil	12 MT/A	12 MT/A
15.	Cyclotetra methylene tetranitamine, (HMX) & HMX Compounded Product (Captive & finished)	62.5 MT/A	62.5 MT/A	300 MT/A	300 MT/A
16.	RDX & RDX Compounded Products	Nil	125 MT/A	3,000 MT/A	3,000 MT/A
17.	Trinitrotoluene (TNT)	Nil	625 MT/A	3,000 MT/A	3,000 MT/A
18.	Bulk Emulsion (SME)	Nil	1,25,000 MT/A	1,25,000 MT/A	1,25,000 MT/A

4. Conditions under Water (P&CP), 1974 Act for discharge of effluent:

Sr. No.	Description	Permitted quantity of discharge (CMD)	Standards to be achieved	Disposal of treated effluent
1	Trade effluent	153	As per Schedule-I	Recycle/ reuse into process, for cooling tower make up, air-conditioning, fire-fighting, for utility purposes, gardening etc.
2	Domestic effluent	99	As per Schedule-I	

5. Conditions under Air (P & CP) Act, 1981 for air emissions:

Sr. No.	Description of stack / source	Number of Stack	Standards to be achieved
1	Boilers (2 TPH, 3 TPH, 6 TPH & 2 x 12 TPH)	5	As per Schedule-II
2	Process Vents (14 nos.)	14	As per Schedule-II
3	D.G. Sets (160, 2 x 380, 400, 600, 2 x 500, 2 x 300 KVA)	9	As per Schedule-II
4	Thermic Fluid Heaters (2 Nos.)	1	As per Schedule-II

6. Conditions about Non-hazardous Wastes:

Sr. No.	Type Of Waste	Quantity & UoM	Treatment	Disposal
1	Boiler Ash	526 MT/Month	--	Sale to Brick Manufacturers
2	Biological Sludge	2.1 MT/Month	--	Used as manure for gardening

7. Conditions under Hazardous & Other Wastes (M & TM) Rules 2016 for treatment and disposal of hazardous waste:

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Sr. No.	Type of Waste	Category	Quantity	UOM	Treatment	Disposal
1	Empty barrels/ containers/ liners contaminated with hazardous chemicals/ wastes	33.1	50	MT/Y	Recycle	CHWTSDF
2	Chemical Sludge from waste water treatment	35.3	55	MT/Y	Secured Landfill	CHWTSDF
3	Spent Carbon or Filter medium from purification process for organic compounds/ Solvents	36.2	12	MT/Y	Incineration	CHWTSDF
4	Ash from incinerator and flue gas cleaning residue	37.2	60	MT/Y	Secured Landfill	CHWTSDF
5	Used or spent oil	5.1	0.5	KL/Y	Recycle	Sale to Auth. Party/ Recycler/ Re-processor
6	Waste Residue containing oil	5.2	0.5	KL/Y	Recycle/ Incineration	

8. The Board reserves the right to review, amend, suspend, revoke etc. this consent and the same shall be binding on the industry.
9. This consent should not be construed as exemption from obtaining necessary NOC/permission from any other Government authorities.
10. This consent is issued overriding effect to the earlier consent granted vide no. Format 1.0/BO/CAC-Cell/UAN No. 0000008004/4th CAC-1612001645 dtd. 30/12/2016.
11. Industry shall comply with the conditions of Environment Clearance and obtain necessary permission from the Competent Authority/ Explosive Dept.
12. Industry shall improve operation & maintenance of ETPs & STP so as to achieve Consented limits.
13. Industry shall 100% recycle/ reuse treated trade effluent/ sewage so as to achieve ZLD.
14. Bank Guarantee of Rs. 6 Lakh is forfeited towards JVS exceedance and industry shall top-up Bank Guarantee of Rs. 25 Lakh towards operation & maintenance and compliance of the Environment Clearance & Consent conditions.

For and on behalf of the  
Maharashtra Pollution Control Board

(E. Ravendiran, IAS)  
Member Secretary

Received Consent fee of -

Sr. No.	Amount(Rs.)	DD/ DR/ NEFT/ RTGS/ TRXN No.	Date	Drawn On
1	Rs. 12,29,592/-	TXN1904002598	27/04/2019	

Consent fees of Rs. 3,07,398/- balance in the Board will be considered at the time of next renewal of Consent.

Copy to:

1. Regional Officer (Nagpur)/ Sub-Regional Officer (Nagpur-I), M.P.C. Board.  
-They are directed to ensure the compliance of the Consent conditions. Regional Officer, Nagpur is also directed to forfeit bank guarantee of Rs. 6 Lakh towards JVS exceedance and obtain bank guarantee of Rs. 25 Lakh towards operation & maintenance and compliance of the Environment Clearance & Consent conditions.
2. Chief Accounts Officer, M.P.C. Board, Mumbai.
3. CC/CAC desk- for record & website updating purposes.

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**Schedule-I**

**Terms & conditions for compliance of Water Pollution Control:**

- 1) A] As per your application, you have provided Effluent Treatment Plant (ETP) with the design capacity of 311 consisting of primary, secondary & tertiary treatment for the treatment of 153 CMD industrial effluent.
- B] The Applicant shall operate the effluent treatment plant (ETP) to treat the trade effluent so as to achieve the following standards prescribed by the Board or under EP Act, 1986 and Rules made there under from time to time, whichever is stringent:

Sr. No.	Parameters	Standards prescribed by Board (If any)
		Limiting Concentration in mg/l, except for pH
01	pH	6.0 -8.5
02	Oil and Grease	10
03	BOD (3 days at 27°C)	100
04	COD	250
05	Total Dissolved Solids	2100
06	Suspended Solids	100
07	Chloride	600
08	Sulphate	1000
09	Lead (as Pb)	0.1
10	Nitrate (as N)	10
11	Zinc (as Zn)	5
12	Sulphide	2

- C] The treated trade effluent shall be 100 % recycled/ reused into process, for cooling tower make up, air-conditioning, fire-fighting, for utility purposes, gardening etc. so as to achieve ZLD. In no case, treated effluent shall find its way outside factory premises.
- 2) A] As per your application, you have provided the sewage treatment system with the design capacity 150 CMD with MBBR technology for the treatment of 99 CMD sewage.
- B] The Applicant shall operate the sewage treatment system to treat the sewage so as to achieve the following standards/ prescribed under EP Act, 1986 and Rules made there under from time to time, whichever is stringent:
- |                          |               |     |       |
|--------------------------|---------------|-----|-------|
| (1) Suspended Solids     | Not to exceed | 50  | mg/l. |
| (2) BOD (3 days at 27°C) | Not to exceed | 30  | mg/l. |
| (3) COD                  | Not to exceed | 100 | mg/l. |
- C] The treated sewage shall be recycled for utility purposes and applied on land for gardening.
- 3) The Board reserves its rights to review plans, specifications or other data relating to plant setup for the treatment of waterworks for the purification thereof & the system for the disposal of sewage or trade effluent or in connection with the grant of any consent conditions. The Applicant shall obtain prior consent of the Board to take steps to establish the unit or establish any treatment and disposal system and/ or extension or addition thereto.
- 4) The industry shall ensure replacement of pollution control system or its parts after expiry of its expected life as defined by manufacturer so as to ensure the compliance of standards and safety of the operation thereof.
- 5) The Applicant shall install water meters for consuming water as follows:

Sr. No.	Purpose for water consumed	Water consumption quantity (CMD)
1.	Industrial Cooling, spraying in mine pits or boiler feed	548
2.	Domestic purpose	138
3.	Processing whereby water gets polluted & pollutants are easily biodegradable	206
4.	Processing whereby water gets polluted & pollutants are not easily biodegradable and are toxic	10

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5	Plantation/ Gardening	95
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6) The Applicant shall provide Specific Water Pollution control system as per the conditions of EP Act, 1986 and rule made there under from time to time/ Environmental Clearance/ CREP guidelines.



(45)  
Schedule-II

Terms & conditions for compliance of Air Pollution Control:

1. As per your application, you have proposed to provide the Air pollution control (APC) system and also to erect following stack(s) and observe the following fuel pattern-

Sr. No.	Stack Attached To	APC System	Height in Mtrs.	Type of Fuel	Quantity & LOM	S%	SO <sub>2</sub> (kg/Dm)
1	Boiler (2 TPH)	MCD & Bag filter	30.5	Briquette	10.6 MT/D	0.06	
2	Boiler (3 TPH)	MCD & Bag filter	30.5	Briquette	15.9 MT/D	0.06	
3	Boiler (6 TPH)	MCD & Bag filter	30.5	Briquette	28.8 MT/D	0.06	
4	Boiler (2 x 12 TPH)	MCD & Bag filter	30.5	Coal	55 MT/D	0.5	
5	Thermic fluid heaters (2 Nos.)	MCD	30.5	Coal/ Briquette	7.2 MT/D 16.0	0.5	
6	Process Emission Vent (CN/SN/PETN/ Cast Booster)	Scrubber	11				
7	Process Emission Vent (HMX/RDX/ TNT)	Scrubber	18				
5	DG Set (160 KVA)	Acoustic Enclosure	4	HSD	47 Kg/Hr	1	22.5
6	DG Sets (2x300 KVA)	Acoustic Enclosure	4 each	HSD	75 Kg/Hr each	1	36 each
7	DG Set (380 KVA)	Acoustic Enclosure	4	HSD	94 Kg/Hr	1	45
8	DG Set (400 KVA)	Acoustic Enclosure	4	HSD	95 Kg/Hr	1	45
9	DG Set (500 KVA)	Acoustic Enclosure	8	HSD	125 Kg/Hr	1	60
10	DG Sets (2x600 KVA)	Acoustic Enclosure	8 each	HSD	150 Kg/Hr each	1	72 each

2. The Applicant shall provide Specific Air Pollution control equipment as per the conditions of EP Act, 1986 and rule made there under from time to time /Environmental Clearance /CREP guidelines.
3. The applicant shall operate and maintain above mentioned air pollution control system, so as to achieve the level of pollutants to the following standards:

Total Particulate Matter	Not to exceed	150 mg/Nm <sup>3</sup>
HCl/ Acid Mist	Not to exceed	35 mg/Nm <sup>3</sup>
SO <sub>2</sub> (Process)	Not to exceed	50 ppm
NO <sub>x</sub>	Not to exceed	50 ppm

4. The Applicant shall obtain necessary prior permission for providing additional control equipment with necessary specifications and operation thereof or alteration or replacement/ alteration well before its life come to an end or erection of new pollution control equipment.
5. The Board reserves its rights to vary all or any of the condition in the consent, if due to any technological improvement or otherwise such variation (including the change of any control equipment, other in whole or in part is necessary).

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**Schedule-III**

## Details of Bank Guarantees

Sr. No.	Consent (C to E/O/R)	Amt. of BG Imposed	Submission Period	Purpose of BG	Compliance Period	Validity Date
1	C to O	Rs. 25 Lakh (including existing BG of Rs. Lakh)	Within 15 days	Towards O&M of pollution control systems and towards compliance of EC and Consent to Operate conditions.	30/06/2021	Up to 31/10/2021

## History of Bank Guarantee forfeiture

Sr. No.	Consent (C to E/O/R)	Amt. of BG forfeited	Reason of BG forfeiture
1	C to O	Rs. 6 Lakh	Towards JVS exceedance



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Schedule-IV

General Conditions:

- 1) The applicant shall provide facility for collection of environmental samples and samples of trade and sewage effluents, air emissions and hazardous waste to the Board staff at the terminal or designated points and shall pay to the Board for the services rendered in this behalf.
- 2) If the MIDC pipeline is broken/ overflowing chamber, in such cases industry shall not discharge their treated effluent into MIDC drain, it shall be sent to CETP by tanker.
- 3) Industry should monitor effluent quality, stack emissions and ambient air quality monthly/quarterly.
- 4) The applicant shall provide ports in the chimney/(s) and facilities such as ladder, platform etc. for monitoring the air emissions and the same shall be open for inspection to/and for use of the Board's Staff. The chimney(s) vents attached to various sources of emission shall be designated by numbers such as S-1, S-2, etc. and these shall be painted/ displayed to facilitate identification.
- 5) Whenever due to any accident or other unforeseen act or even, such emissions occur or is apprehended to occur in excess of standards laid down, such information shall be forthwith Reported to Board, concerned Police Station, office of Directorate of Health Services, Department of Explosives, Inspectorate of Factories and Local Body. In case of failure of pollution control equipment, the production process connected to it shall be stopped.
- 6) The applicant shall provide an alternate electric power source sufficient to operate all pollution control facilities installed to maintain compliance with the terms and conditions of the consent. In the absence, the applicant shall stop, reduce or otherwise, control production to abide by terms and conditions of this consent.
- 7) The firm shall submit to this office, the 30th day of September every year, the Environmental Statement Report for the financial year ending 31st March in the prescribed Form-V as per the provisions of rule 14 of the Environment (Protection) (Second Amendment) Rules, 1992.
- 8) The industry shall recycle/reprocess/reuse/recover Hazardous Waste as per the provision contain in the Hazardous & Other Waste (M&TM) Rules, 2016, which can be recycled/processed/reused/recovered and only waste which has to be incinerated shall go to incineration and waste which can be used for land filling and cannot be recycled/reprocessed etc. should go for that purpose, in order to reduce load on incineration and landfill site/environment.
- 9) The industry should comply with the Hazardous & other Waste (M,H & TM) Rules, 2016 and submit the Annual Returns as per Rule 6(5) & 20(2) of Hazardous & other Waste (M,H & TM) Rules, 2016 for the preceding year April to March in Form-IV by 30<sup>th</sup> June of every year.
- 10) An inspection book shall be opened and made available to the Board's officers during their visit to the applicant.
- 11) The applicant shall make an application for renewal of the consent at least 60 days before the date of the expiry of the consent.
- 12) Industry shall strictly comply with the Water (P&CP) Act, 1974, Air (P&CP) Act, 1981 and Environmental Protection Act, 1986 and industry specific standard under EP Rules 1986 which are available on MPCB website ([www.mpcb.gov.in](http://www.mpcb.gov.in)).
- 13) The industry shall constitute an Environmental cell with qualified staff/personnel/agency to see the day to day compliance of consent condition towards Environment Protection.
- 14) Separate drainage system shall be provided for collection of trade and sewage effluents. Terminal manholes shall be provided at the end of the collection system with arrangement for measuring the flow. No effluent shall be admitted in the pipes/sewers downstream of the terminal manholes. No effluent shall find its way other than in designed and provided collection system.
- 15) Neither storm water nor discharge from other premises shall be allowed to mix with the effluents from the factory.
- 16) The applicant shall install a separate meter showing the consumption of energy for operation of domestic and industrial effluent treatment plants and air pollution control.

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system. A register showing consumption of chemicals used for treatment shall be maintained.

17) Conditions for D.G. Set

- a) Noise from the D.G. Set should be controlled by providing an acoustic enclosure or by treating the room acoustically.
  - b) Industry should provide acoustic enclosure for control of noise. The acoustic enclosure/ acoustic treatment of the room should be designed for minimum 25 dB (A) insertion loss or for meeting the ambient noise standards, whichever is on higher side. A suitable exhaust muffler with insertion loss of 25 dB (A) shall also be provided. The measurement of insertion loss will be done at different points at 0.5 meters from acoustic enclosure/room and then average.
  - c) Industry should make efforts to bring down noise level due to DG set, outside industrial premises, within ambient noise requirements by proper siting and control measures.
  - d) Installation of DG Set must be strictly in compliance with recommendations of DG Set manufacturer.
  - e) A proper routine and preventive maintenance procedure for DG set should be set and followed in consultation with the DG manufacturer which would help to prevent noise levels of DG set from deteriorating with use
  - f) D.G. Set shall be operated only in case of power failure.
  - g) The applicant should not cause any nuisance in the surrounding area due to operation of D.G. Set.
  - h) The applicant shall comply with the notification of MoEF dated 17.05.2002 regarding noise limit for generator sets run with diesel.
- 18) The industry should not cause any nuisance in surrounding area.
- 19) The industry shall take adequate measures for control of noise levels from its own sources within the premises so as to maintain ambient air quality standard in respect of noise to less than 75 dB (A) during day time and 70 dB (A) during night time. Day time is reckoned in between 6 a.m. and 10 p.m. and night time is reckoned between 10 p.m. and 6 a.m.
- 20) The applicant shall maintain good housekeeping.
- 21) The applicant shall bring minimum 33% of the available open land under green coverage/ plantation. The applicant shall submit a statement on available open plot area, number of trees surviving as on 31st March of the year and number of trees planted by September end, with the Environment Statement.
- 22) The non-hazardous solid waste arising in the factory premises, sweepings, etc. be disposed of scientifically so as not to cause any nuisance / pollution. The applicant shall take necessary permissions from civic authorities for disposal of solid waste.
- 23) The applicant shall not change or alter the quantity, quality, the rate of discharge, temperature or the mode of the effluent/emissions or hazardous wastes or control equipment provided for without previous written permission of the Board. The industry will not carry out any activity, for which this consent has not been granted/without prior consent of the Board.
- 24) The industry shall ensure that fugitive emissions from the activity are controlled so as to maintain clean and safe environment in and around the factory premises.
- 25) The industry shall submit official e-mail address and any change will be duly informed to the MPCB.
- 26) The industry shall achieve the National Ambient Air Quality standards prescribed vide Government of India, Notification dtd. 16.11.2009 as amended.

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ANNEXURE NO. 5

**MAHARASHTRA POLLUTION CONTROL BOARD**

Tel: 24010706/24010437  
 Fax: 24023516  
 Website: <http://mpcb.gov.in>  
 Email: cac-cell@mpcb.gov.in



Kalpataru Point, 2nd and  
 4th floor, Opp. Cine Planet  
 Cinema, Near Sion Circle,  
 Sion (E), Mumbai-400022

RED/L.S.I (R20)

No:- Format1.0/CAC/UAN No.0000119394/CR - 220/00112

Date: 25/01/2022

To,  
 M/s. Solar Industries India Ltd.,  
 KH. No. 1, 3, 4, 8, 29-31, 37-40, 70-75, 78, 79, 81-83,  
 85, 124, Chakdoh, Near Bazargaon,  
 Katol, Nagpur.

**Sub: Grant of Renewal of consent with increase in CI**

- Ref:**
1. Environment Clearance for expansion accorded by MoEF & CC, GOI vide dated 07.06.2019.
  2. Previous 1st C to O for expansion with amalgamation granted by Board vide dated 29.01.2020 which is valid up to 30.06.2021.
  3. Minutes of CAC meeting held on 13.10.2021 & 29.10..2021.

Your application No.MPCB-CONSENT-0000119394 Dated 06.08.2021

For: grant of Renewal of Consent with increase in CI under Section 26 of the Water (Prevention & Control of Pollution) Act, 1974 & under Section 21 of the Air (Prevention & Control of Pollution) Act, 1981 and Authorization under Rule 6 of the Hazardous & Other Wastes (Management & Transboundary Movement) Rules 2016 is considered and the consent is hereby granted subject to the following terms and conditions and as detailed in the schedule I, II, III & IV annexed to this order:

1. The consent to renewal is granted for a period up to 30/06/2026
2. The capital investment of the project is Rs.692.737 Crs. (As per C.A Certificate submitted by industry Existing CI was of Rs. 456.637 Crs + Increase in C.I. by Rs. 236.10 Crs = 692.737 Crs.)
3. Consent is valid for the manufacture of:

Sr No	Product	Maximum Quantity	UOM
Products			
1	Slurry/ Emulsion Explosives (Finished)	156250	MT/A
2	Detonators ( Finished)	125	Million Nos./Year
3	Penta Erythritol Tetra Nitrate ( PETN) ( Intermediate & Finished & Captive)	3000	MT/A
4	Detonating Fuse (Finished)	150	Million meter/Y
5	Pentolite / Cast Booster (Finished)	3000	MT/A
6	Sorbitan Monooleate (SMO) ( Intermediate & Finished)	9162	MT/A

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Sr No	Product	Maximum Quantity	UOM
7	Poly Isobutylene Succinic Anhydride (PIBSA) (Captive & Finished)	6000	MT/A
8	Calcium /Sodium Nitrate Melt (Captive)	3600	MT/A
9	Dust Suppressant ( Solar Pride) (Finished)	1000	MT/A
10	Gl/Cu Wire Coating	90	Million Nos./Year
11	Filling / Pressing For Filled Shells ( Captive)	63	Million Nos./Year
12	Lead Azide (Captive)	9	MT/A
13	Lead Styphanate (Captive)	3	MT/A
14	ASA Mixing And Drying (Captive)	12	MT/A
15	Cyclotetra Methylene Tetranitramine (HMX) & HMX Compounded Product (Captive & Finished)	300	MT/A
16	RDX & RDX Compounded Products	3000	MT/A
17	Tri-nitrotoulene (TNT)	3000	MT/A
18	Bulk Emulsion (SME)	125000	MT/A

4. **Conditions under Water (P&CP), 1974 Act for discharge of effluent:**

Sr No	Description	Permitted (in CMD)	Standards to	Disposal Path
1.	Trade effluent	153	As per Schedule-I	100% recycle/reuse in process to achieve ZLD
2.	Domestic effluent	99	As per Schedule-I	On land for gardening

5. **Conditions under Air (P& CP) Act, 1981 for air emissions:**

Sr No.	Stack No.	Description of stack / source	Number of Stack	Standards to be achieved
1	S-1 to S-4	Boilers (4 Nos - 2 TPH, 3 TPH, 6 TPH & 12 TPH)	4	As per Schedule -II
2	S-5	Thermic Fluid Heater	1	As per Schedule -II
3	S-6	DG Set (400 KVA)	1	As per Schedule -II
4	S-7 to S-8	DG Set (2 x 600 KVA)	2	As per Schedule -II
5	S-9 to S-11	DG Set (3 x 500 KVA)	3	As per Schedule -II
6	S-12 to S-13	DG Set (2 x 300 KVA)	2	As per Schedule -II
7	S-14 to S-15	DG Set (2 x 380 KVA)	2	As per Schedule -II
8	S-16	DG Set (160 KVA)	1	As per Schedule -II
9	S-17	Process Emission vent (CN/SN/PETN/Cast booster)	1	As per Schedule -II
10	S-18	Process Emission vent (HMX/RDX/TNT)	1	As per Schedule -II

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6. **Non-Hazardous Wastes:**

Sr No	Type of Waste	Quantity	UoM	Treatment	Disposal
1	Fly Ash	575	MT/M	Sale	Sale to Brick Manufacturer
2	Biological Sludge	2.1	MT/M	Composting	Used as manure

7. **Conditions under Hazardous & Other Wastes (M & T M) Rules 2016 for treatment and disposal of hazardous waste:**

Sr No	Category No./ Type	Quantity	UoM	Treatment	Disposal
1	5.2 Wastes or residues containing oil	0.5	MT/A	Reprocessing	Sale to authorised party
2	35.3 Chemical sludge from waste water treatment	155	MT/A	Landfill after treatment	CHWTSDF
3	36.1 Any process or distillation residue	12	MT/A	Landfill after treatment	CHWTSDF
4	33.1 Empty barrels /containers /liners contaminated with hazardous chemicals /wastes	50	MT/A	Reconditioning	Sale to authorised party
5	37.2 Ash from incinerator and flue gas cleaning residue	160	MT/A	Landfill	CHWTSDF
6	5.1 Used or spent oil	0.5	MT/A	Recycle*	Sale to authorised party


**(The applicant shall ensure the disposal of all recycle-reprocessing hazardous waste to the actual user having permission under Rule 9 of Hazardous & Other Waste (M & T M) Rules, 2016)**

8. The Board reserves the right to review, amend, suspend, revoke this consent and the same shall be binding on the industry.
9. This consent should not be construed as exemption from obtaining necessary NOC/ permission from any other Government authorities.
10. By forfeiting proportionate BG towards JVS exceedance of stack emissions.
11. PP shall submit upgradation proposal towards existing air pollution control system provided to coal fired 12 TPH boiler within 15 days & shall upgrade the same within next three months.
12. PP shall 100% recycle/reuse treated trade/sewage so as to achieve ZLD outside the premises.
13. PP shall submit/extend the BG to form the sum of Rs. 25.0 Lakh towards O & M of pollution control system and compliance of EC & consent conditions.
14. This consent is issued pursuant to the decision of the 7th Consent Appraisal Committee Meeting held on 13.10.2021 & 29.10.2021.
15. The applicant shall comply with the conditions of the Environmental Clearance granted vide dated 07.06.2019.

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16. The applicant shall make an application for renewal of consent 60 days prior to date of expiry of the consent.

For and on behalf of the  
Maharashtra Pollution Control Board.

  
(Ashok Shingare IAS),  
Member Secretary

**Received Consent fee of -**

Sr.No	Amount(Rs.)	Transaction/DR.No.	Date	Transaction Type
1	6927370.00	TXN2108000669	06/08/2021	Online Payment
2	164802.00	TXN2111001357	18/11/2021	Online Payment

(As per previous consent granted by Board vide dated 29.01.2020, fees of Rs. 3,07,398/- was balance with Board which is considered during this renewal of consent, hence no any fee is balance with Board)

**Copy to:**

1. Regional Officer, MPCB, Nagpur and Sub-Regional Officer, MPCB, Nagpur I
  - They are directed to ensure the compliance of the consent conditions.
  - They are directed to forfeit the bank guarantee of Rs. 5.0 Lakh towards JVS result of stack & obtain top up BG to form the sum of Rs. 25.0 Lakh from the industry.
2. Chief Accounts Officer, MPCB, Sion, Mumbai
3. CAC Desk - for record & updation purposes.

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## SCHEDULE-I

**Terms & conditions for compliance of Water Pollution Control:**

1. A) As per your application, you have provided 6 Nos of ETPs (section wise) of capacity 84 KLD, 100 KLD, 15 KLD - 3 Nos, 70 KLD comprising primary, secondary, tertiary treatment followed by MEE to achieve ZLD for treatment of trade effluent to the tune of 153 CMD.
- B) The Applicant shall operate the effluent treatment plant (ETP) to treat the trade effluent so as to achieve the following standards prescribed by the Board or under EP Act, 1986 and Rules made there under from time to time, whichever is stringent:

Sr.No	Parameters	Limiting concentration not to exceed in mg/l, except for pH
(1)	pH	6.0 -8.5
(2)	BOD (3 days 27°C)	100
(3)	COD	250
(4)	TSS	100
(5)	Oil & Grease	10
(6)	Total Dissolved Solids	2100
(7)	Chloride	600
(8)	Sulphate	1000
(9)	Lead as Pb	0.1
(10)	Nitrate as N	10
(11)	Zinc as Zn	5
(12)	Sulphide	2

- C) The treated effluent shall be 100% recycled for process & secondary purposes after confirming above standards. In no case, effluent shall find its way for gardening / outside factory premises.
2. A) As per your application, you have provided STP of designed capacity 150 CMD based on MBBR technology for the treatment of 99 CMD sewage.
- B) Industry shall comply prescribed standards & disposal path as prescribed at Sr. No. 1 B & C of schedule I.
3. The Board reserves its rights to review plans, specifications or other data relating to plant setup for the treatment of waterworks for the purification thereof & the system for the disposal of sewage or trade effluent or in connection with the grant of any consent conditions. The Applicant shall obtain prior consent of the Board to take steps to establish the unit or establish any treatment and disposal system or an extension or addition thereto.
4. The industry shall ensure replacement of pollution control system or its parts after expiry of its expected life as defined by manufacturer so as to ensure the compliance of standards and safety of the operation thereof.

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5. The Applicant shall comply with the provisions of the Water (Prevention & Control of Pollution) Act, 1974 and as amended, by installing water meters and other provisions as contained in the said act:

Sr. No.	Purpose for water consumed	Water consumption quantity (CMD)
1.	Industrial Cooling, spraying in mine pits or boiler feed	548.00
2.	Domestic purpose	138.00
3.	Processing whereby water gets polluted & pollutants are easily biodegradable	216.00
4.	Processing whereby water gets polluted & pollutants are not easily biodegradable and are toxic	0.00
5.	Gardening	95

6. The Applicant shall provide Specific Water Pollution control system as per the conditions of EP Act, 1986 and rule made there under from time to time/ Environmental Clearance/ CREP guidelines.

#### SCHEDULE-II

#### Terms & conditions for compliance of Air Pollution Control:

1. As per your application, you have provided the Air pollution control (APC) system and erected following stack (s) to observe the following fuel pattern:

Stack No.	Source	APC System provided/proposed	Stack Height (in mtr)	Type of Fuel	Sulphur Content (in %)	Pollutant	Standard
S-1	Boiler (2 TPH)	Multi Cyclone	33.50	Coal 2083 Kg/Hr	0.5	TPM	150 Mg/Nm <sup>3</sup>
S-2	Boiler (3 TPH)	Multi Cyclone	30.00	Coal/Agro-waste 350 Kg/Hr	0.5	TPM	150 Mg/Nm <sup>3</sup>
S-3	Boiler (6 TPH)	Multi Cyclone	30.00	Coal/Agro-waste 500 Kg/Hr	0.5	TPM	150 Mg/Nm <sup>3</sup>
S-4	Boiler (12 TPH)	Multi Cyclone	30.00	Coal/Agro-waste 1200 Kg/Hr	0.5	TPM	150 Mg/Nm <sup>3</sup>
S-5	Thermic Fluid Heater	Mechanical Dust Collector	30.50	Coal/Briquette 300 Kg/Hr	0.5	TPM	150 Mg/Nm <sup>3</sup>
S-6	DG Set (400 KVA)	Stack	4.00	HSD 84.0 Kg/Hr	1.0	SO <sub>2</sub>	40.32 Kg/Day
S-7 to S-8	DG Set (2 x 600 KVA)	Stack	5.00	HSD 126 Kg/Hr	1.0	SO <sub>2</sub>	60.48 Kg/Day
S-9 to S-11	DG Set (3 x 500 KVA)	Stack	4.50	HSD 105 Kg/Hr	1.0	SO <sub>2</sub>	50.4 Kg/Day

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Stack No.	Source	APC System provided/proposed	Stack Height(in mtr)	Type of Fuel	Sulphur Content(in %)	Pollutant	Standard
S-12 to S-13	DG Set (2 x 300 KVA)	Stack	3.50	HSD 63.0 Kg/Hr	1.0	SO2	30.24 Kg/Day
S-14 to S-15	DG Set (2 x 380 KVA)	Stack	4.00	HSD 79.8 Kg/Hr	1.0	SO2	38.30 Kg/Day
S-16	DG Set (160 KVA)	Stack	2.50	HSD 33.6 Kg/Hr	1.0	SO2	16.14 Kg/Day
S-17	Process Emission Vent (CN/SN/PETN/Cast Booster)	Scrubber	11.00	-	-	Acid Mist/HCL	35 Mg/Nm <sup>3</sup>
						So2	50 PPM
S-18	Process Emission Vent (HMX/RDX/TNT)	Scrubber	18.00	-	-	Acid Mist/HCL	35 Mg/Nm <sup>3</sup>
						So2	50 PPM

- The Applicant shall provide Specific Air Pollution control equipments as per the conditions of EP Act, 1986 and rule made there under from time to time/ Environmental Clearance / CREP guidelines.
- The Applicant shall obtain necessary prior permission for providing additional control equipment with necessary specifications and operation thereof or alteration or replacement/alteration well before its life come to an end or erection of new pollution control equipment.
- The Board reserves its rights to vary all or any of the condition in the consent, if due to any technological improvement or otherwise such variation (including the change of any control equipment, other in whole or in part is necessary).

**SCHEDULE-III**  
**Details of Bank Guarantees:**

Sr. No.	Consent (C2E/C2O/C2R)	Amt of BG Imposed	Submission Period	Purpose of BG	Compliance Period	Validity Date
1	Renewal of Consent	Rs. 25.0 Lakh	15 days	Towards O & M of PCs and compliance of consent & EC conditions	30.06.2026	31.10.2026

**\*\*Existing BG obtained for above purpose if any, may be extended for period of validity as above.**

**BG Forfeiture History**

Srno.	Consent (C2E/C2O/C2R)	Amount of BG imposed	Submission Period	Purpose of BG	Amount of BG Forfeiture	Reason of BG Forfeiture
1	C2R	Rs. 25.0 Lakh	--	Towards O & M of PCs and compliance of consent conditions	Rs. 6.0 Lakh	Towards JVS exceedance

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Srno.	Consent (C2E/C2O/C2R)	Amount of BG imposed	Submission Period	Purpose of BG	Amount of BG Forfeiture	Reason of BG Forfeiture
2	C2R	Rs. 25.0 Lakh	15 days	Towards O & M of PCs and compliance of consent conditions	Rs. 5.0 Lakh	Towards Exceedance of JVS result of stack

**BG Return details**

Srno.	Consent (C2E/C2O/C2R)	BG imposed	Purpose of BG	Amount of BG Returned
NA				

**SCHEDULE-IV****General Conditions:**

1. The Energy source for lighting purpose shall preferably be LED based
2. The PP shall harvest rainwater from roof tops of the buildings and storm water drains to recharge the ground water and utilize the same for different industrial applications within the plant
3. Conditions for D.G. Set
  - a) Noise from the D.G. Set should be controlled by providing an acoustic enclosure or by treating the room acoustically.
  - b) Industry should provide acoustic enclosure for control of noise. The acoustic enclosure/ acoustic treatment of the room should be designed for minimum 25 dB (A) insertion loss or for meeting the ambient noise standards, whichever is on higher side. A suitable exhaust muffler with insertion loss of 25 dB (A) shall also be provided. The measurement of insertion loss will be done at different points at 0.5 meters from acoustic enclosure/room and then average.
  - c) Industry should make efforts to bring down noise level due to DG set, outside industrial premises, within ambient noise requirements by proper siting and control measures.
  - d) Installation of DG Set must be strictly in compliance with recommendations of DG Set manufacturer.
  - e) A proper routine and preventive maintenance procedure for DG set should be set and followed in consultation with the DG manufacturer which would help to prevent noise levels of DG set from deteriorating with use.
  - f) D.G. Set shall be operated only in case of power failure.
  - g) The applicant should not cause any nuisance in the surrounding area due to operation of D.G. Set.
  - h) The applicant shall comply with the notification of MoEFCC, India on Environment (Protection) second Amendment Rules vide GSR 371(E) dated 17.05.2002 and its amendments regarding noise limit for generator sets run with diesel.
4. The applicant shall maintain good housekeeping.
5. The non-hazardous solid waste arising in the factory premises, sweepings, etc. be disposed of scientifically so as not to cause any nuisance / pollution. The applicant shall take necessary permissions from civic authorities for disposal of solid waste.
6. The applicant shall not change or alter the quantity, quality, the rate of discharge, temperature or the mode of the effluent/emissions or hazardous wastes or control equipments provided for without previous written permission of the Board. The industry will not carry out any activity, for which this consent has not been granted/without prior consent of the Board.

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7. The industry shall ensure that fugitive emissions from the activity are controlled so as to maintain clean and safe environment in and around the factory premises.
8. The industry shall submit quarterly statement in respect of industries obligation towards consent and pollution control compliance's duly supported with documentary evidences (format can downloaded from MPCB official site).
9. The industry shall submit official e-mail address and any change will be duly informed to the MPCB.
10. The industry shall achieve the National Ambient Air Quality standards prescribed vide Government of India, Notification No. B-29016/20/90/PCI-L dated. 18.11.2009 as amended.
11. The Board reserves its rights to review plans, specifications or other data relating to plant setup for the treatment of waterworks for the purification thereof & the system for the disposal of sewage or trade effluent or in connection with the grant of any consent conditions. The Applicant shall obtain prior consent of the Board to take steps to establish the unit or establish any treatment and disposal system or an extension or addition thereto.
12. The industry shall ensure replacement of pollution control system or its parts after expiry of its expected life as defined by manufacturer so as to ensure the compliance of standards and safety of the operation thereof.
13. The PP shall provide personal protection equipment as per norms of Factory Act
14. Industry should monitor effluent quality, stack emissions and ambient air quality monthly/quarterly.
15. Whenever due to any accident or other unforeseen act or even, such emissions occur or is apprehended to occur in excess of standards laid down, such information shall be forthwith Reported to Board, concerned Police Station, office of Directorate of Health Services, Department of Explosives, Inspectorate of Factories and Local Body. In case of failure of pollution control equipments, the production process connected to it shall be stopped.
16. The applicant shall provide an alternate electric power source sufficient to operate all pollution control facilities installed to maintain compliance with the terms and conditions of the consent. In the absence, the applicant shall stop, reduce or otherwise, control production to abide by terms and conditions of this consent.
17. The industry shall recycle/reprocess/reuse/recover Hazardous Waste as per the provision contain in the Hazardous and Other Wastes (M & TM) Rules 2016, which can be recycled /processed /reused /recovered and only waste which has to be incinerated shall go to incineration and waste which can be used for land filling and cannot be recycled/reprocessed etc. should go for that purpose, in order to reduce load on incineration and landfill site/environment.
18. An inspection book shall be opened and made available to the Board's officers during their visit to the applicant.
19. Industry shall strictly comply with the Water (P&CP) Act, 1974, Air (P&CP) Act, 1981 and Environmental Protection Act, 1986 and industry specific standard under EP Rules 1986 which are available on MPCB website ([www.mpcb.gov.in](http://www.mpcb.gov.in)).
20. Separate drainage system shall be provided for collection of trade and sewage effluents. Terminal manholes shall be provided at the end of the collection system with arrangement for measuring the flow. No effluent shall be admitted in the pipes/sewers downstream of the terminal manholes. No effluent shall find its way other than in designed and provided collection system.
21. Neither storm water nor discharge from other premises shall be allowed to mix with the effluents from the factory.

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22. The industry should not cause any nuisance in surrounding area.
23. The industry shall take adequate measures for control of noise levels from its own sources within the premises so as to maintain ambient air quality standard in respect of noise to less than 75 dB (A) during day time and 70 dB (A) during night time. Day time is reckoned in between 6 a.m. and 10 p.m. and night time is reckoned between 10 p.m. and 6 a.m.
24. The industry shall create the Environmental Cell by appointing an Environmental Engineer, Chemist and Agriculture expert for looking after day to day activities related to Environment and irrigation field where treated effluent is used for irrigation.
25. The applicant shall provide ports in the chimney/(s) and facilities such as ladder, platform etc. for monitoring the air emissions and the same shall be open for inspection to/and for use of the Board's Staff. The chimney(s) vents attached to various sources of emission shall be designated by numbers such as S-1, S-2, etc. and these shall be painted/ displayed to facilitate identification.
26. The industry should comply with the Hazardous and Other Wastes (M & TM) Rules, 2016 and submit the Annual Returns as per Rule 6(5) & 20(2) of Hazardous and Other Wastes (M & TM) Rules, 2016 for the preceding year April to March in Form-IV by 30th June of every year.
27. The applicant shall install a separate meter showing the consumption of energy for operation of domestic and industrial effluent treatment plants and air pollution control system. A register showing consumption of chemicals used for treatment shall be maintained.
28. The applicant shall bring minimum 33% of the available open land under green coverage/ plantation. The applicant shall submit a yearly statement by 30th September every year on available open plot area, number of trees surviving as on 31st March of the year and number of trees planted by September end.
29. The Board reserves its rights to review plans, specifications or other data relating to plant setup for the treatment of waterworks for the purification thereof & the system for the disposal of sewage or trade effluent or in connection with the grant of any consent conditions.
30. The firm shall submit to this office, the 30th day of September every year, the Environment Statement Report for the financial year ending 31st March in the prescribed FORM-V as per the provisions of Rule 14 of the Environment (Protection) (second Amendment) Rules, 1992.
31. The Applicant shall obtain necessary prior permission for providing additional control equipment with necessary specifications and operation thereof or alteration or replacement/alteration well before its life come to an end or erection of new pollution control equipment.
32. The Board reserves its rights to vary all or any of the condition in the consent, if due to any technological improvement or otherwise such variation (including the change of any control equipment, other in whole or in part is necessary).
33. The applicant shall provide facility for collection of environmental samples and samples of trade and sewage effluents, air emissions and hazardous waste to the Board staff at the terminal or designated points and shall pay to the Board for the services rendered in this behalf.

For and on behalf of the  
Maharashtra Pollution Control Board.

  
(Ashok Shingare IAS)

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# SAFETY AUDIT REPORT



**SOLAR INDUSTRIES INDIA LTD.**

Village: Chakdoh, Post: Bazargaon,  
Tahsil: Katol, Amravati Road,  
Nagpur - 440023

**Date: 27.10.2021**



**M. D. SAFETY CONSULTANTS PVT. LTD.**

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### Acknowledgement

We give sincere thanks and gratitude to the management of **Solar Industries India Ltd., Village: Chakdoh, Post: Bazargaon, Tahsil: Katol, Amravati Road, Nagpur - 440023** for giving us the opportunity to carry out the safety audit at the plant located at **Bazargaon** . We also pay our special thanks to EHS department for their help and sparing time for the discussion and their deep concern towards the task is highly appreciable. Our sincere thanks to the all department who gives us full co-operation to reach each corner of the plant and provide all relevant information.

We also express our Special thanks to Plant head and employees with whom we interact and with their open and positive attitude we can able to gather objective evidences which are shown to concern Auditee and after their acceptance given in the form of findings in the report.

Thanks to all once again

**For M D Safety Consultants Private Limited**

**Dnyanesh Mase**

Director

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**About Team:****Dnyanesh Mase:****Qualification:**

- Mechanical Engineer & Advanced Diploma in Industrial safety from Central Labour Institute, Mumbai, Govt. of India.
- Competent Person under The Maharashtra Factories Rules 1963
- Safety Auditor approved by DISH - (MS/DISH/SA/M-001/2020)
- Chartered Engineer (Mechanical Engineering)
- Safety Auditor trained from National Safety Council, Mumbai
- Lead auditor ISO 14001 and Lead Auditor OHSAS 18001.

**Experience:**

More than 22 Years of working in Construction Industry, Steel Industry, Logistic and Engineering industry.

**Member of:**

- Member of Institute of Engineers (India)
- Life member for Indian Society of Non-Destructive Testing (LM 6225 NP)

**Anil Kamble:****Qualification:**

- B. E. - Electrical (V.R.C.E.)
- L.L.B. Nagpur University
- Advanced Diploma in Industrial safety from M S. B. T. E.
- Competent Person under The Maharashtra Factories Rules 1963
- Safety Auditor approved by DGFASLI, Govt. Of India – (SA/09/10-11)
- Chartered Engineer (Electrical Engineering)

**Experience:**

Retired Jt. Director from Directorate of Industrial Safety Health with 35 years' experience for Inspecting various industries in Maharashtra State.

**Member of:**

- Member of Institute of Engineers (India)
- Member of institution of Valuers

**Shrikant Deshpande:****Qualification:**

- Chemical Expert & Advanced Diploma in Industrial safety from Central Labour Institute, Mumbai, Govt. of India.
- Accredited Safety Auditor from DGFASLI, Mumbai Government of India (Regd. No – SA/23/10-11).
- Safety Auditor approved by DISH - (MS/DISH/SA/D-002/2020)
- Auxiliary firefighting course from National Civil Defense College, Nagpur, Ministry of Home Government of India,
- Lead auditor ISO 14001 and Lead Auditor OHSAS 18001.

**Experience:**

More than 20 Years of working in Petrochemical plant, Textile plant, Power plant, Rubber plant, construction Industry and Engineering industry.

**Member of:**

- Secretary of Vidarbha Industrial Safety Committee

**About M D Safety Consultants Private Limited:**

It is our immense Pleasure to introduce our company as a, Safety & Risk Management Consultancy Organization. We have mission to safeguard people, processes, and the environment by assisting our clients in maintaining the safety of their operations. Our mission is accomplished through systematic identification of safety-related deficiencies, and the

development of risk-minimizing solutions as per statutory & legal requirements and beyond that which are cost-effective and based on sound engineering principles.

We offer following Consulting services for Industries like Refineries, Petrochemicals plants, Oil & Gas, Chemical & Pharmaceutical Plants, Engineering Plants, Cement Plants, Power Plant, Sponge iron plant etc.

**For M. D. Safety Consultants Private Limited.**

**Dnyanesh Mase**

Director

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\*Audit documentary evidences maintained with company.

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**SCHEDULE II**  
(See rule 8 and 9)  
**Proforma for Safety Audit Report**

Sr. No.	Questionnaire	Remark
1	Name and address of the factory	Solar Industries India Ltd., Village: Chakdoh, Post: Bazargaon, Tahsil: Katol, Amravati Road, Nagpur - 440023
2	Name of the occupier	Mr. Milind Deshmukh
3	Date of Audit	27.10.2021
4	List of raw material with maximum storage quantity	As per consent condition
5	List of finished products with maximum storage quantity	As per consent condition
6	Manufacturing process flow chart	Attached
7	P.I. Diagram of all plants (Chemical Factories)	NA
8	Name of the Safety Auditor and Certificate No. and name of the person who has carried out safety audit	Dnyanesh Mase : (MS/DISH/SA/M-001/2020) Shrikant Deshpande: (MS/DISH/SA/D-002/2020)
9	Whether enclosed safety audit report as per IS14489 or any such standards prevailing at the relevant time whichever is latest	As per IS:14489



  
Signature of Safety Auditor/Person or employee of an  
Institution authorized to carry out safety audit

I (Occupier) undertake to submit the action taken report on recommendations of Safety Audit on or before... 25.02.2022

  
Signature of the Occupier

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## CHAPTER-I

## SECTION 1: EXECUTIVE SUMMARY

## 1.1 THE ASSIGNMENT

## 1.1.1 GROUP / PLANT OVERVIEW

**Solar Industries India Ltd., Village: Chakdoh, Post: Bazargaon, Tahsil : Katol, Amravati Road, Nagpur - 440023** an ISO 9001:2015 , ISO 14001:2015 , OHSAS 18001:2007 certified automated manufacturing plant engaged in manufacturing , the various products in separate process houses i.e. Slurry / Emulsion Explosives, Electric Detonators, PETN, Detonating Fuse, Cast Booster, Lead Azide and Lead Styphnate manufacturing, Detonator filling-pressing, HMX and compounded products, RDX and compounded products and (TNT)Tri Nitro Toluene.

### 1.1.2 NEED FOR SAFETY AUDIT

According to the provision of section 7- A of The Factories Act, 1948 that the provision of plant and system of work in the factory that are safe and without risk to health, arrangement in the factory for ensuring safety and absence of risk to health in connection with the use handling storage and transport of articles and substances. Management has taken all due care regarding safety of the workers at all stages, but in spite of efforts taken by management accidents may occur in the factory resulting in loss of man days, production. Hence to identify unsafe acts & conditions on shop floor and to bring awareness amongst all employees' need of safety audit is must. Accordingly Management has decided to conduct the external safety audit this year. Also, as per Maharashtra Factories Safety Audit Rules 2014 it is required to conduct the safety Audit.

The company has a clear commitment to meet the highest standards by adopting best possible manufacturing practices without sacrificing safety and environmental regulations. During the course of the assignment, discussions were held with various officials of the company. From these dialogues it was quite evident that apart from the legal obligations the management of **Solar Industries India Ltd.** was really keen for improving the safety culture of the factory. It was, therefore, very prudently thought that if an independent assessment of the status of safety is carried out, it could help the management to identify the areas, and likely hood of any accidents which may take place in the factory. The future safety program could then be designed so as to take corrective actions for "Vulnerable conditions and Actions."

M. D. Safety Consultants Pvt. Ltd., Nagpur is having an accredited safety auditor by state government, competent person under factories act & rules and is a consultant in the field of safety and conducts Safety Audit regularly. Audit team consists of experience experts and certified auditors from DGFASLI. Top management of **Solar Industries India Ltd.** initiated this Safety Audit and engaged auditor for the same. The present Safety Audit is an off – shoot of the above considerations.

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## 1.2 OBJECTIVES

This audit is conducted with the objectives to carry out a systematic critical appraisal of all potential hazards involving personnel, plant, services and operations method; and to ensure that Safety systems fully satisfy the legal requirements and those of the company's written safety policies, objectives and progress.

## 1.3 SCOPE

The scope of the audit is restricted to **Solar Industries India Ltd.**, Chakdoh Plant only. The entire Audit plan including the scope of the audit and depth of the audit is designed to meet the client's specific safety needs, statutory requirements.

## 1.4 TIME SCHEDULE

The time schedule was finalized in the opening meeting for document verification, plant visits and discussion on the draft and cleared the scope and methodology to be adopted for the audit. Audit was carried out during 27<sup>th</sup> October 2021

## 1.5 AUDIT METHODOLOGY

Audit method and procedure as per Indian Standard 14489: 1998 is used to conduct the audit. The methodology is explained in detail in section Six and the same was explained to the senior management of audittee. Evidence is collected through discussion with plant personnel, documents verification and observation of activities and conditions in the areas of concern. Clues suggesting non-conformities are noted if they seem significant, even though not covered by check lists. As the purpose of audit is not to comprehensively check implementation of each safety system element, sample/test check information is collected for the implementation of each element of the safety systems. However recommendations are not only to correct the observed non-conformity, but the implementation of the element as a whole. The audit was conducted by data collection through questionnaire; document verification and plant visit to observe the operations. The employees were contacted and discussions were held with department heads.

## 1.6 OBSERVATIONS AND COMMENTS

As the purpose of audit is not to comprehensively check, implementation of each safety system element, sample/test check information is collected for the implementation of each element of the SAFETY system. During plant visit observations for unsafe conditions/unsafe acts were carried out. Status of the following safety aspects noted and discussed with the concerned persons and comments recorded in the text of this with suggestions wherever appropriate.

- Health and safety policy.
- Safety and Health organization.
  - Safety department
  - Safety committee (s)
- Accident reporting, investigation and analysis
- Safety inspections
- Safety, education and training
  - Training / Periodic training/retraining
  - Safety communication/motivation promotion
- First aid / Occupational health center ☐ General working conditions
  - House keeping
  - Noise
  - Ventilation
  - Illumination
- Hazard identification control
- Safe operating procedures (SOPs)
- Work permit system
- Waste disposal system
- Personal protective equipment's (PPE)
- Fire protection
- Emergency preparedness
- Plant layout and area classification

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- Static electricity
- Pressure vessels (fired and unfired)
- New equipment review
- Lifting machines and tackle
- Mobile equipment and vehicular traffic
- Access
- Material handling
- Tank storage vessel area
- On – site gas cylinders storage area
- Communication system adopted in plant
- Statutory approvals

## SECTION 2 : INTRODUCTION

### 2.1 SITE

M/s. Solar Industries India Limited located at Village: Chakdoh, Amravati Road, Nagpur is manufacturing the various products in separate process houses i.e. Slurry / Emulsion Explosives, Electric Detonators, PETN, Detonating Fuse, Cast Booster, Lead Azide and Lead Styphnate manufacturing, Detonator filling-pressing, HMX and compounded products, RDX and compounded products and (TNT)Tri Nitro Toluene. The process is suitably considered for hazards and risk of fire and environmental components.

### 3-a In the manufacturing of Slurry Explosives following process steps are involved.

- 1.Preparation of Raw Material
- 2.Preparation of Mother Liquor Solution.
- 3.Mixing / Blending of Mother Liquor and solid ingredients.
- 4.Cartridging in various diameters.
- 5.Packing and Storage.

3a-i In stores, various raw material listed below are kept separately as per their consumption.

1. Ammonium Nitrate/ Sodium Nitrate / Calcium Nitrate
2. Sulphur
3. Aluminum Powder
4. Guar Gum
5. Sugar
6. Acetone
7. Corrugated Boxes, Polythene i.e. all packing material. The Raw Materials are weighed in respective store room as per desired quantity.

3a-ii Mother Liquor is prepared by mixing Ammonium Nitrate Melt, Sodium Nitrate and Calcium Nitrate Melt in water and bringing the temperature to 70 Degree C. by steam heating in reactor. Finally prepared mother liquor is transferred to mother liquor holding tank for final use in process plant PP-2.

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3a-iii In Mixing / Blending steps measured quantity of Mother Liquor is pumped into Blender and solid ingredients i.e. Sulphur, Aluminum. Guar gum are added and mixed properly for 10 minutes.

3a-iv After Mixing / Blending of various chemicals, prepared explosives is dumped into hopper. From hopper the material is cartridge in polythene lay flats of various diameters.

3a-v The cartridge explosives are packed in corrugated boxes each weighing 25 kg net. The finally packed material is transferred to storage magazine for storage and onward dispatches.

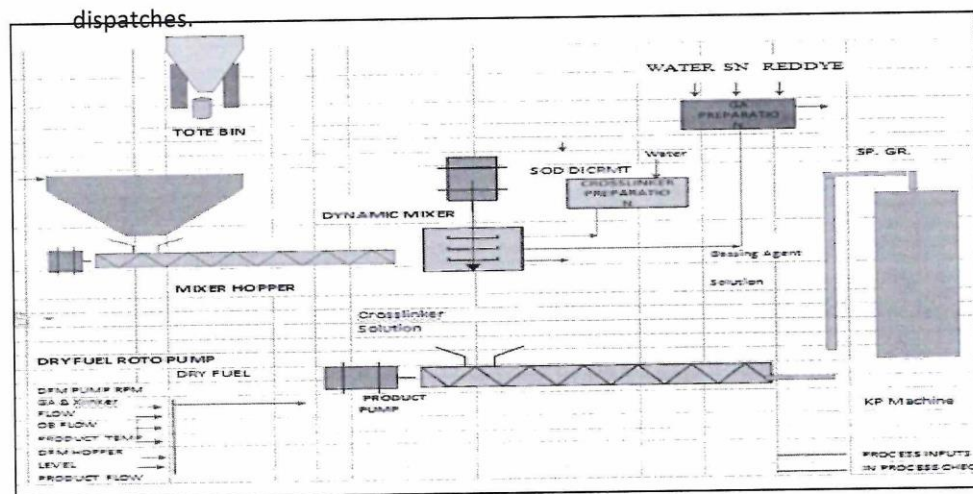
**3-b In the manufacturing of continuous Slurry Explosives following process steps are involved.**

3b-i For preparing dry fuel a specified quantity of Starch powder, Sulphur powder and Aluminum flake are mixed in dry condition with Nitrogen purging in the Dry Fuel Mixing (DFM) Area.

3b-ii For preparing the Oxidizer blend (OB) AN melt, CN, Thiourea etc are mixed in the reactor. For Gum preparation MEG and Guar gum are mixed in a separate reactor. This gum is then added to the OB.

3b-iii Dry Fuel, OB, Cross linker and GA are mixed in the dynamic mixer; prepared explosive is then pumped through roto pump towards KP machine for Cartridging.

3b-iv The cartridge explosives are packed in corrugated boxes each weighing 25 kg net. The finally packed material is transferred to storage magazine for storage and onward dispatches.

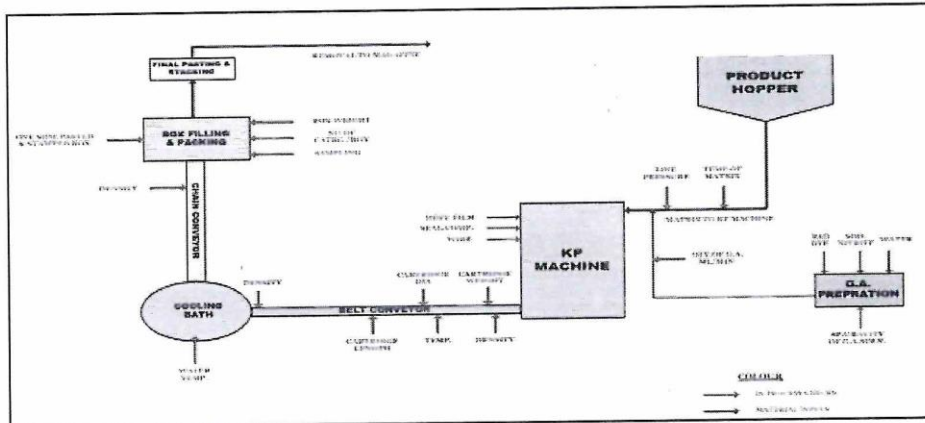
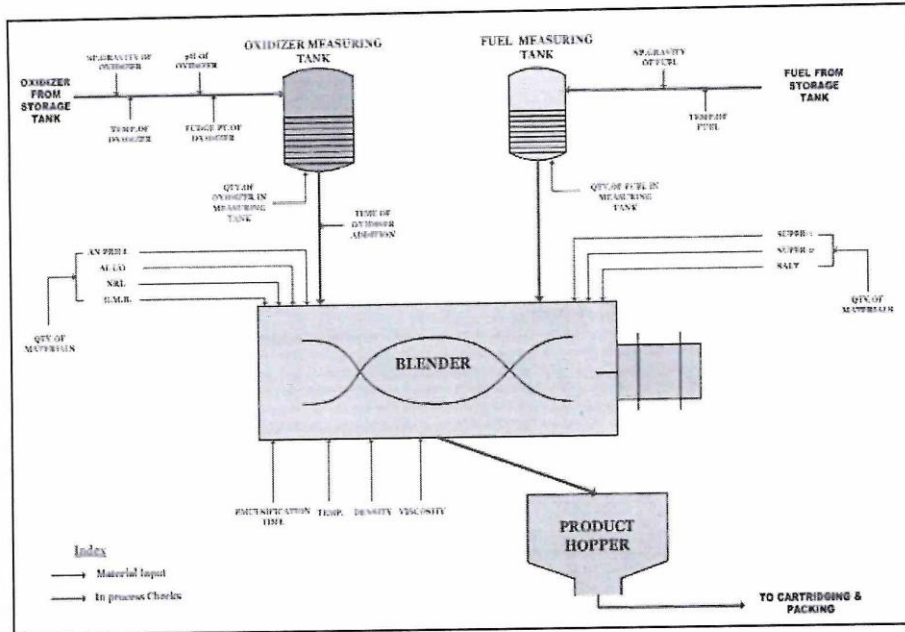


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**3-c In the manufacture of Emulsion Explosives, the following process steps are involved.**

1. Preparation of Raw Material
  2. Preparation of Oxidizer Solution.
  3. Preparation of Fuel Blend.
  4. Preparation of Emulsion Matrix by mixing Oxidizer solution and fuel blend.
  5. Addition of do-pants, if necessary.
  6. Cartridging is various diameters.
  7. Packing.
- 3c-i Various raw materials like A. N. Melt, Sodium Nitrate, SMO, Waxes, emulsifier etc. are sent to the process plants PP4, PP5, PP7, PP9, PP11 , PP12 and PP 16.
- 3c-ii Pre weighed quantities AN, SN etc are charged into a reactor to prepare oxidizer solution.
- 3c-iii Pre weighed quantities of emulsifiers, oils and waxes are taken into another reactor where a fuel blend is prepared.
- 3c-iv Desired quantities of oxidizer solution and fuel blend are pumped into a mixer where emulsification and do-pants addition is carried out.
- 3c-v The emulsion is then pumped into a Cartridging machine and the cartridges sent for packing.

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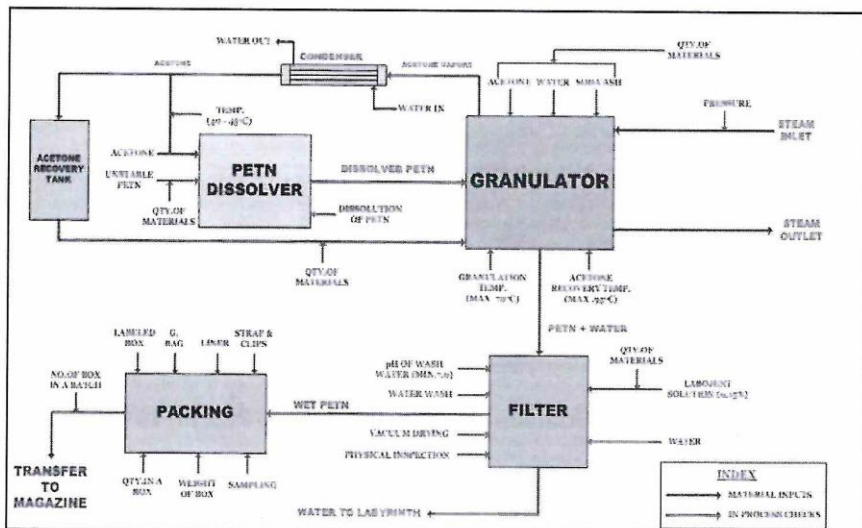
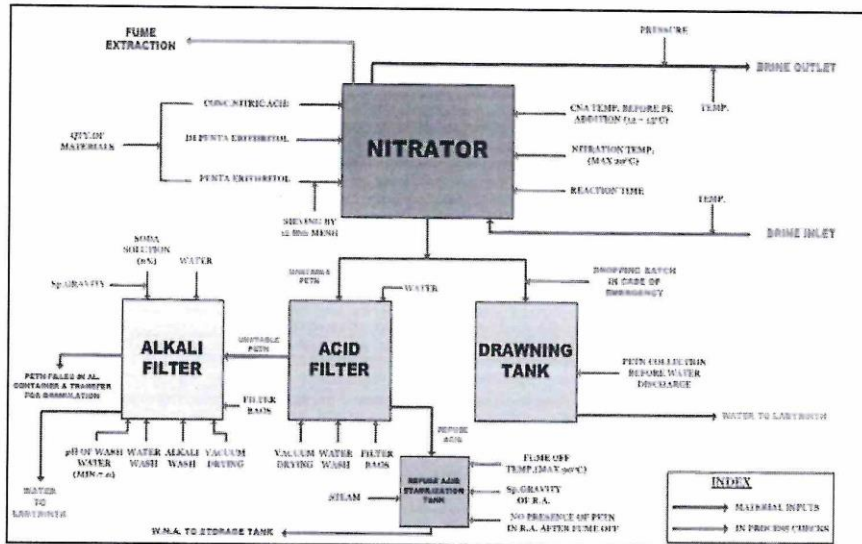


### 3-d PETN is manufactured by the nitration of PE (Pentaerythritol) with Conc. Nitric Acid

- 3d-i Raw materials like PE, Acetone etc are transferred to PP8, PP-10 and PP 14.
- 3d-ii Required quantity of Conc. Nitric Acid is pumped form storage tanks to nitrator, via a measuring vessel, where the temperature of acid is brought down in the desired limits of process by circulating brine.
- 3d-iii PE is gradually added to the acid in the nitrator maintaining the desired temperature with continuous stirring.

3d-iv After all PE is added and nitration is completed, the unstabilized PETN is dropped into the acid filter, where the acid is removed by washing with water and subsequently by alkali solution. This PETN is then re granulated with acetone water before final washing.

3d-v In PP 14, continuous process for manufacture of PETN is used while in PP 8 & PP 10, batch process is used.

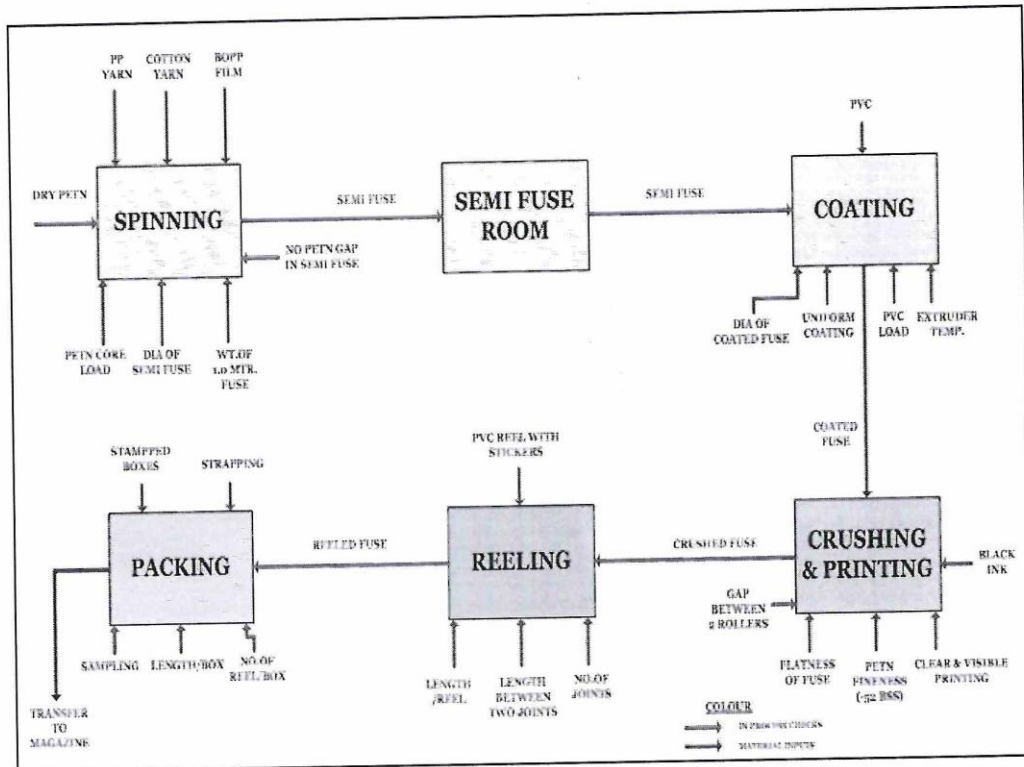


**3-e Detonating fuse** is manufactured by encapsulating core of PETN in BOPP tape and covering this number of strands of polypropylene yarn & by providing a coating of PVC.

3e-i Raw materials like dry PETN, Polypropylene Yarn, cotton yarn and PVC Granules etc. are transferred to plant.

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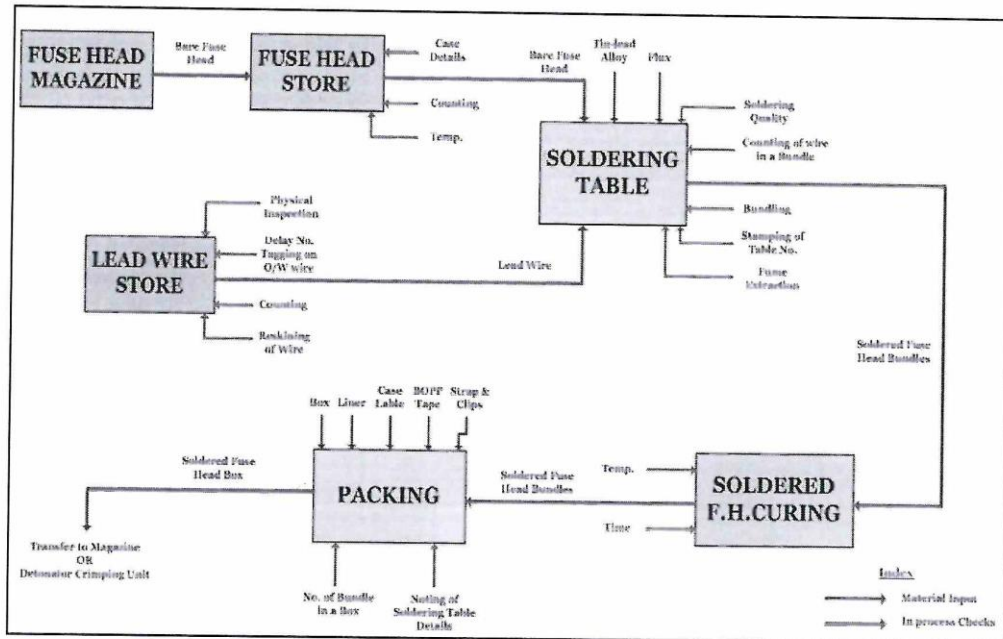
- 3e-ii Semi-Fuse is first prepared in a spinning machine by encapsulating a core of PETN in BOPP tape which in turn has yarns of cotton and Polypropylene covering it.
- 3e-iii Semi-Fuse is then coated with PVC and subsequently passed through crushing rollers.
- 3e-iv This crushed coated fuse is then wound on reels to the desired length, packed in boxes & sent to magazine.



### 3-f Assembly of Electric detonators

- 3f-i In soldered Fuse Heads and filled shells store, material is unpacked and visually inspected for any defects such as rusting, moisture, improper filling of shells etc. and sent to shop floor.

- 3f-ii On the shop floor, soldered Fuse Heads are crimped with filled Shells by pneumatic operated collets at high pressure. After crimping, resistance of the lead wire is measured and 25 Nos. crimped Detonators are bundled and sent for packing.
- 3f-iii Two bundles of 25 each are wrapped in wrapping paper. Such 50 wrapped bundles are packed in fiberboard case. Finally packed fiberboard case is sent to storage magazine for storing & dispatch.



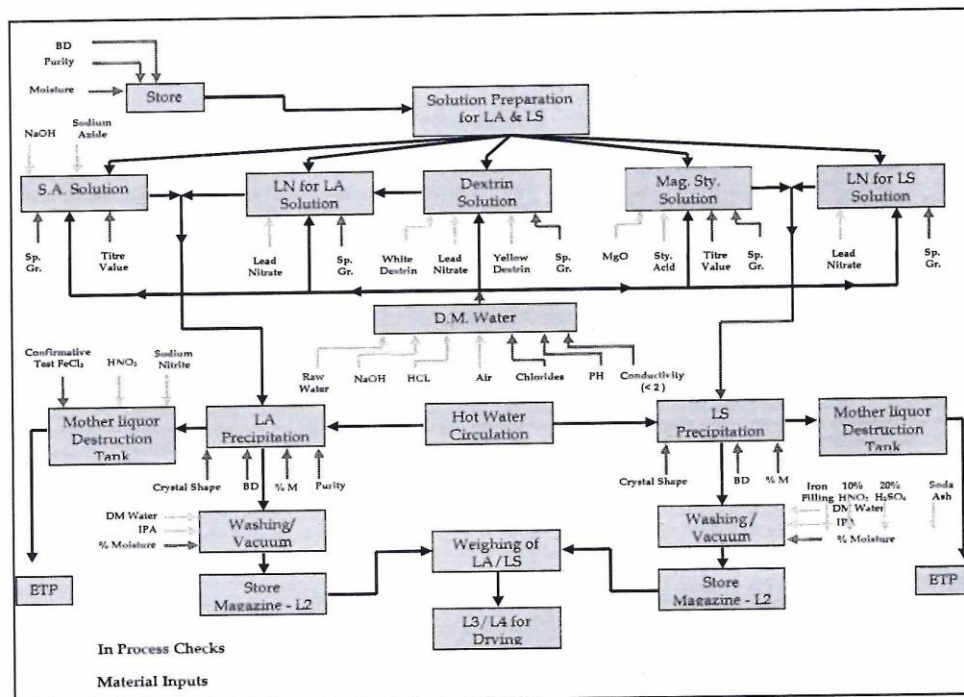
### 3-g Cast Booster Manufacturing

- 3-gi Cast Boosters are made by first melting TNT in a melting pot and then dispersing PETN in the molten TNT. This molten TNT / PETN mixture is cast into plastic shells and paper shells, packed in F/B case & sent to magazine.
- 3-h ASA manufacturing & drying
- 3h-i LA manufacturing measured quantity of lead nitrate solution is taken into the autoclave vessel (vessel temperature 35 – 38o C). The agitator of the autoclave is started with dozing of earlier prepared Sodium Azide solution. The resultant will be Lead Azide which is washed with DM water for Minimum 4 time and then the crystal sized are checked before storing.

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3h-ii LS manufacturing Measured quantity of Magnesium Styphnate solution is taken into the autoclave vessel (vessel temperature 60 – 65o C). The agitator of the autoclave is started with dozing of earlier prepared Lead Nitrate solution. The resultant will be Lead Styphnate which is washed with DM water for Minimum 4 time and then the crystal sized are checked before storing.

3h-iii ASA drying measured quantity of Lead Azide, Lead Styphnate, Lead Stearate and Aluminum is first manually mixed with the help of Aluminum comb, the mixer is termed as ASA and then allowed to get dry in close vicinity with the help coil heater for 1 hour & 30 minutes. The mixer is allowed to cool and collected in conductive bottles (each bottle capacity is approximately 1 Kg).



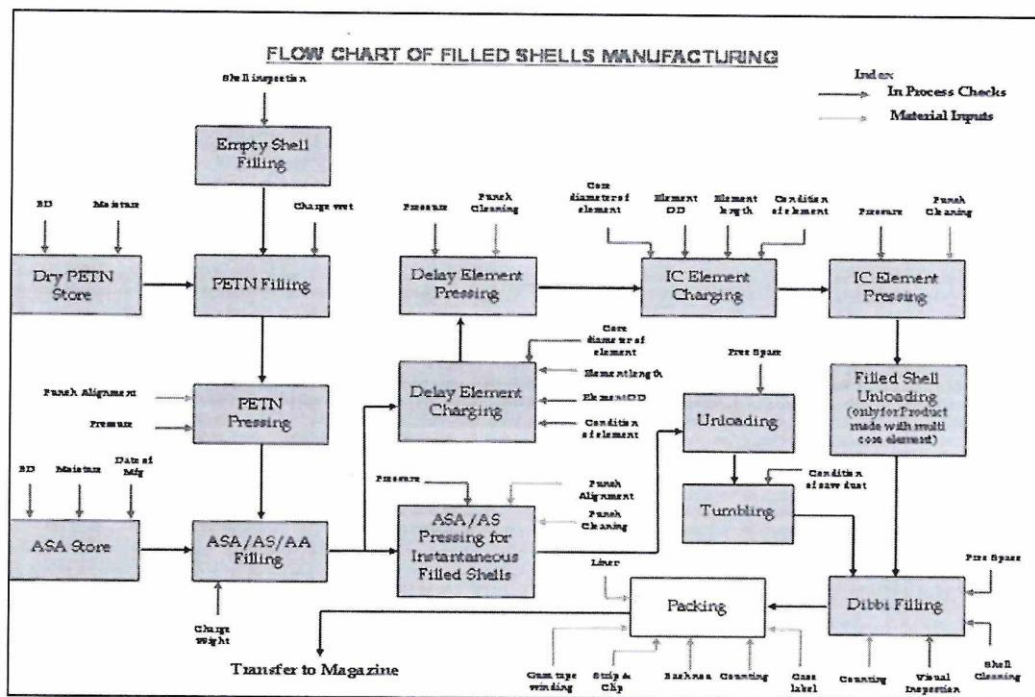
### 3-i Detonator filling and Pressing

3i-i 104 numbers of empty detonators are kept in a ladle made of Hylum material. This ladle is then allowed to go through a series of operations in closed vicinity and maintaining the humidity level.

3i-ii In first cubicle a measured quantity of PETN is filled in all the shells and ladle is passed to second cubicle. In second cubicle the filled PETN is pressed by applying pneumatic

pressure with the help of SS punches for its proper settling. In the third and fourth cubicle ASA filling and pressing is done respectively.

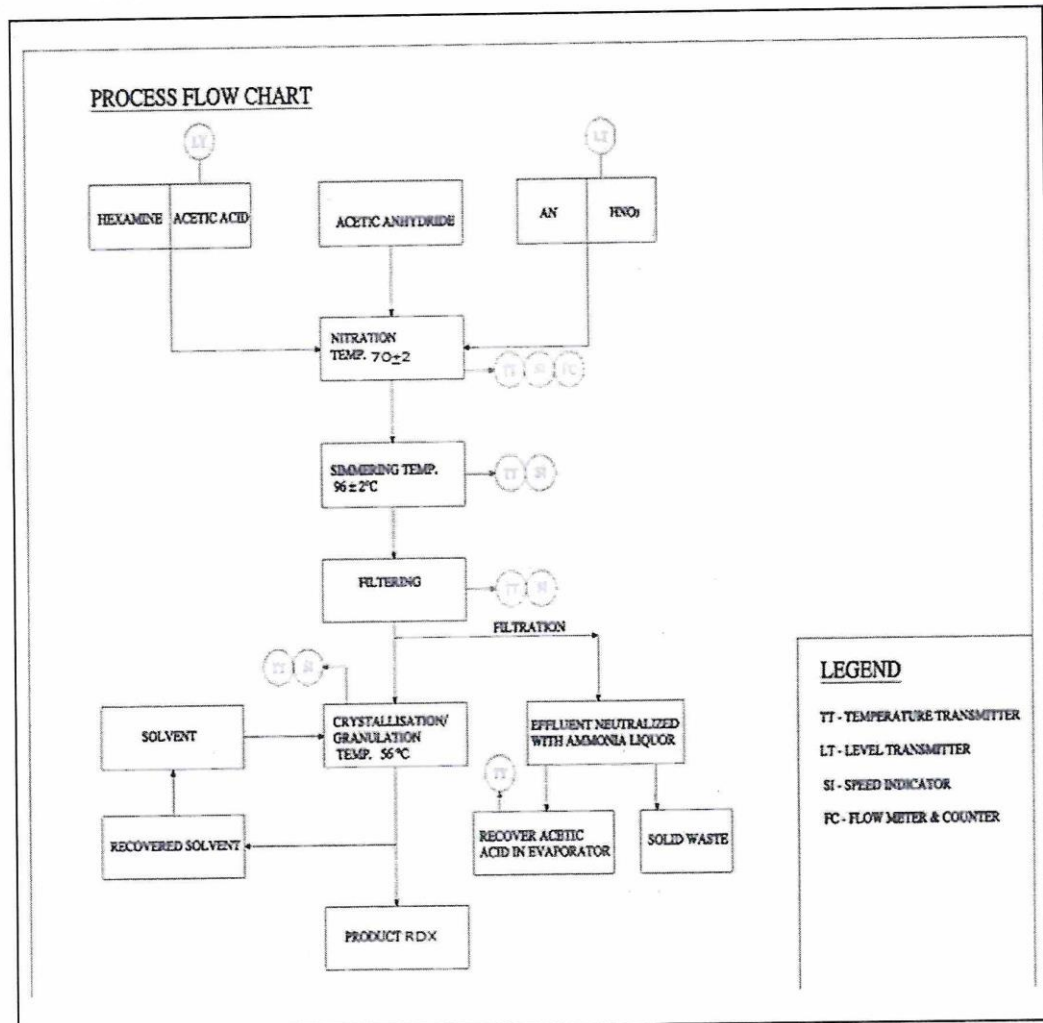
- 3i-iii After filling & pressing operation unloading operation is performed to check any loose material and then the filled shells are allowed to rotate in tumbling barrels with saw dust.
- 3i-iv These filled shells after tumbling are collected and arranged in small cartons in 100 numbers in each carton. 40 numbers of such small cartons with filled shells are then packed in a wooden case.



**3-i HMX & HMX Compounded products** -  $\beta$  grade of HMX is produced by the nitration of Hexamine in Acetic Acid medium by two step Nitration process using a nitrating medium of 85% solution of Ammonium Nitrate in 98% Nitric Acid. The product thus obtained is diluted with water and simmered at 100 deg. C for one hour. This crude HMX is filtered in a vacuum filter and dried in a water oven. It is then crystallized in a solvent and then separated by filtration/Decantation. The HMX is sieved using wet sieving and packed and stored.

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HMX compounded products such as Octol, Ocfol, Ouma are manufactured by adding the different additives at the crystallization stage.

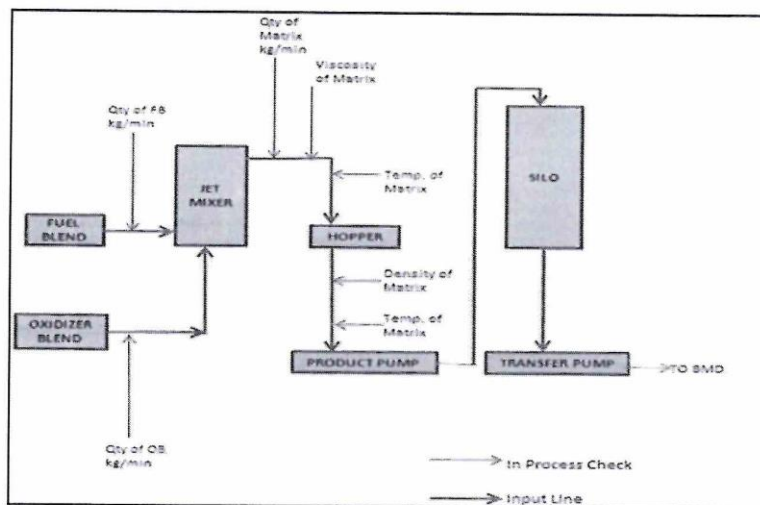


**3-k Bulk Emulsion Manufacturing-** In the manufacture of Bulk Emulsion Explosives, the following process steps are involved.

1. Preparation of Raw Material
2. Preparation of Oxidizer Solution.
3. Preparation of Fuel Blend.
4. Preparation of Bulk Matrix by mixing Oxidizer solution and fuel blend.

3k-i various raw materials like A. N. Melt, Furnace oil, SMO, Zinc nitrate etc. are used

- 3k-ii Pre weighed quantities AN, ZN etc are charged into a reactor to prepare oxidizer solution.
- 3k-iii Pre weighed quantities of Furnace oils and SMO are taken into another reactor where a fuel blend is prepared.
- 3k-iv Desired quantities of oxidizer solution and fuel blend are pumped into a Jet mixer where emulsification carried out.
- 3k-v The Bulk emulsion is then pumped into a hopper and then hopper to silo.
- 3k-vi Finally the bulk emulsion is transferred into BMD vehicle.



### 3-m Manufacture of Tri Nitro Toluene (TNT)

3-m (i) TNT manufacturing is a four step process: a) Nitration b) Washing c) Drying d) Flaking.

3m (ii) Nitration: In nitration TNT reacts with WNA to form DNT, further this DNT reacts with CN A to form TNT. The water generated during the reaction is removed with the help of Oleum. Spent acid generated in the nitration reaction is then sent for denitration where it is broken into WNA and WSA (Weak sulphuric acid).

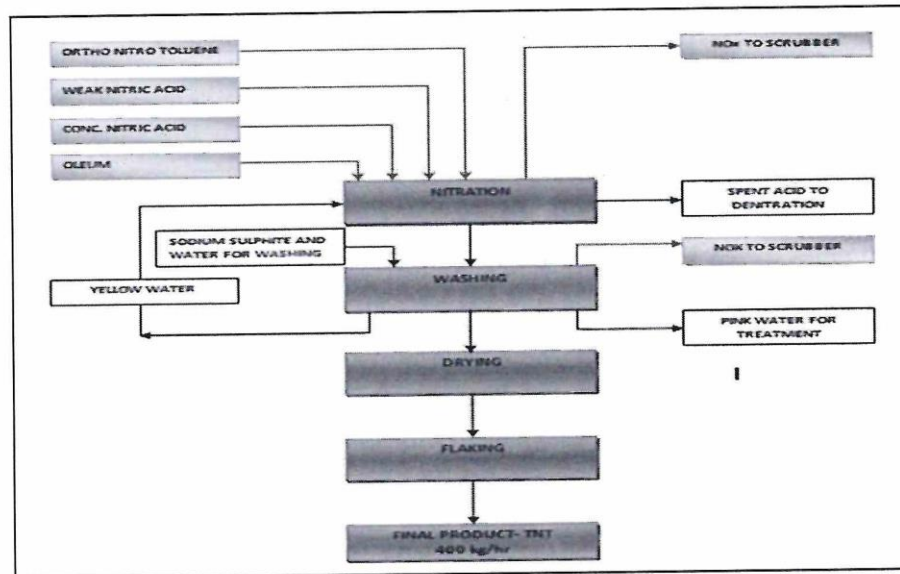
3m (iii) Washing: Impurities in the crude TNT is mainly due to DNT and unsymmetrical TNT cause a depression of the solidification point from 80.8°C for pure TNT to

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78.2 – 78.6 °C. For this reason washing of crude TNT is done with help of sodium sulphite. Pink water generated is further sent for treatment.

3-m (iv) Drying: The purified TNT contains approximately 0.7% dissolved water which must be removed before entering the flaking unit so that the final product will get a high setting point.

3-m (v) Flaking: The molten TNT is picked up on a water cooled rotating drum solidified and scraped off with a doctor blade (material in brass) which shatters it into small irregular pieces. The flakes are collected in a hopper and from there is packed in boxes



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**SECTION 3: AUDIT CONCEPT**

- 3.0** Safety Audit is an important tool for identifying falling standards, areas of risks or vulnerability hazards and potential accidents in proposed and existing plants and processes for determining the action necessary to remove hazards before personal injuries or damage occur. The loss potential in the factory in particular is high and not restricted to large – scale incidents to accidents, fires, spillage of hazardous chemical explosions, toxic gas release and similar incidents.
- 3.1** Safety Audit and inspections are necessary for all industrial activity. The Health and Safety performance of the Organization depends on Management control. Health and Safety must therefore be efficiently managed, if performance is to be effective. Improvement to Health and Safety performance can be stimulated by various means by including the following.
- 3.2** Moving from a reactive to a protective approach to Health and Safety issues i.e. not waiting for an accident, injury or loss to occur before acting. Identifying what exactly needs to be controlled and setting standards and performance measurements criteria.
- 3.3** Adopting the same disciplines to Management Control and Responsibility as are applied to financial or production management.
- 3.4** In short, successful Health and Safety Management requires commitment to a policy and program of continuous improvement by those in charge, together with a regular audit of that program, as an ongoing process.
- 3.5** Updating is the means by which information can be gathered in order to fulfill the requirement for review stipulated in the statute. It is the culmination of a series of activities, which make up and organizations Health and Safety program beginning with the policy statement from the Occupier, which is developed into systems and procedures by middle management for implementation by those carrying out the work of the organization.
- 3.6** Auditing examines each stage in the Health and Safety Management system by measuring compliance, with the controls the organization has developed with the ultimate aim of assessing their effectiveness and their validity for the future.
- 3.7** The Audit system is based on the code of practices on Occupational Health and Safety Audit; framed by the Bureau of Indian Standards (IS 14489 : 1998)

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## SECTION 4: AUDIT OBJECTIVES

This audit is conducted with the following objectives:

- 4.1 To carry out a systematic critical appraisal of all potential hazards involving personnel, plant, services and operation method.
- 4.2 To ensure that SAFETY system fully satisfies the legal requirements and those of the company's written safety policies, objectives and programs.
- 4.3 Audits are designed to achieve the following goals:
- 4.4 To provide the audittee with an opportunity to assess its own SAFETY system standard and identify areas for improvement.
- 4.5 To determine the conformity of the implemented O S & H system with specified requirements and identify areas for improvement and
- 4.6 To meet regulatory requirements.
- 4.7 The following aims were set for the Audit Team:
  - 1.0 To examine and evaluate the accident prevention measures.
  - 1.1 To analyze the safety procedures, systems and practices.
  - 1.2 To observe the working conditions and operating methods, including storage/handling of raw Materials/finished products.
  - 1.3 To pinpoint occupational health hazard.
  - 1.4 To check the adequacy of firefighting arrangements.
  - 1.5 To study waste disposal arrangements.
  - 1.6 To Comment upon various statutory compliance.

## SECTION 5: SCOPE OF WORK

The scope of this report is restricted to **Solar Industries India Ltd. Village: Chakdoh, Amravati road**. All the departments are audited in the plant as per the audit plan.

The following locations/departments are considered during Audit as thrust area.

- Legal
- Production
- HR & Admin
- Maintenance
- Purchase
- Store
- Security

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## SECTION 6: AUDIT METHODOLOGY

- 6.1 The Indian Standard IS 14489: 1998 is used as basis for this audit.
- 6.2 Safety Audit subjects each area of a company's activity to a critical appraisal of all potential hazards. Every component of the total system is included, e.g. policy attitudes, training, features of the process and design, layout of the plant, operating, emergency plans, personnel protection, accident records etc.
- 6.3 **AUDIT PLAN:** The Audit plan is finalized after consultation with lead auditor and the client and communicated to the auditors and audittee. The audit plan is kept flexible to suit site specifics, in order to permit changes in emphasis based on information gathered during the audit and to permit effective use of resources. The plan includes:  
The audit objectives and scope.
- Identification of reference documents (such as the applicable SAFETY System standard and the audit's description and specified requirements of their safety system.
  - Size of the audit team.
  - Identification of the organizational units is to be studied.
  - The schedule for audit activities.
  - The schedule of meetings is to be held with audit management.
  - The list of documents is to be verified by the audit team
  - Audit schedule.
  - Working Documents: The documents required facilitating the auditor's investigations and to document and report results include:
    - Checklist used for evaluating SAFETY System elements (normally prepared by the auditor assigned to audit the specific element)
    - Audit evidence copies of the document as supporting evidence.

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## 6.4 ELEMENTS OF OCCUPATIONAL SAFETY &amp; HEALTH SYSTEM

1	Occupational safety and health policy
2	Safety organizational set – up
3	Education and training
4	Employees participation in Safety management
5	Motivational and promotional
6	Safety manual and rules
7	Compliance with statutory requirements
8	New equipment review/inspection
9	Accident reporting analysis investigation and implementation of recommendations
10	Risk assessment including hazard identification
11	Safety inspection
12	Health and safety improvement plan/targets
13	First aid facilities - occupational health center
14	Personal protective equipment
15	Good housekeeping
16	Machine and general area guarding
17	Material handling equipment
18	Electrical and personal safeguarding
19	Ventilation, illumination and noise
20	Work environment monitoring system
21	Prevention of occupational diseases including periodic medical examination
22	Safe operating procedures
23	Work permit systems
24	Fire prevention, protection and fighting systems
25	Emergency preparedness plans (on-site/off-site)
26	Process/plant modification procedure
27	Transportation of hazardous substances
28	Hazardous waste treatment and disposal
29	Safety in storage and warehousing
30	Contractor safety systems
31	Safety for customers (including material safety data sheets)

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### 6.5 TYPES OF RECORDS EXAMINED DURING THE SAFETY AUDIT

1	Safety policy
2	Safety organization chart
3	Training records on Safety fire and first – aid
4	Record of plant Safety inspections
5	Accidents investigation reports
6	Accidents and dangerous occurrences statistics and analysis
7	Record of tests and examination of equipment's and structures as per statues
8	Safe operating procedures for various operations
9	Record of work permits
10	Record of monitoring of flammable and explosives substances at workplace
11	Maintenance and testing records of fire detection and firefighting equipment
12	Medical records of employees
13	Records of industrial hygiene surveys ( noise, ventilation and levels, illumination levels, airborne and toxic substances, explosive gases)
14	Material safety data sheets
15	On site emergency plans and record of Mock Drills
16	Records of waste disposal
17	Records of effluent discharges to the environment
18	Housekeeping inspection records
19	Minutes of safety committee meetings
20	Approval of layouts from statutory authorities
21	Records of any modifications carried out in plant or process
22	Maintenance procedure records
23	Calibration and testing records
24	Shut down maintenance procedures
25	In service inspection manuals, records including that of material handling
26	Safety budget
27	Inspection books and other statutory records
28	Records of previous audits
29	Safety in transportation of hazardous substances

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Questionnaire of preliminary information about various elements of Safety system is prepared. This is to be filled in by the auditee, and returned to the audit team for study before the field visits.

## 6.6 KEY ON-SITE ACTIVITIES

Understanding management systems, factory processes, plant organization and responsibilities, compliance parameters and other applicable requirements.

Plant visits discussions with management personnel, supervisors and workers, Discussion with Factory Personnel. Specially designed internal controls questionnaire. Assessing strengths and weaknesses.

Collecting Audit Evidence, Record Reviews and Examination of available Data, applicable codes and standards, detailed plant descriptions such as piping and instrumentation drawings flowchart, plant procedures for start-up, shut down, normal operation and emergencies, personnel injury reports, hazardous reports, maintenance records such as

- Critical instrument checks, pressure relief valve tests, pressure vessel inspections process material characteristics.
- Plant visit observations as the purpose of audit is not to comprehensively check implementation of each safety system element; sample/test check information is collected for the implementation of each elements of the safety system. However, recommendations are not only to correct the observed non-conformities, but the implementation of the element as a whole.
- In order to verify the status of inspection systems at site observations for unsafe conditions/unsafe acts are carried out such as follows :
  - Spillage of oil and material on floor
  - Machinery guarding
  - Poor lighting in some area

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- Excess dust / House keeping
- Short cuts
- Not wearing personal protective equipment's
- Not following safety rules
- Lack of classroom and on job training
- Lack of motivation

➤ Evaluating audit evidence, Reporting audit findings

The desired end result of a safety audit is the identification of primarily unrecognized hazards in the light of experience and early recognition of shortcomings in the areas such as the maintenance and testing of critical equipment. These recommendations are of two types: For improvement in the system's specified requirements and for more effective implementation of the specified requirements of the system.

Purpose of the closing meeting with Audittee is to present audit observations and recommendations to the senior management is such so as to ensure that they clearly understand the results of the audit.

**6.7 POST AUDIT ACTIVITIES :** Action plans and follow – up.

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**SECTION 7: MANAGEMENT CO-OPERATION**

The Safety Audit Team expresses deep gratitude towards the Management for giving them the opportunity to review the Safety Systems and share in the experience and expertise on this critical subject. This subject is of vital importance for the Welfare and Economic Prosperity of the Organization on the whole. The Management has, at every stage shown a positive approach while parting with information and while giving facilities to the Team for effectively carrying out the Safety Audit.

Sr. No.	Name of Officers	Designation
1.	Milind Dhakate	Safety Officer
2.	Sushil Kumar Sharma	Safety officer
3.	Dheeraj Rajgure	Safety officer

Every effort has been made to ensure that all statements and information offered in this report are given in good faith and without bias or prejudice. They refer to conditions prevalent at the time of the Audit. All documents and procedures submitted to the Auditor have been verified. During the Audit no test were conducts nor were any tests started, not was any plant or equipment operated for the benefit of our Audit requirement.

Once again the Safety Audit Team sincerely thanks the concerned Management personnel for all the courtesy and assistance rendered by them during the course of the above Safety Audit.

## 2.2 GOOD PRACTICES & RECOMMENDATIONS

### Good Practices:

1. The entire safety of the factory is operating on the principle of "FISHY"

F – Friction

I- Impact

S- Static

H – Heat

Y – Your Behavioral Safety

This enables management to ensure safety at all times and also to develop safety culture at work place.

2. Good housekeeping in entire plant.
3. Adequate approaches to all plant through mode of access, marking of aisles, work areas.
4. Lot of initiatives for utilization of waste water/ effluents inside plant including gardening.
5. Openness of employees for sharing of knowledge & information with respect to safety.
6. Management's support and commitment to ensure safety & injury free working conditions at plant.
7. Availability and retrieval of safety data.
8. Good quantity of tree plantation and green zone development.

The desired end result of a safety audit is the identification of primarily unrecognized hazards in the light of experience and early recognition of shortcomings in the areas such as the maintenance and testing of critical equipment.

These recommendations are of two types:

1. For improvement in the system's specified requirements and

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2. For more effective implementations of the specified requirements of the system.

The audit team makes following recommendations to the management of **Solar Industries India Ltd.** to improve up on the Safety standards.

#### **2.4 AUDIT EVIDENCE**

Records of the evidence collected are maintained at site. After agree upon the Audit findings based on evidences points were finalized.

#### **2.5 ACTION PLAN**

Action on the safety audit report is most important. As the nature of recommendations covers number of aspects of the site activity all cannot be implemented immediately. However, with definite action plan, in a phased manner, the objective can be achieved.

#### **2.6 CONCLUSION**

The management has undertaken systematic safety study program. Under OSO/OHSAS initiatives many activities are taken by management to strengthen safety systems & improve safety performance. It is observed that there is satisfactory system for compliance to the statutory requirements. There is regular follow up system towards the compliance of the statutory requirements and fulfilling occupier's obligations. In conclusion the audit team finds the safety standard of the installations is GOOD to ensure the safe operations at site.

#### **2.7 STRUCTURE OF THE REPORT**

The methodology of the SAFETY AUDIT is described in Section 1.5. Audit Questionnaire collected data followed by site visit observations and comments are available in section 8. Compliance of statutory approvals status is described in section 9. The audit Recommendations are in section 1.7 and it is concluded in section 11. The evidence collected is maintained separately at site itself by the company. We appreciate the positive approach shown by the managements and thanks to all staff

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**Observations / Suggestions:****Legal and General:**

1. Factory license no. 0217761 is available, issued on dated 04.01.2017 and valid till 31.12.2021 for 2500 workers and 2000 + HP.
2. LOTO needs to be implemented in all types of electrical works.
3. Specialized medical tests of the workers who are exposed to dangerous/toxic/poisonous fumes during various operations to be carried out from the certifying surgeon to ascertain the risk of notifiable occupational diseases.

**Soldering and Tagging Room**

1. Work to be carried out as per SOP displayed
2. All interlocks of the hot air Ovens to be checked regularly before use .

**Crimping Room**

- ✓ Manpower - 2+1
- ✓ Filled shell - 200 Nos.
- ✓ SFH – 200 Nos.
- ✓ Crimped Detonator – 100

1. Life expectancy of rubber insulation sheet needs to be checked and sheets to be discarded before the expiry date.
2. Some hair cracks found developed in wall needs to be repaired immediately.
3. The motor of the Desert cooler to be of approved flame proof type or otherwise it shall be installed outside with suitable air ducting system.

**CHP 3 (Crimping, Packing & Casing)**

- ✓ Detonators - 55000 Nos
- ✓ Fuse head - 1,00,000
- ✓ Explosive Limit -30 Kg
- ✓ Man power – 39+3

1. Cracks are developed into the walls needs to be repaired immediately.
2. Safe stacking height needs to be marked and define.

3. Life Expectancy of Conductivity of PVC conducting sheet needs to be checked regularly.
4. All practicable measures to be taken to see that the static charge is not generated while carrying out the operation by seating on chair.

### **Fuse Head Soldering and Solar E-DET**

#### **Manufacturing house.**

✓ E/HQ/MH/20/110(E-130073)

✓ Explosive Limit- 58 Kgs,

✓ Manpower - 91+3

1. Water seepages on the inside walls needs to be arrested immediately.

#### **SL-1**

#### **Lead Azide**

#### **LA Precipitation**

1. Stirrer/Agitator -The provisions of SCH VII annexed to R-57 of TMFR, 1963 to be strictly complied with.
2. All interlocks of auto clove needs to be checked regularly before use.

#### **Lead Nitrate + Sodium Azide**

1. Lead Nitrate – Sodium reactor
2. Contact of the Cables to the pipes to be avoided.

#### **Sodium Azide**

SL. 5- Plan to check?

#### **APA Drying Plant**

Expiry Limit – 6 Kgs

Mon power – 3+1

E/HO/MH/ 20 /108 (E-13071)

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1. Rubber insulation sheet to be provided in front of electrical panel.
2. Interlocks of drying unit to be checked regularly before use.
3. Desert cooler with ordinary electric motor not be used in the area from safety point of view. This is to be installed outside the area with suitable air ducting system or otherwise the motor and other fittings of the desert cooler to be of approved flame proof type.

**SD-1**

Filling and pressing section

E/ HQ/MH/20/108(E130071)

Exp. Limit -99, Manpower – 25+ 2

1. The cracked rubber sheets on the flooring needs to be repaired/replaced, may lead to toppling of trollies during movements.
2. All interlocks of tumbler and pressure filling unit to be checked regularly before use.
3. All steam pipelines, operating valves, gaskets gland, flange joints to be checked regularly.
4. Grass and shrubs on traverses need to be cut and removed regularly.

**DF – Spinning**

1. All open drains of pits need to be securely fenced.
2. The moving belt drive , Moving pulleys on detonations spinning machine to be securely fenced.

**Coating machine**

1. The moving belt drive, all moving pulleys drive , moving shafts and moving vertical bars of the coating machine to be securely fenced.

**PD-5 PETN drying-**

- ✓ E/HQ/MH120/96(E113464)
- ✓ Explosive Capacity -800 Kg,
- ✓ Manpower – 4+1

1. V belt drive of the vacuum pump to be securely fenced.

2. Cracks observed on the wall of room needs to be repaired immediately.
3. Life expectancy of rubber insulation sheet needs to be checked regularly and discarded before the expiry date.

**Cast Booster**

- ✓ E/HQ/MH/20/97/(E 113500)
- ✓ Explosive Capacity – 600 Kgs
- ✓ Manpower – 16 + 2

1. Concentration of TNT fumes needs to be monitored as per provision sec.41F of the TFA,1948 (SCH-II).
2. Ventilation in the area to be maintained in accordance with the provisions of R- 22A of TMFR,1963, Ventilation survey needs to be carried out, localized exhaust draught and hood system needs to be modified.
3. SOP in local language needs to be prepared and displayed for cleaning and removal of sludge from collection tank. Use of PPEs to be insisted upon during sludge removal work.

**Continuous PETN (PP-14)**

- ✓ E/HQ/ MH/20/94 (E-113426)
- ✓ Explosive Capacity – 1000 Kg
- ✓ Manpower – 4 + 2

1. All Nitration reactors, Nozzle filter, Crystallizer needs to be checked regularly.
4. The concentration of Nitrous fumes and Nitric acid fumes needs to be monitored as per provision sec.41F of the TFA,1948 (SCH-II).
5. The interlocks of the scrubber to be checked regularly and scrubbing system to be effective during all working hours.
6. All Interlocks of the machines in nitration process, temperature control devices, pressure control devices to be checked regularly and records to be maintained.

**Nitric Acid Storage Tank**

1. The provisions of SCH XII annexed to R-114 of TMFR,1963 to be strictly compiled with.
2. Cautionary notice boards needs to be displayed in local language.
3. Use of PPEs to be insisted upon during working.

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4. SOP in local language needs to be prepared and displayed for unloading of nitric acid.
5. The rusted M. S. structure to be painted immediately.
6. Loose electrical cabling needs to be enclosed with suitable cable dressing.
7. The damaged and broken A. C. sheets of the roofing and cladding to be replaced immediately. While carrying out such work the provisions of R- 73F of TMFR,1963 to be strictly complied with.

#### **OB and FB Preparation**

✓ E/HQ/MH/20/7(E13748)

1. All Valve, Gasket glands of tank to be checked regularly.
2. The provisions of SCH VII annexed to R-57 of TMFR, 1963 to be strictly complied with.

#### **PP-12**

##### **Small dia manufacturing Plant**

✓ E/HQ/MH/2017 (E13748)

✓ CLASS 2-1000 Kgs

✓ Manpower -15+3

1. Toe guard needs to be provided to working platform of blender machine.
2. Intake nip between moving roller and moving conveyor of the box packing needs to be securely fenced .

#### **Slurry Section -PP-11**

✓ E/HQ /MH/20/7/E-13748

✓ Explosive Capacity-1000 Kg

✓ Man power-20+2

1. Crane in the slurry section to be tested from competent person and report to be maintained in form 11.

Internal Safety Audit:

#### **Boiler house**

1. The Ash and coal dust nuisance to be minimized by taking suitable measures the work place monitoring to be done, housekeeping in the area to be improved.

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2. Approach roads to various work places to be clear and in sound condition.
3. Intake nips between moving roller and moving conveyor at head ends and Tail ends to be securely fenced.
4. All steam pipe lines, valves, gasket glands to be checked regularly.
5. Pull cord and limit switches of the conveyor belts to be checked regularly before use.
6. Toe guard needs to be provided to working platform of coal crusher.
7. SOPs in local language needs to be prepared in respect of following operations
  - a) startup/shut down procedure
  - b) Ash Silo cleaning
  - c) clinker removal.
  - d) Boiler Scrapping
8. Noise level survey needs to be carried out at boiler basement area.
9. Suitable toe guard needs to be provided to the at Ash silo platform.
10. In handling/manipulation/use of HCL – The provision of SCH XII annexed to R-114 of TMFR,1963 to be strictly complied with.

#### **Thermic Fluid Heater**

1. The provision of R-73 ZA of TMFR,1963 to be strictly complied with.
  - a) The quarterly analysis of thermic fluid
  - b) Examination of the thermic fluid heater once in year.
  - c) Examinations of the thermic heater coils.
2. Suitable dyke to be provided to the collection tank where the overflow thermic fluid gets accumulated.

#### **Fuel Tank**

1. Overflow indicators needs to be provided to fuel tanks.
2. MSDS of chemical/fuels to be known to all concerned.
3. All pipelines, Valves, Flange joints, gaskets need to be checked regularly.
4. SOP in local language needs to be prepared and displayed for unloading of oils (SMO/PIB).
5. Xylene which is highly flammable solvent, is used for cleaning purpose.all practicable measures to be taken to prevent static charge and to prevent fire, Xylene to be

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handled carefully using required PPEs and all electrical equipment's to be of approved flame proof type.

6. All dispensing pipes to be checked regularly to see that they are in sound condition.
7. Gas cylinders to be kept away from direct sunlight.

#### **HMX Plant – (Reported during audit under annual Shut Down)**

1. The MSDS and hazards associated with the chemicals used in Nitration, crystallization, Hydrolysis to be known to all concerned. The use of required PPEs to be insisted upon while working. All interlocks of the machines to be checked before use.

#### **Tank**

##### **Concentrated Nitric Acid, Ammonia (25 %), Acetic acid, Acetic anhydrite**

1. In handling/ Manipulation/Use of acids and corrosive substances the provisions of schedule XII annexed to R-114 of TMFR,1963 to be strictly complied with.
2. SOP in local language to be displayed for unloading of acids and corrosive substances.
3. The concentration of fumes in the area to be monitored regularly in accordance with the provisions of Sec.41 F of TFA, 1948.
4. All Dispensing pipe needs to be checked regularly and to be made in sound condition.
5. SOP in local language needs to be prepared and displayed for unloading of chemicals.
6. Spent acid Tank – Suitable dyke needs to be provided to the spent acid storage tank.
7. All practicable measures need to be taken to prevent thermal expansion.

##### **Distillation of acetic acid (Reported during audit under Shut down)**

1. The applicability of SMPV rule s for storage tank of ammonia to be checked.
2. All practicable measures to be taken to prevent any leakage of ammonia, the use of PPEs to be insisted upon while handling ammonia, Suitable ammonia leakage detector to be provided.

#### **NaOH**

**SN-01, - Shock tube Manufacturing,**

**E/HO/MH/20/52 (E 32609)**

**Explosive Capacity - 50 Kg**

**Manpower – 24 X 2**

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1. Aluminum powder and HMS to be handle carefully to prevent fire/exposer.
2. All practicable measures shall be taken to prevent dust exposer.

**HMX + Aluminum Powder****SN-02,****Mixing Building, E/Q/MH/20/52 (E32609)****E/HQ/MH/20/52(E32609)****Explosive Capacity – 125 Kg****Manpower – 2+1**

1. The provisions of R-73ZB of TMFR, 1963 of hot water generator to be strictly complied with.
2. All interlocks of hot water generator to be checked regularly.
3. All practicable measures to be taken to prevent Aluminum powder- Dust explosion.
4. SOP and work instruction in local language needs to be prepared and displayed in respect of hot water generator.
5. All sensors of Vertical elevator to be checked before use.
6. Toe guards needs to be provided to all working platforms
7. All pits drain to be securely fenced.

1. The provisions of R-73ZB of TMFR, 1963 of dryer to be strictly complied with.
2. All interlocks and sensor of Robotic and Automatic system of filling activity of HNX + Aluminum powder into nano tube to be checked regularly before use.
3. Noise level needs to be monitored.
4. Stretching and entangling to be made effective to avoid the initiation, all Interlocks needs to be checked regularly.
5. Coiling machine: Suitable guarding to be provided to coiling machine.

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**CLOSING MEETING**

Closing meeting with the senior management of **Solar Industries India Ltd.** for respective departments was held off at the end of plant visit i.e. on 27.10.2021. The observations and recommendations of the audit were discussed and agreed in the closing meeting.

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## SAFETY AUDIT CHECKLIST

## 1. HEALTH &amp; SAFETY POLICY

1	Does the Organization have a health and safety Policy? (If yes, please attach one copy)	Yes,
2	Do you have corporate safety Policy?(If yes, please attach one copy)	Yes,
3	Who has signed the health safety policy?(indicate his position)	Occupier
4	Whether it is prepared as per guidelines of the statutory provisions?	Yes
5	When was the safety policy declared and adopted?	No date mentioned
6	How many times it has been updated till now?	Not updated
7	Whether the policy is made know to all?	Yes (Displayed in front of office)
8	Whether the safety policy was scrutinized by outside expert agency?	No
9	What was the last date of updating?	Not Available
10	Does it find a place in the annual report?	No

**Observations:**

1. Policy is not in line with The Maharashtra Factory Rule1963, R-73L.
2. Policy reviewed from the date of declaration by OHSAS auditor but same can be reviewed from internally as well as external certified agency with respect to requirements of The Factories Act & rules.
3. Organization need to prepare policy in line with The Maharashtra Factory Rule1963, R-73L which deals with involvement of each level of employees including top management arrangement for making policy effective.
4. Policy need to review and update with respect to manufacturing process requirement and a regular review mechanism need to set through proper SOP.

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**2. HEALTH & SAFETY ORGANIZATION**

11	Does the factory have a safety department?	Yes
12	if yes, furnish the following information's	
	Name , Designation & Qualification	Mr. Rahul Guha, Head - Safety B. Sc. Tech.(Chemical Engineering) Competent Person Authorized by CCOE, PESO,India Mr. P. K. Mahata DGM – Safety
	Experience	40 Years
	Status	Section Head
ii)	Strength of the safety department including safety Officers and staff.	05
13	Does the head of safety department / safety Officer report to the chief executive?	Yes
14	How often is the safety officers retrained in the latest techniques of the total safety management? What is the frequency of retraining?	As and when required
15	What additional duties the safety officer is required to do?	NA
16	What is the power of safety officer vis-à-vis unsafe condition or unsafe act?	To stop work immediately

**OBSERVATIONS**

2A.1 Factory Manager controls the overall operations of the factory under the guidance of Occupier. Safety Officer look after the day – to – day safety activities of the factory.

**Safety Committee :**

17	Does the factory have a safety committee(s)? Give details of their types, structures and terms of reference.	Yes , Chaired by Factory Manager, Secretary Safety Officer, Dr. as member with other section head
18	Is the tenure of the safety committee(s) as per the statute?	Need to form as per MFR R73J
19	How are the members of safety committee (s) selected?	Equal from management & worker side.
20	How often are the meetings of safety committee(s) held?	Monthly
21	What are the subjects? Are the problems discussed in the meeting?	Injury Data, HIRA, Improvements in safety etc.
22	How are the recommendations of the committee(s) implemented?	Through section heads and monthly monitoring systems
23	Are the minutes of safety committee(s) meetings circulated among the members?	Yes
24	Are the MOM forwarded to the trade union(s), CEO and Occupier?	Yes
25	How the management and trade union play their active roles in supporting and accepting the committee(s) recommendations?	By raising safety issues and appreciating best practices on safety matter.
26	How are the safety committee(s) members apprised of the latest developments in safety, health and environment?	By safety officer

**Observations:**

2B.1 Agenda for safety committee meeting shall be in line with the requirements of The Maharashtra Factories rules, 1963 R 73 L.

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2B.2 Points discussed in safety committee meeting can be displayed on notice board for communication to all employees.

### Safety Budget:

27	What is the annual safety budget?	Sufficient funds are made available for safety
28	How much percentage is this budget of the total turnover of the company?	As per the requirement
29	How much budget has utilized till date?	As per the requirement
30	Is the safety budget adequate?	Yes
31	How is the safety budget arrived at?	NA
32	What is the pattern of expenditure for the last five years?	Increasing
33	What are the approved sanctions for the expenditure in this budget?	As and when required provision done
34	Does this budget get reflected in the annual report of the company?	Yes under plant expenses

### OBSERVATION

Management is taking all measures to make sure to maintain the safety related things in Time with proper approvals from top management. There may be no constraint for Safety related activities due to lack of budget.

### 3. ACCIDENT REPORTING, INVESTIGATION AND ANALYSIS

35	Whether the accident data for the last three years for reportable and non-reportable accident available?	Yes
36	Is there any system of classifying and analyzing the near-miss incidents and accidents? Give the details.	Yes data available analysis need to be done as per IS 3786
37	Are all near-miss incidents and accidents reported and investigated?	Yes

38	For how many years are the investigation reports retained?	As per legal requirements
39	By whom the accident statistics and data are maintained?	Safety Officer
40	How is the top management apprised of these data?	Immediately & reviewed on monthly basis and in safety meetings
41	Is the accident statistics effectively utilized? If yes, how?	No, analysis need to be done as per IS 3786 .
42	What nature of injuries occurred during the last three years?	Nil
43	How do you ensure implementation of the recommendations to avoid the recurrence of the incidents and accidents?	Through improvement projects & Horizontal deployment of same.

**OBSERVATIONS**

- 3.1. Accident register is maintained.
- 3.2 The data should be utilized to assess the training needs while designing the training program.
- 3.3 ISHIKAWA /Fish Bone diagram can be used for injury analysis.

<b>3 SAFETY INSPECTIONS</b>
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44	What type of safety inspections are carried out and what are their frequencies?	Lifting tools & Tackles, Pressure Vessels, Testing of Earth pit, Transformer oils, Interlock & Limit Switches, Sensors of various machines & equipments
45	Is there any system of internal inspections?	Yes
46	Who does the inspection?	Maintenance Team

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47	Are the checklists prepared for these inspections? (Specify item wise, for example, housekeeping, fire protection etc.)	Yes
48	To whom the recommendations are submitted?	Factory Manager, Safety Committee

### OBSERVATIONS

- 3.1 There is formal internal inspection system at site for critical locations at regular intervals. Inspections are carried out by employees on routine but checklist must be sign as inspected by and checked by.
- 3.2 Check sheet must be in line with the legal requirements and shall cover major points.
- 3.3 Safety inspection checklists can be modified if required in view of avoiding occurrence of similar type in accidents or injuries.
- 3.4 Check sheet can be verified at regular frequency with the accident analysis reports for modification required if any.

### 4 SAFETY EDUCATION AND TRAINING

49	Is there any training department?	Yes, through HR
50	Is there any programmed of induction training?	Yes
51	Mention the duration of induction training for each category of employees?	16 man-hours per plant related employee per year
52	Whether the assessment of the trainee worker is done or not?	Yes
53	What infrastructural facilities with audio - visual support are available for training?	Projector, screen, room, speaker

54	Do the programmers cover the plant safety rules, hazard communication and any other special safety rules or procedures unique to the plant or specific departments?	Yes
55	Whether the training programmers are conducted in the local language?	Yes in Hindi & Marathi
56	Whether visit to safety institutions / Organizations are arranged?	At present no

**Observations:**

1. Specialized training like JSA, risk assessment, material handling, Work Permit System can be covered in annual training program.
2. Accident investigation, near miss reporting can be used as input to develop annual training calendar.
3. Focus on material handling and equipment's is strengthen further.

**PERIODIC TRAINING/RETRAINING**

57	Are all the employees trained and what is the frequency of such training?	Training need identification was carry out on yearly basis by HR & department HODs and based on that training calendar is made
58	Do the training programmes cover safety and health aspects and if so how much (in terms of number of sessions / hours)?	Based on yearly training calendar and Objective.
59	Do the trained supervisors train their own employees in safety and health aspects?	Though OJT training.
60	Is the retraining performed whenever new hazards / process changes are followed / introduced?	Through refresher training

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61	How are the senior management personnel trained in safety and health?	Through safety training plan
62	How many employees have been trained in safety and health in the last five years? Give break up with details.	Data needs to be maintained
63	How many man-days / hours are used in training the employees?	Data needs to be maintained
64	How do you ensure that the training is put to use by the employees trained in safety and health?	Through CCTV's and personnel monitoring
65	What is the training plan for the next two years? Give details.	Not available
66	What documentation system has been established regarding safety and health training?	Worker's feedback system.

**Observations:** Training modules shall be prepared In Hindi or local languages. Retraining of all employees' associates can be planned

#### **SAFETY COMMUNICATION/MOTIVATION/PROMOTION**

67	Does the factory have safety suggestion scheme? Give details.	Yes, during safety week celebration & also throughout the year.
68	Does your factory participate in National Awards / Suggestion scheme?	Yes
69	Has your factory been awarded during last five years?	Yes
70	Are safety contests organized in the factory? Give details.	Yes, During Safety week celebrations
71	What are the publications of your organization? Do they include information on safety and health subjects?	No

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72	Is the literature on safety and health made available to the employees?	Not Available
73	How is the safety and health publicized in your factory?	On notice board
	Bulletin Board	
	Post Serious Accidents	
	News Letter	
	Others, Specify?	Posters
74	Does the organization celebrate safety day / week or organize safety exhibition?	Yes
75	When was the last safety day / week celebrated?	04/03/2021

<b>5 FIRST AID</b>
--------------------

76	Are adequate numbers of first aid boxes provided? Give location details.	Yes
77	Is there any first aid / ambulance room?	OHC is available with ambulance room facilities
78	Are qualified / trained first aider's available in each shift?	Yes
79	How many qualified / trained First aide's available at each plant / department?	03
80	How many persons are trained / given refreshers training in first aid in a year?	23

**Observations:**

1. Yearly competitions are conducted during safety day celebration.
2. First aiders are trained from St. John Ambulance.

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3. Frequency for conducting training/awareness/competitions can be reduced to half yearly or also it can be spread quarterly on theme based competition.
4. Retraining need to plan to keep them aware on first aid activities after one year.

<b>6 OCCUPATIONAL HEALTH CENTRE</b>
-------------------------------------

81	Whether occupational safety and health centre is provided or not?	Yes
82	Does it conform to the provisions of the existing legislation?	Partially
83	Are the Medical Attendants / Doctors available in each shift?	No
84	Is ambulance van available in each shift?	Yes
85	Any liaison with the nearest hospital(s) Give details.	Yes, Dandhe Hospital, Nagpur

**Observations:**

1. Safety & Health center is available in the plant but not in conformity with the law.
2. Tie up is done with nearby hospital.
3. Contact numbers of associated hospital can be displayed at main gate.
4. Registered medical officer with adequate qualifications need to be appointed.

<b>7 GENERAL WORKING CONDITIONS</b>
-------------------------------------

86	Are all the passages, floors and the stairways in good condition?	Yes
87	Do you have the system to deal with the spillage?	Yes
88	Do you have the sufficient disposable bins clearly marked and whether these are suitably located?	Yes

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89	Are drip trays positioned wherever necessary?	Yes, near machines and pumps
90	Do you have adequate localized extraction and scrubbing facilities for dust, fumes and gases? Please specify.	Yes, Exhaust system available
91	Whether walkways are clearly marked and free from obstruction?	Yes
92	Do you have any inter-departmental competition for good housekeeping?	Yes
93	Has your organization elaborated good house-keeping practices and standards and made them known to the employees?	Yes, Factory is in process of getting 5S
94	Are there any working conditions which make the floors slippery? If so, what measures are taken to make them safe?	Yes, water spray arrangement on the floor in various sections of the factory.
95	Does the company have adequate measures to suppress polluting dust arising out from road transport?	Yes

**Observations:**

1. For housekeeping 5 S system is inducted in the factory.
2. Color coding system need to develop for identification of type of waste disposal [Non-hazardous/hazardous] as per specified category.

**NOISE**

96	Are there any machines / processes generating noise? Specify.	Yes, D G Set operation
97	Was any noise study conducted?	Monitoring done
98	Which are the areas having high- level noise?	D G Set operation & compressor area

113

99	Have engineering and administrative controls been implemented to reduce noise exposure bellow the permissible limits?	Yes
100	Is there a system of subjecting all those employees to periodic audiometric test who work in high level noise areas?	Yes
101	Whether the workers are made aware of the ill-effects of high noise?	Yes
102	Whether any personal protective equipment along with ear muff / plugs are provided and used?	Yes, wherever necessary

**VENTILATION**

103	Whether natural ventilations are adequate or not?	Ventilation survey needs to conduct
104	Whether dust / fumes/ hot air are generated in the process? Give details.	Solvent fumes
105	Is there any exhaust dilution ventilation system in any section of the plant?	Provided
106	Whether any study has been carried out in the section(s) to check the record?	Ventilation survey needs to conduct
107	Are periodic / preventive maintenance of ventilation system carried out and record is maintained?	Yes (AHU on shop floor & coolers outside building, AC in offices,)
108	Does any ventilation system recirculate the exhausted air in work areas?	No
109	Is the work environment assessed and monitored?	Yes
110	Whether personal protective equipment is given to workers exposed to dust / fumes and gases? Give details.	Yes, dust mask

**ILLUMINATION**

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111	Was any study carried out for the assessment of illumination levels?	No, study needs to be conducted
112	Is there any system of periodical cleaning and replacing the light fittings / lamps in order to ensure that they give the intended illumination levels?	Yes, through electrical maintenance
113	Are the workers subject to periodic optometry tests and records maintained? Give details.	No

**Observations:**

1. Noise level monitoring done on regular basis.
2. Illumination study needs to be conducted on regular basis.
3. Environment monitoring results need to be compared with IS standards or with The Maharashtra Factory Rule, 1963 rules.
4. Ventilation survey needs to be conducted on shop floor as per R 22-A of The Maharashtra Factories Rules, 1963.

<b>8 HAZARD IDENTIFICATION AND CONTROL</b>
--

114	Are all hazardous areas identified?	Yes
115	What are the types of hazards (physical-noise, heat, etc and chemical fire, explosions, toxic release etc)	Fire, Explosions & Toxic release
116	What steps have been taken to prevent these hazards? Give details.	Risk assessment done and accordingly measures are taken
117	Are there any safety inter-locks, alarms and trip systems? Give details.	Yes (temp. controls & Pressure Controls)
118	Are these tested periodically? How often? Please specify.	Yes, Monthly basis by maintenance dept.

115

119	Are there any ambient monitoring devices with alarms for leakage of hazardous materials? Give details.	Not Applicable
120	Are safety audit or HAZOP study or any other studies carried out and the recommendations implemented? Give details.	Internal safety audit done and recommendations are being implemented
121	What has been the major modifications done in plant / process and has the approval of the competent authority concerned?	Not Applicable
122	What decision and monitoring equipment are available and used for checking the environmental conditions in and around the plant? Give details.	Environment monitoring by authorized agency done

**Observations:**

1. MCLS study needs to be conducted in respect to CNA tank.

<b>9</b>	<b>SAFE OPERATING PROCEDURE (SOPs)</b>
----------	--

123	Are written safe operating procedures available for all operations?	Yes
124	Whether the written safe operating procedures displayed or made available and explained in the local languages to the workers?	Yes
125	Whether the safe operating procedures are prepared jointly by the plant and safety departments?	Yes

116

10 WORK PERMIT SYSTEM		
126	What system is used to ensure that existing safe operating procedures are updated? Give details.	Time to time review through management meeting.
127	Have the workers been informed of the consequences of failure to observe the safe operating procedures?	Yes
128	Are contractor workers educated and trained to observe safety at workplace?	Yes
129	Whether contractor's workers are permitted on process / operations? Give details.	Yes

130	What necessary types of Work permits exist in your factory? Give details.	Work at height, Hot Work, Electrical Work & other
131	What are the hazardous chemicals handled?	Yes (Explosives, Flammable & Toxic)
132	Are the keys kept for individual locks which are used for electrical lock outs with the supervisor concerned?	LOTO need to develop

**Observations:**

1. LOCK OUT/TAG OUT to be implemented.

117

<b>11</b>	<b>WASTE DISPOSAL SYSTEM</b>
-----------	------------------------------

133	Is identification done for various types of wastes? Give details.	Yes
134	Are these quantities less than those specified by the hazardous wastes? ( Management and handling Rules-1989)	Yes
135	What are their disposal modes?	CHWTSDF, Butibori
136	What are the systems/ measures adopted for controlling air / water / land pollution?	As per CONSENT of MPCB/CPCB condition
137	What is the system of effluent treatment plant and whether it is approved by the competent authority?	ETP/STP available
138	How are the treated effluent used?	Gardening

**Observations:**

1. Color coding for disposal bins or adequate name plate can be given on used bins.

<b>12</b>	<b>PERSONAL PROTECTIVE EQUIPMENT (PPE)</b>
-----------	--

139	Has a list of required PPE for each area / operation been developed and the required PPE is made available to the workers?	Yes
140	Are the safety department and the workers consulting for the selection of PPE?	Yes
141	Have the workers been trained in proper use of PPE?	Yes

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142	What are the system of replacement / issue of PPE?	Through store
143	What are the arrangements for safe custody and storage of PPE provided to the workers?	Lockers are provided
144	Are the contractor's workers provided with the required PPE? Who is responsible? Give details.	Yes, through contractor / management
145	Are the PPE conforming to any standard? Give details.	As per IS standard
146	Give the detail of PPE and also specify the responsibility for their inspection and maintenance.	Body Shield, Safety shoe, helmet, ear plug, hand gloves

**Observations:**

1. Leather Shield provided to the workers shall confirm to IS standard.

<b>13 FIRE PROTECTION</b>
---------------------------

147	Indicate on a plant layout the location, number (Quantity) and types of portable fire extinguishers available.	Available
148	Are the fires fighting system and equipment approved, tested and maintained as per relevant standard?	Yes, need to get NOC from Directorate of Fire, GOM, Mumbai

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149	What is the inspection and maintenance schedule of above extinguishers? Who perform these functions?	Monthly basis
150	Which areas of the plant are covered by fire hydrants? Indicate the location of hydrant points and how the required pressure maintained in the system and ensured?	Ring Main system provided.
151	What is the capacity of dedicated water reservoir for supply to the hydrants? What is the source of water?	300M3 water storage tank,
152	i) How is the power supply to the fire hydrant pump ensured?	Through Electrical Panel
	ii) What is the alternate source of supply in case of power failure?	D.G. set
153	Are all personnel conversant with the fire prevention and protection measures? Give details.	Yes
154	What percentage of plant personnel and staff and officers has been trained in the use of portable fire extinguishers? Give details.	More than 05%
155	Do you have fixed or automatic fire fighting installation(s) in any section of your plant?	Yes
156	Are the fire alarms adequate and free from obstructions?	Yes
157	Do you have fire department? If yes, give details.	No
158	What is the system for conducting mock drills? Give details.	Quarterly basis
159	Do you have any mutual aid scheme with any of your neighboring industries or any local Organization(s)?	NO but tie up with NMC Fire Dept., Ngapur

160	Give details of the existing fire resistant walls and doors.	Yes
161	Do you have any system of color coding for all the pipelines for hazardous chemicals? Give details including marking of flow directions.	No, Needs to be done as per IS standard
162	Are there any safe containers for movement of small quantities of hazardous chemicals? Give details.	Yes (Through trollies & wooden containers)
163	Are all self-closing fire doors in good condition and free from obstructions?	Yes
164	How many major and minor incidents / fires were there in the factory during the last five years? Give department / Plant wise.	No data
165	Have all the fire / incidents been investigated and corrective actions taken? Give break up.	NA

**Observations:**

1. Fire NOC needs to be obtained from Directorate of Fire, GOM, Mumbai and form 'B' needs to be obtain on six monthly basis from license agency as per The Maharashtra Fire Prevention & Life Safety Measure act

<b>14 EMERGENCY PREPAREDNESS</b>
----------------------------------

166	Is there an on-site emergency plan for your factory? (attach a copy of the plan)	Yes
167	What is the frequency of conducting mock drill of on-site emergency plan?	Quarterly basis
168	What are the number and location of emergency control center, assembly points?	Main gate Layout attached
169	Whether emergency team or the key personnel identified?	Yes

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170	Are suitable and adequate protective and rescue equipment available? How is the emergency rescue team trained to use this equipment?	Yes on yearly basis
171	How is the emergency communication with local bodies and other organizations ensured? Give details.	Telephone numbers displayed
172	Is any alternate power sources identified? Give details.	Yes D.G. set available
173	What is the medical emergency response system? Give details.	Tie up with Dande Hospital, Nagpur
174	Are you a member of any mutual aid scheme in your area? If so give details.	NA
175	How many emergency alarm system(s) is / are available? Give details.	One

**Observations:**

1. Onsite emergency plan is available at site. Hardcopy need to be maintain at security gate.

<b>15 PLANT LAYOUT AND AREA CLASSIFICATION</b>
--

176	What is the system of classifications of hazardous zone in the plant for electrical installations? Please specify.	Classification done based on risk assessment
177	Whether periodic inspection and preventive maintenance of electrical installations is done by a qualified person and record is maintained?	Yes
178	Whether plant layout with area classification has been displayed at appropriate place(s)?	Yes at main gate

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**Observations:**

1. List of authorize person need to display at electrical installation
2. First Aid chart needs to be displayed at electrical area in local language.

<b>16</b>	<b>STATIC ELECTRICITY</b>
-----------	---------------------------

179	Whether the process (s) and equipment generate and accumulate static charge has been identified? Give details.	Yes
180	Whether all such equipment are properly bonded and earthed?	Yes
181	How is electrical resistance for earthing circuits maintained? Are periodic inspections done and recorded?	Monthly Basis
182	Are adequate earthing arrangements made at the terminal points where hazardous chemicals are handled through pipes?	Yes
183	Are anti-static charge devices fitted wherever necessary?	Yes
184	Whether these devices are periodically checked and maintained by a qualified person?	Yes

**Observations:**

1. Every equipment inside factory is provided with double earthing as good practice, but it is being observed that both the earthing wires are connected at same fixing point where as they should be at two separate fixing points.
2. The movable trollies shall be effectively earthed to prevent static charge during their movement or the wheels of the trolley shall be of antistatic type.
3. Electrical resistance for earthing circuits monitored on yearly basis, which shall be done before monsoon and after monsoon as per IER.

123

## 17 PRESSURE VESSELS (FIRED AND UNFIRED)

185	Give details of plants, piping and vessels which are operated at a pressure greater than the atmospheric pressure?	Air receivers
186	How is it ensured that the working pressure inside the pressure vessel / pressure plants will not exceed their maximum working pressure for which it is designed?	Safety gauges, safety relief valve installed
187	What means of isolating the pressure vessels or means to prevent rise in pressure are installed?	Safety relief valve installed
188	What standards and codes of practice are adopted for design, fabrication, operation and maintenance of the pressure vessels and record maintained?	As per IS standard
189	How is the pressure vessels tested? Give details.	As per the provision of R65 MFR1963
190	Is there any competent person for testing these pressure vessels? Give details.	No, testing done by competent person approved by DISH
191	How are the recorded results verified?	From maintenance department &
192	Give details of safety devices available for these pressure vessels?	Safety Relief valve Pressure gauge
193	Whether log book for pressure vessels and pressure plants has been maintained?	Yes

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**18 NEW EQUIPMENT REVIEW**

194	What is the system for effecting any change in the existing plant, equipment or process? Whether it is approved by the appropriate competent authority?	Yes
195	Whether the P&I diagrams and other related documents are updated accordingly?	P & I diagram needs to be prepared & updated as and when any modification is done

**Observations:**

1. P & I diagram needs to be prepared & updated as and when any modification done.

**19 LIFTING MACHINES & TACKLE**

196	Whether all the lifting machines are marked with their S.W.L?	Yes
197	Are all the examinations and tests documented in the prescribed form?	Yes
198	Are all examinations and tests carried out and certified by competent person(s)? Give details.	Yes
199	Are adequate lifting tackles provided at all the places where it is required? Give details.	Yes
200	Are the trained operators engaged for operating the equipment? Give details.	Yes
201	What is the system of training such operators?	Yes (Through Induction Training)
202	Are all the lifting machines and tackles maintained in good conditions and record maintained?	Yes

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<b>20</b>	<b>MOBILE EQUIPMENT AND VEHICULAR TRAFFIC</b>
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203	Is all the mobile equipment in good condition?	NA
204	Are trained drivers engaged for fork-lift trucks?	NA
205	What is the system for identifying these drivers from other drivers?	NA
206	What system do you adopt to assess their standard of driving as poor / fair / satisfactory / good?	NA
207	Is there adequate number of warning signs / signals?	NA
208	Are the hazards associated with transportation within the plant identified and safety measures taken? Give details.	Yes

<b>21</b>	<b>ACCESS</b>
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209	Is adequate safe access provided to all places where worker needs to work?	Yes
210	Are all such access are in goods conditions?	Yes
211	Are portable access or platforms necessary? If yes,	
	i) Are these sufficient?	Yes
	ii) Are these regularly inspected?	Yes
	iii) Are these readily available?	Yes
	iv) Are these provided with toe-boards and railings?	Yes
212	Oiling and greasing points :	NA
	i) Are these located and extended to safe place clear of moving parts?	NA

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	ii) Are these easily accessible?	NA
	iii) Are these liable to drip in to walkways?	NA
	iv) Whether such workers were trained and whether they are provided with fit-tight clothing's and registers maintained?	NA
213	Are all drain covers in good condition and fitting flush?	Yes

<b>22 MATERIAL HANDLING</b>
-----------------------------

214	Are these adequate storage facilities available?	Yes
215	Are these areas clearly defined?	Yes
216	Are all racks and steel ages in good condition?	Yes
217	Have you adequate equipment for handling materials?	Yes
218	Do the workers know the hazards associated with manual material handling?	Yes
219	Where manual handling is necessary, are the workers been trained?	Yes
220	Do they practice this?	Yes
221	Do workers follow safe procedures for storage of materials?	Yes
222	Whether contractor workers are trained in safety?	Yes
223	What is the system for handing over plant to the maintenance department and receiving back?	Startup & Shutdown
224	Is the system consistently applied?	Yes
225	What is the system for the preventive and predictive maintenance and how do you ensure its effectiveness? Give details.	Through PM plan

**Observations:**

(127)

1. SOP for material handling need to display at material storage areas in local language.

<b>23</b>	<b>TANK STORAGE AREA</b>
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226	Whether it is a pressure vessel or not?	NA
227	Give storage vessel designation (exceeding threshold quantities specified in MSIHC, Rules-1989).	NA
228	Give the names of storage materials in each of them.	NA
229	What are the vessel sizes (Capacity in tones)?	NA
230	What is the material of construction for each vessels and what standards followed in designing / fabricating the vessels?	NA
231	What are the operating pressure and temperature?	NA
232	What are the vessels locations? (Please indicate on-site plan or plot plan)	NA
233	Indicate whether vessels are above ground / underground.	NA
234	If any of the tanks storing flammable materials, whether electrical installations are flame proof or not?	NA
235	Are these storage vessels bonded / dyked?	NA
236	If yes, what is the capacity of bunds / dykes?	NA
237	Are the vessels properly bonded and earthed and whether periodically checked and record maintained?	NA
238	How are vessels isolated in the event of a mishap?	NA
239	Are the vessels fitted with remotely controlled isolation valves?	NA

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240	Are vessels provided with emergency vent, relief valves, bursting disc, level indicator, pressure gauge, and overflow line?	NA
241	Where such do vents discharge?	NA
242	Are the vessels provided with alarms for high level, high pressure and high temperature?	NA
243	Are stand by empty tanks provided for emptying in case of emergency?	NA
244	What are the provisions made for firefighting / tackling emergency situations around the storage vessels?	NA
245	Has any consequence analysis been carried out for these vessels? (If yes, give details)	NA
246	What periodical testing's carried out on the vessels to find out the integrity of the vessels?	NA
247	Whether these tests are certified by the approved competent persons?	NA
248	Whether log sheets are filled up on daily basis for recording the parameters of these vessels?	NA

<b>24 GAS CYLINDERS STORAGE AREA</b>
--------------------------------------

249	What are the various gas cylinders in the plant? (Give details)	O <sub>2</sub> , N <sub>2</sub> , LPG and Acetylene
250	What are the storage facilities?	Stored in Shed
251	What are the measures taken for combating any emergency in the cylinder storage area?	No
252	Are valid licenses available for storing all these cylinders?	Yes

129

253	Whether integrity test certificates are obtained from the suppliers of the cylinders?	Yes
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**Observations:**

1. Gas cylinders shall be stored as per the legal condition even if license requirement is not there.
2. Proper stacking in upright position need to be done for Filled & empty both cylinders.
3. All cylinders shall be provided with cap for protection of safety valve when not in use.

**25 COMMUNICATION SYSTEM ADOPTED IN PLANT**

254	Are public address systems available in all plant areas?	Yes
255	Are Public address systems provided with uninterrupted power supply?	Battery operated
256	Whether public address system is checked periodically for its proper functioning?	Yes
257	Is there any hot line provided to fire station?	No
258	What is the means of communicating emergency in the plant?	Intercom, mobile

**26 TRANSPORTATION**

259	What potentially hazardous materials are transported to or from the site? (Including wastes)	Explosive & Flammable & toxic Material
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260	What mode of transport is used?	By truck / tempo approved by PESO & Transport department
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<b>27 ROAD</b>
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261	Does the company employ licensed vehicle of its own / outside sources?	Yes
262	Are the loading / unloading procedures on-site and safety precautions displayed?	Yes
263	Are loaded tankers or trucks parked in a specific area on-site?	Yes
264	Do all truck and tanker drivers carry TREM Card or instruction booklet?	Yes
265	Do all truck and tanker drivers get training in handling emergencies during transport?	Yes

**Observation:**

1. Training to security team need to be provided for proper monitoring and handling of flammable / Toxic/ Explosive material inside plant.

<b>28 RAIL</b>
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266	What hazardous materials are transported by rail?	NA
267	Does the company have a direct siding on-site?	NA
268	Are tankers or others wagons used in transportation?	NA

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## 29 PIPELINES

269	What materials are transported to and from the site by pipelines?	NA
270	Are the pipelines underground or over ground?	NA
271	Are corrosion protection measures employed in pipelines?	NA
272	Whether intermediate booster pumps are used?	NA
273	What are the maximum, minimum and average transfer rates?	NA
274	Are the pipelines extended in the public domain?	NA
275	Are the pipelines dedicated for each type of chemicals?	NA
276	Are the pipelines fitted with safety equipment such as leak detectors, automatic shut-off valves etc?	NA
277	What is the frequency and method of testing of the pipelines?	NA
278	Are there any written procedures for tackling leakages in pipelines?	NA

## ANNEXURE - I

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## List of Raw Materials with Maximum Storage Quantity

Sr. No.	Name of Chemical	Maximum Storage Quantity
1	AMMONIUM NITRATE	3500000 MT
3	SALT	58000 kgs
4	GUAR GUM	30000 kgs
5	SODIUM NITRATE	42000 kgs
6	PARAFIN WAX	48000 kgs
7	M.C.WAX	8000 kgs
9	MALEIC ANHYDRIDE	10000 kgs
10	CUPROUS CHLORIDE (C1)	250 kgs
11	PARA TOLUENE SULFONIC ACID (C2)	250 kgs
12	LAAAURIC ACID	3000 kgs
13	HOT MELT GLUE (ADHESIVE)	1200 kgs
14	THIOUREA	4500 kgs
15	CITRIC ACID	1500 kgs
16	ZINC CHROMATE	1500 kgs
17	SODIUM DI-CHROMATE	1000 kgs
18	A.P.T.	1500 kgs
19	S.H.M.P.	1000 kgs
20	RHODAMINE RED DYE	75 kgs
21	SULPHUR	200 MT
22	SUPER - 1 (MAP)	16000 kgs
23	SUPER - 2 (DAP)	16000 kgs
24	MAIZE STARCH POWDER	36000 kgs
28	ZINC OXIDE	5000 kgs
29	PENTA ERYTHRITOL	48000 kgs
30	DEXTRINE WHITE	250 kgs

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31	DI PENTA ERYTHRITOL	2000 kgs
32	TIN SOLDER	500 kgs
33	SODA ASH	60000 kgs

## ANNEXURE – II

## List of Finished Products with Maximum Storage Quantity

Sr. No.	Name of Finished Products	Maximum Storage Quantity
	Manufacturing License	
1	Cartidge slurry/Emulsion	124750 MT/yr
2	Bulk Slurry/emulsion	16500 MT/yr
3	Detonator	100 million/yr
4	Detonating Fuse	75 million mtrs./yr
5	PETN	1650 MT/yr
6	Cast Booster	1500 Mt/yr

	Use Magazine License	
1	Nitrate mixture	12.14MT
2	Cast booster	200kgs
3	Detonating fuse	100mtrs
4	HMX and compounded products	24900kgs
5	PETN /TNT	150kgs
6	Styphnic acid	8000 kgs
7	Hexa Nito stilbene	250 kgs
8	RDX and compounded products	1500 kgs
9	Shock tubes	10 lac meters
10	Fuse head for electric detonators	20 lac nos.
11	Delay element	3 lac nos.
12	TNT	50 MT

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13	Electric/Nonelectric detonators	4000 nos
14	Ordinary detonators/Filled shell	1740000 nos.

Sr. No.	Name of Finished Products	Maximum Storage Quantity
1	Ordinary/Electric/Non electric detonators	28 lac nos
2	Electric/Nonelectric detonators	25 lac nos
3	Nitrate mixture	396 MT
4	Detonating fuse	45 lac mtrs.
5	PETN	3000 kgs
6	Cast booster	40000 kgs
7	HMX and compounded products	6950 kgs
8	TNT	50 kgs
9	Safety fuse	1 lacs mtrs.
10	RDX and compounded products	2000 kgs

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**SECTION 9: STATUTORY APPROVALS**

Checked all Legal Documents there is regular follow up on the statutory compliance and well – maintained record. Over all there is commitment of management towards compliance to the statutory requirements is seen. The follow up system is satisfactory. Procedure for updating legal and statutory compliances is evident. Detailed Legal register is prepared along with summery of list of licenses.

Sr. No.	Particulars	Details
1	Name of Occupier	Mr. Milind Deshmukh
2	Name of Factory Manager	Mr. Purushottam P. Deotare
3	Name of Safety Officer (If Applicable)	
4	Name of Company Doctor (If Applicable)	Dr. Ashok Kasatwar (MBBS, AFIH)
5	Name of Welfare Officer (If Applicable)	Mr. Bipin Bihari Sing
6	Form 27 annual return	25.01.2021
7	Factory License Number	0217761 valid till 31.12.2021
8	Last plan approval from DISH	120500000025343 dated: 06/08/2021
9	Stability from Structural Engineer	71-2017-2595-601, Date. 22/05/217
10	Medical Health check	Dr. Varsha Potdar on dated: 18.08.2021
11	Pressure vessel & Lifting equipment's Testing Date & by Whom	
12	MPCB License	UAN No. – 0000119394, Consent No.:0000071891/O& A /18 <sup>th</sup> CAC-2001001969 dated 29/01/2010, valid till: 30/6/2021
13	Registration of Contractor	
14	Weights & Measures	
15	Fire Insurance/Fire NOC	
16	BCC date from MIDC	
17	Latest Electrical Engineer Approval	
18	Lift License (If Applicable)	
19	Sexual Harassment Committee Date of Declaration	
20	Gas Cylinder Storage License (If Applicable)	

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21	D G Set Approval from Electrical dept.	OEI 505002110202006564 dated 21.10.2020
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## SECTION 10: RECOMMENDATIONS

All recommendations are given in Section-8 of this audit report. The desired end result of a safety audit is the identification of primarily unrecognized hazards in the light of experience and early recognition of shortcomings in the areas such as the maintenance and testing of critical equipment.

The recommendations are to two types:

1. Improvement in the system's specified requirements and
2. More effective implementation of the specified.

Please follow all points given in clause 1.7 of this audit report and comply it immediately.

## SECTION 11: CONCLUSION

In pursuit of continued improvement, the systems have adequate ability to achieve the desired goals. The General Duties of the "Occupier" specified at Section 7-A of the Factories Act gives different obligations of the occupier. Effective management system needs to develop to ensure safety of all workers working at site.

The systems need to develop with additional thrust on regular inspections and emergency preparedness to achieve desired goals on safety & occupational health. Over all there is commitment of management towards compliance to the statutory requirements is seen and the follow up system need to develop.

Action on the safety audit report is important. The Audit compliance follow up team should be formed. Suggestions, recommendations made in the text of this report (summarized in executive summery) to be complied. There should be regular review of the implementation of Audit recommendations by top management.

## WORK ORDER

ANNEXURE-NO-

7



**SOLAR  
INDUSTRIES  
INDIA  
LIMITED**

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AMRAWATI ROAD, NAGPUR-440023, (M.H.) INDIA.  
PHONES : (+91)712 2561000, 2560010  
FAX : (+91)712 2560702  
E-mail : solar@solarindia.com

Work Order No. : 4500446808  
Date : 20.10.2023

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Recipient Address : KH NO 37-39 &  
78-83,BAZARGAON,TAH-KATOL CHAKDOH NAGPUR 440023  
MH IN  
Phone No. :07118-256656 Fax No. :07122560010.

GSTIN NO. : 27AACCS2132E1ZT  
CIN : L74999MH1995PLC085878  
PAN : AACCS2132E

Name & Address of Vendor :-

M D SAFETY CONSULTANTS PRIVATE LIMITED  
9/A VINAYAK NAGAR, HINGNA ROAD NAGPUR-440036 13 IN

Contact Person :

Contact No. : 9850300765 , 9881724840 ,  
Email Id. : mdsafetyconsultants@gmail.com

GSTIN No. : 27AAHCM5796M1ZL  
PAN No. : AAHCM5796M

Sr. No.	Item Description.	Item Code	Quantity	Unit	Rate / Unit	Amount in INR	
1	<p><b>PROFES. CHARGES FOR EXT.SAFETY AUDIT</b> 1 ) PROFES. CHARGES FOR EXT.SAFETY AUDIT 1.000 EA @ 200,000.00 FOR:SAFETY AUDIT</p> <p>1. Professional charges for External Safety Audit as per IS 14489 in compliance with The Maharashtra Factory Rule 1963 &amp; The Safety Audit Rule, 2014 &amp; CIMAH (Control of Industrial Major Accident Hazards) Rule 2003 at M/s Solar Industries India Limited, Village Chakdoh, Nagpur Terms &amp; Condition: 1. Review of legal compliances with respect to Maharashtra Factories Rule, Environment Act &amp; Rules, Maharashtra Fire Rules, Electricity Rules 2010 &amp; 1956 and other applicable rules. 2. Assessment of Safety Culture including Housekeeping, Safety Management System, PPE#s Management, Involvement of Employees, Training and Training Record for Safety. 3. Review of Risk Assessment Study, New Equipment Procurement Procedure, Employee Behavior, Involvement of Employees in Safety, On site emergency plan &amp; mock drill. 4. Injury Reporting Mechanism, Implementation CAPA for injury, Prevention planning &amp; Program. 5. Legal documents /records review including workplace monitoring, confined space entry. The complete audit scope as per IS standard 14489:2018 and The Maharashtra Safety Audit 2014</p> <p>SAC :   CGST 9.00 %   SGST 9.00 %   Delivery Dt: 30.10.2023   Sched. Qty: 1.000</p>		1.000	AU	200,000.00	200,000.00	
		Sub Total				200,000.00	
		Taxable Value				200,000.00	
		Total CGST				18,000.00	
		Total SGST				18,000.00	
		Total WO Value in INR Two Lakh Thirty Six Thousand Rupees Only					236,000.00

Commercial Terms & Conditions :-

Payment Terms : 0 days credit from the date of receipt/ dispatch

As Per Quotation No. & Date :

General Terms :

1. Material should be delivered along with Original for Recipient & Extra copy of Invoice, In absence of these documents material will not be accepted.
2. Quoting of our GSTN No. in tax invoice is mandatory. In case same is not mentioned in the invoice we will not be liable for payment of GST.
3. All invoices to have HSN code of the material being invoiced/service accounting code(SAC) of services being supplied. Without this supply/service invoice will not be accepted.
4. Disclaimer : Classification of Goods/Services under proper HSN/SAC code is your responsibility & we will not entertain any claim arising out of

Notes : Correspondence/Communication Address - SOLAR INDUSTRIES INDIA LIMITED,  
Solar House, Plot No 14, Kachimet, Amrawati Road, Wadi, Nagpur # 440023 (M.S.)  
In case of any difficulties contact - Phone No : 0712-6634567, 6634555

For SOLAR INDUSTRIES INDIA LIMITED

Authorised Signatory

Please mention our Purchase Order No. & Location in all your correspondence, invoice & Delivery Challans for prompt action.

Page 1 of 2

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**SOLAR  
INDUSTRIES  
INDIA  
LIMITED**

REGD OFFICE : "SOLAR" HOUSE, 14, KACHIMET,  
AMRAWATI ROAD, NAGPUR-440023, (M.S.) INDIA.  
PHONES : (+91)712-2561000, 2560010  
FAX : (+91)712-2560102  
E-mail : solar@solarworld.com

Work Order No. : 4500446808  
Date : 20.10.2023

any change by you at a later stage.

5. Time is essence of this order and delivery must be made as per delivery schedules unless otherwise differed by us in writing.
6. In the event, the supplier fails to deliver the goods of the ordered quality or deliver different and/or sub-standard make/quality, the Company reserves the right to reject the material and inform the supplier to lift the material from our stores at his own cost. Incoming freight, if any, paid for these shall also be recovered. Breakage/loss if any during transit due to poor packing or handling shall be to supplier's account.
7. Please ensure that your GST/PAN/CIN Nos. are mentioned on your invoices.
8. Test certificates / Certificates of analysis should accompany the goods as applicable.
9. ARBITRATION : All disputes of differences whatsoever arising between the parties out of or in relation to work/supply of work order/purchase order or effect to dis-contract or breach thereafter shall be settled amicably. However, if the parties are unable to solve them amicably, the same shall be finalized setting by arbitration and reconciliation. The award may in pursuance thereafter shall be final and binding on the parties. The venue of arbitration shall be Nagpur (India) and arbitration proceedings shall be conducted in English Language.
10. Subject to jurisdiction of court in Nagpur only.

Notes : Correspondence/Communication Address - SOLAR INDUSTRIES INDIA LIMITED,  
Solar House, Plot No 14, Kachimet, Amrawati Road, Wadi, Nagpur # 440023 (M.S.)  
In case of any difficulties contact - Phone No : 0712-6634567, 6634555

For SOLAR INDUSTRIES INDIA LIMITED

Authorised Signatory

Please mention our Purchase Order No. & Location in all your correspondence, invoice & Delivery Challans for prompt action.

Page 2 of 2

ANNEXURE No. B

for admin/confirm safety auditor schedule.php?schedule\_id=5988

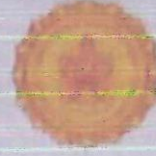
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महाराष्ट्र शासन | कायदा विभाग

Directorate of Industrial Safety & Health

औद्योगिक सुरक्षा व आरोग्य संचालनालय



+91 22 26572

dirdishmun

### Safety Audit

Name of Safety Auditor	MASE DNYANESH D
Name of Factory	SOLAR INDUSTRIES INDIA LIMITED
Permanent Serial Number (PSN) of Factory (To be obtained from Factory)	56696
Type of Factory	2CB
Number of Workers	2644
Factory Email	S.SHARMA@SOLARGROUP.COM
Address of Factory	CHAKDOH, AMRAVTI ROAD, KATOL, NAGPUR
District	NAGPUR
Taluka/Sub-location	KATOL
Pincode	440023
Name of Factory Manager / Occupier	MR. MILIND DESHMKH
Factory Manager / Occupier Mobile No	9822703942
Estimated Safety Audit Commencement Date	15-12-2023
Report Status	PENDING
Safety Audit Commencement Date	15-12-2023
Safety Audit Completion Date	dd-mm-yyyy

Back

VISITED

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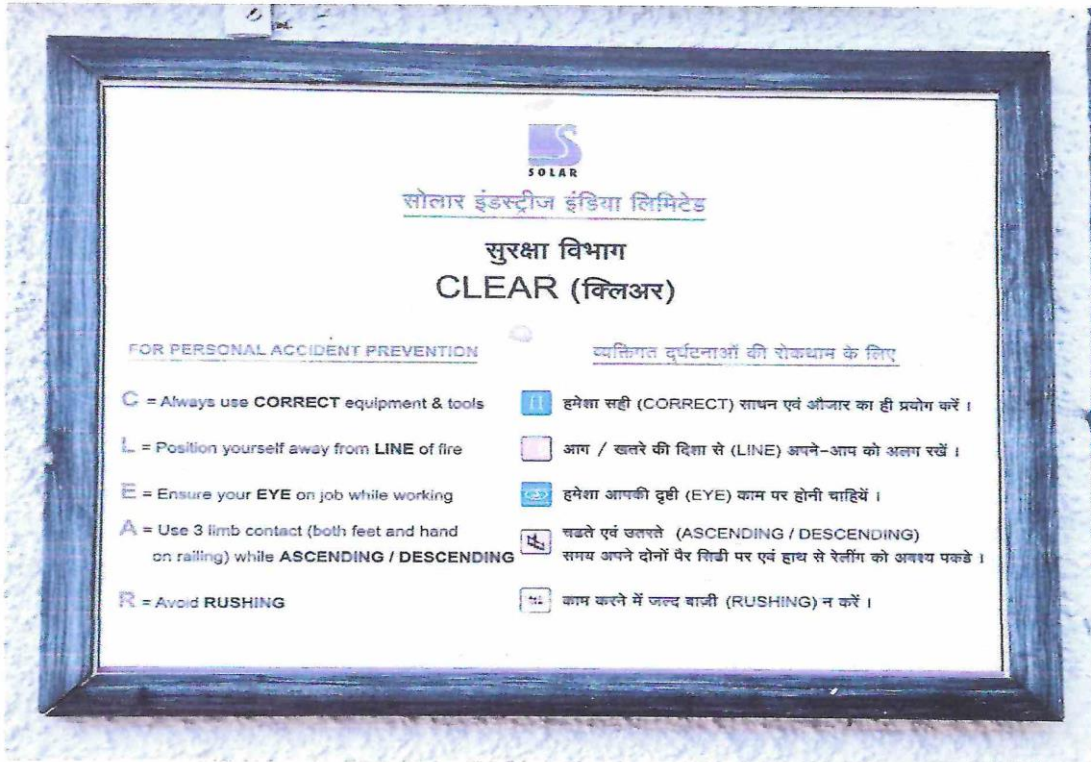


Fig: Safety Sign Boards depicted at workplace

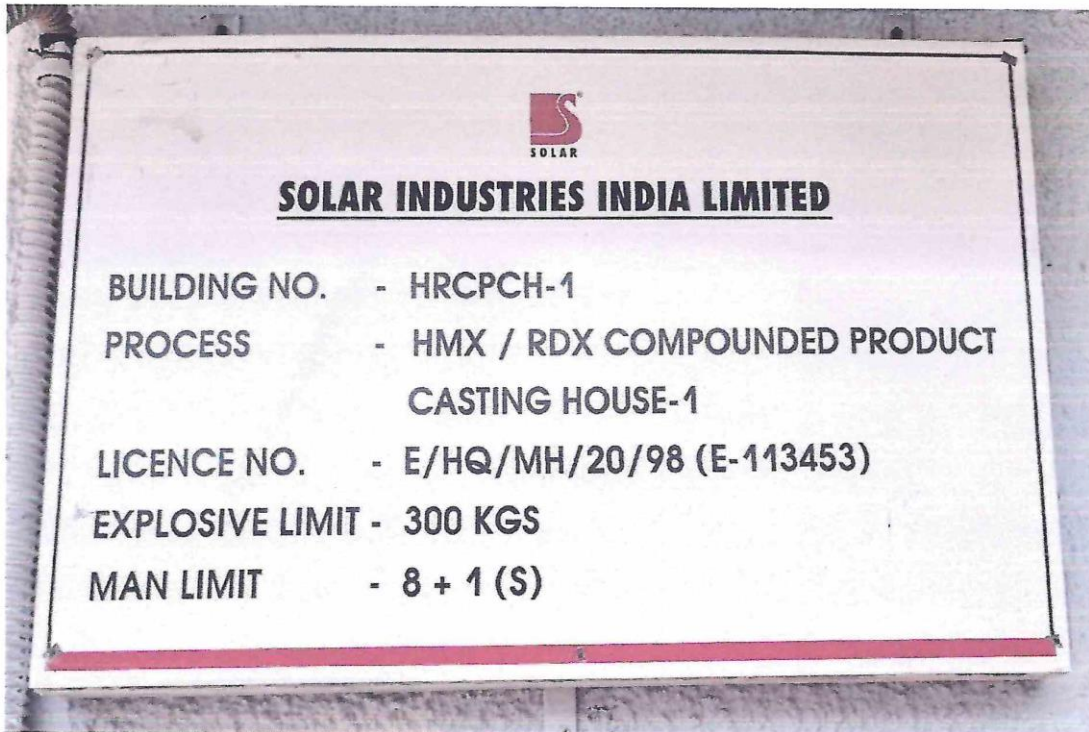


Fig: HR CPCH-1 Building Sign Boards showing Explosives Quantity &amp; Man Limit of the Plant

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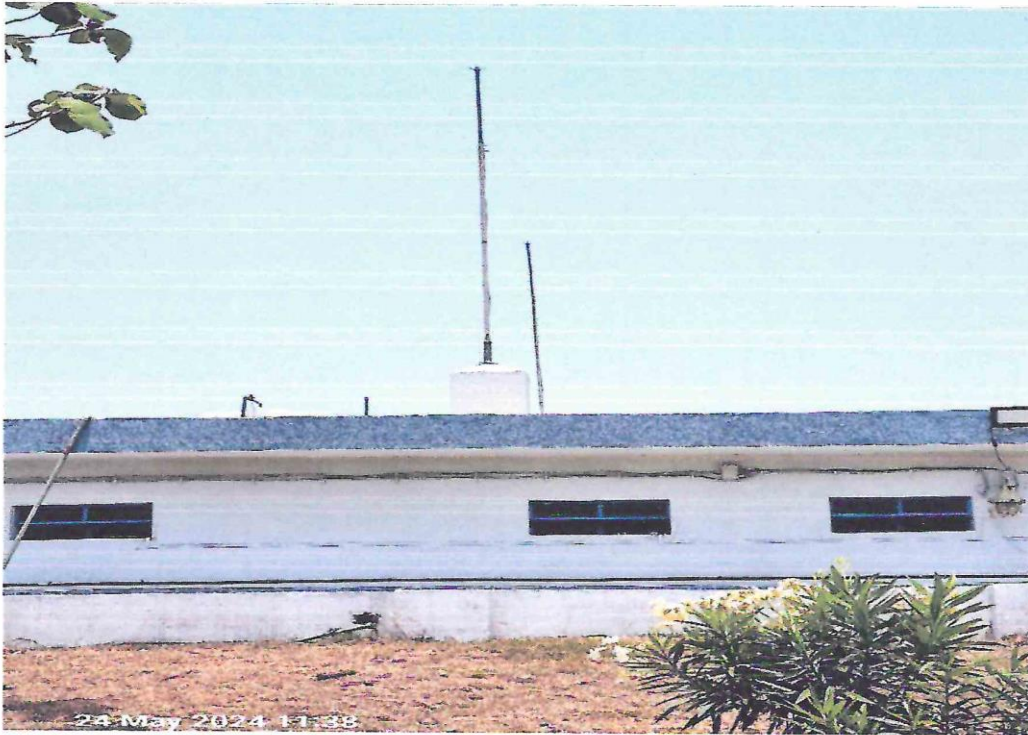
**PROVISION OF LIGHTNING CONDUCTORS, STATIC DISSIPATION AND EARTHING SYSTEM**

Fig: Lightening Conductor installed on the HRCPC Building as per IS 2309:1969

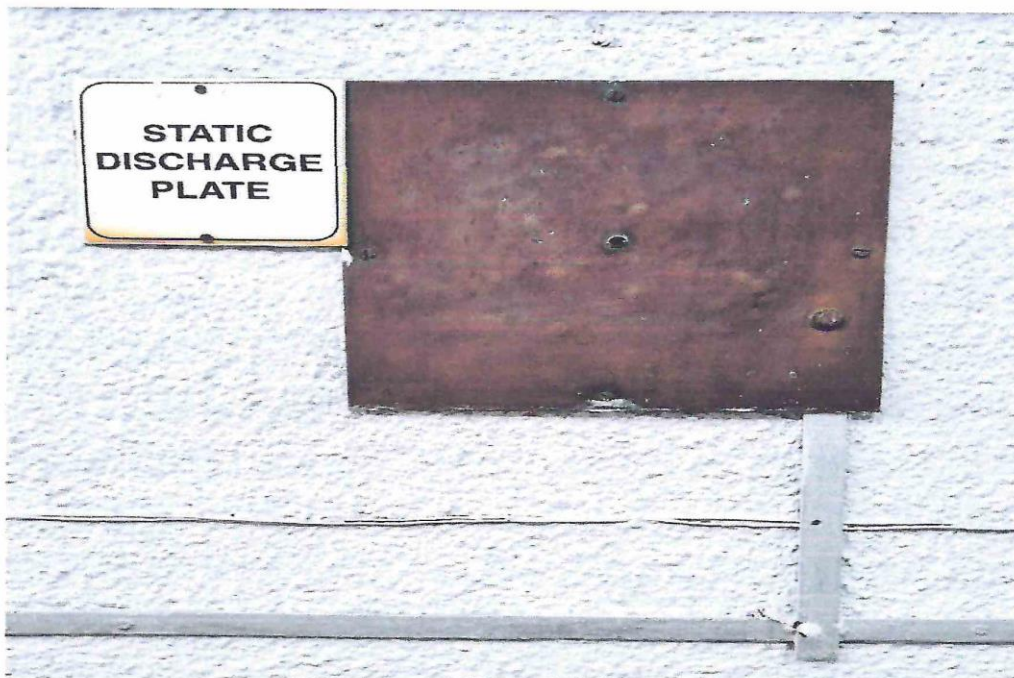


Fig: Body Static Discharge Plate installed at the Entrance Gate of Explosives manufacture Building

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Fig: Trays & Working tables duly Earthed & Connected to Earthing Pit



Fig: Earthing Pits and Fume Scrubbing System at HR CPCH Plant

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Fig: Fire Extinguisher provided at the manufacturing plant



Fig: Fire Bucket filled with sand & water provided at the manufacturing plant

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Fig: Signboard of Emergency Exit & Way to Assembly Point at the manufacturing plant



Fig: Emergency Stop Switch at the manufacturing plant



ANNEXURE No. 10

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# MANAGEMENT SYSTEM CERTIFICATE

Certificate no.:  
178024-2015-AQ-IND-RvA

Initial certification date:  
25 October 2002

Valid:  
14 May 2024 – 13 May 2027

This is to certify that the management system of

## Solar Industries India Limited

(Explosives Division), "Solar House", 14, Kachimet, Amaravati Road, Nagpur - 440023, Maharashtra, India

and the sites as mentioned in the appendix accompanying this certificate

has been found to conform to the Quality Management System standard:  
**ISO 9001:2015**

This certificate is valid for the following scope:

**Manufacture of shock tube, emulsion explosives, slurry explosives, site mixed emulsion explosives (SME), cast booster, penta-erythritol-tetra-nitrate (PETN), detonating fuse, detonators, HMX & HMX compounded products, RDX & RDX compounded products, sorbitan monooleate (SMO), polyisobutylene succinic anhydride (PIBSA), trinitrotoluene (TNT)**

Place and date:  
Barendrecht, 21 March 2024

For the issuing office:  
DNV - Business Assurance  
Zwoiseweg 1, 2994 LB Barendrecht,  
Netherlands



Erie Koek  
Management Representative

Lack of fulfillment of conditions as set out in the Certification Agreement may render this Certificate invalid.

ACCREDITED UNIT: DNV Business Assurance B.V., Zwoiseweg 1, 2994 LB, Barendrecht, Netherlands - TEL: +31(0)102922689. www.dnv.com/assurance



Certificate no.: 178024-2015-AQ-IND-RvA  
Place and date: Barendrecht, 21 March 2024

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## Appendix to Certificate

### Solar Industries India Limited

Locations included in the certification are as follows:

Site Name	Site Address	Site Scope
Solar Industries India Limited	(Explosives Division), "Solar House", 14, Kachimet, Amaravati Road, Nagpur - 440023, Maharashtra, India	Top management, marketing, purchase, training, MR
Solar Industries India Limited	(Explosives Division), Factory: Village Chakdoh (Bazargaon), Tehsil Katol, District Nagpur - 440023, Maharashtra, India	Manufacture of shock tube, emulsion explosives, slurry explosives, site mixed emulsion explosives (SME), cast booster, penta-erythritol-tetra-nitrate (PETN), detonating fuse, detonators, HMX & HMX compounded products, RDX & RDX compounded products, sorbitan monooleate (SMO), polyisobutylene succinic anhydride (PIBSA), trinitrotoluene (TNT)



ANNEXURE No. 11

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# MANAGEMENT SYSTEM CERTIFICATE

Certificate no.:  
133063-2013-AE-IND-RvA

Initial certification date:  
05 April 2010

Valid:  
05 April 2022 – 04 April 2025

This is to certify that the management system of

## Solar Industries India Limited (Explosives Division)

Village - Chakdoh (Bazargaon) Tehsil - Katol, Nagpur - 440 023, Maharashtra, India

has been found to conform to the Environmental Management System standard:  
**ISO 14001:2015**

This certificate is valid for the following scope:

**Manufacture of emulsion explosives, slurry explosives, site mixed emulsion explosives (SME), cast boosters, pentaerythritol tetranitrate (PETN), detonating fuses, detonators, HMX & HMX compounded products, RDX & RDX compounded products, sorbitan monooleate (SMO), polyisobutylene succinic anhydride (PIBSA), trinitrotoluene (TNT)**

Place and date:  
Chennai, 14 March 2022

For the issuing office:  
DNV - Business Assurance  
ROMA, No. 10, GST Road, Alandur, Chennai -  
600 016, India




Sivadasan Madiyath  
Management Representative

Lack of fulfilment of conditions as set out in the Certification Agreement may render this Certificate invalid.

ACCREDITED UNIT: DNV Business Assurance B.V., Zwolseweg 1, 2994 LB, Barendrecht, Netherlands - TEL: +31(0)102922689. www.dnv.com/assurance



ANNEXURE NO. 12

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# MANAGEMENT SYSTEM CERTIFICATE

Certificate no.:  
10000367955-MSC-RVA-IND

Initial certification date:  
05 April 2010  
(based on OHSAS 18001)

Valid:  
05 April 2022 – 04 April 2025

This is to certify that the management system of  
**Solar Industries India Limited (Explosives  
Division)**

Village - Chakdoh (Bazargaon) Tehsil - Katol, Nagpur - 440 023, Maharashtra, India

has been found to conform to the Occupational Health and Safety Management System standard:  
**ISO 45001:2018**

This certificate is valid for the following scope:

**Manufacture of emulsion explosives, slurry explosives, site mixed emulsion explosives (SME), cast boosters, pentaerythritol tetranitrate (PETN), detonating fuses, detonators, HMX & HMX compounded products, RDX & RDX compounded products, sorbitan monooleate (SMO), polyisobutylene succinic anhydride (PIBSA), trinitrotoluene (TNT)**

Place and date:  
Barendrecht, 14 March 2022

For the issuing office:  
**DO NOT USE DNV - Business Assurance**  
Zwolsseweg 1, 2994 LB Barendrecht,  
Netherlands



**Erie Koek**  
Management Representative

Lack of fulfilment of conditions as set out in the Certification Agreement may render this Certificate invalid.


ACCREDITED UNIT: DNV Business Assurance B.V., Zwolsseweg 1, 2994 LB, Barendrecht, Netherlands - TEL: +31(0)102922589. www.dnv.com/assurance

## CSR CONTRIBUTION OF SOLAR INDUSTRIES INDIA LIMITED FOR THE FY 2023-24

Sr. No.	Name of the CSR Project/ Activities	Amount Spent (in Crores)	Specified Sector
1	Contribution to "Madhav Netralaya" Eye Institute & Research Centre towards expansion of its Super Specialty Ophthalmic Centre.	1.43	
2	Contribution made to Dr. Abaji Thatte Seva Aur Anusandhan Sanstha" for providing low-cost medical services to cancer patients for economically backward sections of society.	4.00	Promoting healthcare Including preventive healthcare activities
3	Contribution to "Central India Institute of Medical Sciences (CIIMS)" for providing healthcare services to all classes of society	0.32	
4	Contribution to "Gorakshan Sabha" for animal welfare activates.	1.00	
5	Contribution to "Go-Vigyan Anusandhan Kendra" for animal welfare activities.	0.35	Animal Welfare
6	Contribution to "Pench Tiger Reserve Conservation Foundation" towards Wildlife protection	0.21	
7	Contribution to "Sahakar Bharti" for Empowering Women Entrepreneurs.	0.05	
8	Contribution towards Shri Krishna Das Jajoo Smarak Trust for supporting 'Widow and helpless women' to earn their livelihood.	0.21	Empowerment of Women and Skill Development
9	Contribution made to Shree Shivkrupanand Swami Foundation to initiate the foundation work of Shree Guru Shakti Dham, to start the Garbhagriha Construction, to start the Meditation Hall and Kalash, etc.	0.25	
10	Contribution to "Helplink Charitable trust" for promoting Education to underprivileged children	0.05	
11	Contribution to "Friends of Tribals Society" towards providing education to underprivileged children	0.02	Promoting Education
12	Contribution made towards the project of excavation and removal of Silt/Mud from a lake situated near Bazargaon.	0.50	Conservation Natural Resources & Rural Development
13	Contribution to "Goseva Parivar" for animal welfare activities.	0.05	
<b>Total</b>		<b>8.44</b>	

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ANNEXURE No. 14

 <b>Maharashtra Pollution Control Board</b> महाराष्ट्र प्रदूषण नियंत्रण मंडळ	<b>VISIT REPORT</b>	Doc. No :	QMS.P10_F01
		Rev. No :	00
		Rev. Date :	07/01/2021
Phone : 95712 -2560139 / 52 Fax : 95712 - 2560851 Email : sronagpur1@mpcb.gov.in	<b>Sub-Regional Office, Nagpur-I</b> <b>5 th Floor, Udyog Bhawan Civil lines, Nagpur</b>		

**General Information**

**Industry :- M/s SOLAR INDUSTRIES INDIA LTD,**

**Address :- KH. NO. 1,3,4,8,29-31,37-40,70-75,78,79,81-83,85,124,**  
 CHAKDOH, NEAR BAZARGAON, TAL-KATOL, DIST-NAGPUR.

**Zip code :- 441302**

**Industry Category: - Red**

**Select Category:- LSI**

**Visited On 5.10.2023**

Email Address of Unit :- s.sharma@solargroup.com  
 Industry representative: Dr.S.K. Sharma, Deputy General Manager.

**Consent Status :- Existing Consent Board has granted under RED/LSI category vide no. No. 1.0**  
 /BO/CAC/UAN No. 00000119394/CR-2201001112 dated-25.01.202 Valid up to 30/06/2026.

**Is consent obtained :Yes**

**Validity Of Consent up to : - 30/06/2026.**

I.E.	153 M3/Day	D.E.	99 M3/Day
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- Industry visited on 5.10.2023 w.r.t. Consent to Establish application for installation of stand by Boiler having capacity 20 TPH , proposed fuel Coal qty-3.136 MT/hrs and Biomass Briquettes qty-3.590 MT/hrs. Proposed Non Hazardous waste I.e Coal Ash qty-375 MT/M.
- APC:- proposed APC system bag filter attached to stack of height -36 Mtrs.
- Capital investment of Rs.16.66/- crores as per undertaking submitted by industry and consent to Establish fees paid of Rs.50,000/-
- Existing consent Board has granted under RED/LSI vide no. 1.0/CAC/UAN no.0000119394/CR-2201001112 dated-25.01.2022 valid up to -30.6.2026 with condition of 100 % recycle/reuse in the process to achieve ZLD. I.E- 153.0 CMD,D.E-99.0 CMD.
- Govt of India (MoEF) had issued EC on 7.06.2019.

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## 6) Details of Water consumption and effluent quantity :

Sr. No.	Purpose for Water Consumed	Proposed Water consumption quantity C to E (CMD)
1	Industrial Cooling, boiler feed	168.00CMD Boiler
	<b>Total</b>	19.2 CMD Boiler blow down recycle and refuse in again cooling purpose

7) ETP:- a) Main ETP having capacity 100 KLD for Emulsion, slurry, PETN, Cast booster, DF plants effluents are treated in ETP consisting of Collection tank, Neutralization tank, settling tank, aeration tank, RO plant, RO permeate storage tank, RO reject sent to MEE and distillate reuse in process.

B) Provided Separate Effluent treatment facilities unit wise. At Chemical Plant engaged in Lead Azide & Lead styphnate ETP of capacity of 15 KLD with Neutralisation- RO Plant – MEE.

C) ETP for TNT plant- having capacity 15 KLD consisting collection, neutralisation tank, settling tank, MEE.

D) HMX/RDX plant having capacity -70 KL generated effluent collected in collection tank, neutralisation tank, Settling tank, filtration cloth then 100% reuse in process.

8) During the visit Treated effluent is reused into process. industry has provided web camera with night vision capability in the ETP area. Inlet flow meter provided. Industry has provided on line pH meter, and flow meter as EC condition.

9) STP :- Industry has provided STP having capacity 150 KLD + 10 KLD total capacity 160 KLD. Treated effluent used for grading purpose.

10) APC:- Industry has provided Existing Boiler-03 no's having capacity 3 TPH, 6 TPH & 12 TPH. Having one Briquette/coal based TFH with cyclone dust collector followed by bag filter attached Stack of height 30 mtrs.

11) on line OCEMS at 12 TPH provided and connected to MPCB and CPCB server.

12) Industry has submitted Hazardous waste annual report form no-4 on 8.5.2023.

13) Environmental statement audit report submitted on 23.9.2023.

14) HW. Industry has sending ETP sludge category 35.3 qty-9.210 MT on 21.9.2023. E -Waste qty-433 kg sent vide dated -10.6.2023 to M/S Suritex Private Ltd works, B-11, MIDC ButiBori, Nagpur.

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- 15) Industry has provided continuous Ambient air quality monitoring stations -2 nos upward and down ward and connected to CPCB server.
- 16) Existing consented BG submitted 25/- lakhs towards O&M of PCS and compliance of consent & EC conditions.



(Dr.S.K.Sharma).  
Deputy General Manager.  
Solar Industries India Ltd,

Chakdoh Nagpur



( Pramod lone)  
Field Officer  
Sub-Regional office, Nagpur-1

- 1) Industry visited on 27.5.2023 w.r.t. Consent to Establish for expansion.
- 2) Existing consent Board has granted under RED/LSI vide no. 1.0/CAC/UAN no.0000119394/CR-2201001112 dated-25.01.2022 with condition of 100 % recycle/reuse in the process to achieve ZLD. I.E- 153.0 CMD, D.E-99.0 CMD, valid up to -30.6.2026.
- 3) Govt of India (MoEF) had issued EC on 7.06.2019.
- 4) Now applied for C to E for Expansion with increasing production quantity and new additional two product in the name 1) Shock tube (NONEL Tube) 2) Microchip ( For Detonator) for captive purpose only.

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**The details of Existing Production Quantity and Proposed Production Quantity and addition of two products :-**

5)

	Products Name	UOM	Industrial license Issued by DPIIT Capacity Per Annum	Existing MPCB Consented Quantity	Proposed Increased Production Quantity applied for C to E	Total Production Quantity after Expansion
1	Slurry/Emulsion Explosives (Finished)	MT/Yr.	200000	156250	43750	200000
2	Detonators	Million Nos./Yr.	150	125	25	150
3	Penta Erythritol Tetra Nitrate (PETN)	MT/Yr.	4500	3000	1500	4500
4	Detonating Fuse	Million Meters/Yr.	225	150	75	225
5	Pentolite Cast Booster	MT/Yr.	4500	3000	1500	4500
6	Calcium/Sodium Nitrate	MT/Yr.	Not Applicable	3600	6400	10000
7	GI/Cu Wire Coating	Million Nos./Yr.	Not Applicable	90	60	150
8	Filling/ Pressing of Filled Shells (Captive)	Million Nos./Yr.	Not Applicable	63	127	190
9	Lead Azide (Captive)	MT/Yr.	Not Applicable	9	6	15
10	ASA/AM/APA Mixing & Drying (Captive)	MT/Yr.	Not Applicable	12	6	18
11	Shock Tube /NONEL Tube (Captive & Finished)	Million Meters/Yr.	450	00	450	450
12	Microchip (Captive & Finished)	Million Nos./Yr.	Not Applicable	00	7.5	7.5

**6) Details of Water consumption and effluent quantity (Existing & Proposed):**

Sr. No.	Purpose for Water Consumed	Water consumption quantity Existing CTO (CMD)	Water consumption quantity Proposed (CMD)	Total Water Consumption Quantity Required (CMD)
1	Industrial Cooling, spraying in mine pits or boiler feed	548.00	347.00	895.00
2	Domestic Purpose	138.00	67.00	205.00
3	Processing whereby water gets polluted & Pollutants are easily biodegradable	216.00	97.00	313.00
4	Processing whereby water gets polluted & Pollutants are not easily biodegradable and are toxic	0.00	0.00	0.00
5	Gardening, Civil & other uses	95.00	108.00	203.00

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Total	997.00	619.00	1616
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7) Trade effluent and domestic effluent existing and proposed quantity .

Sr. No.	Description	Existing Permitted in CMD	Proposed C to E for expansion effluent generated qty in CMD	Total After Expansion CMD	Disposal Path
1	Trade Effluent	153	97	250	100% Recycled /reuse in process to achieve ZLD ( MEE provided )
2	Domestic Effluent	99	31	130	Treated in STP treated effluent using for gardening purpose.

7) Source of water consumption is Ground water , industry has obtained CGWA a NOC valid up to 18.4.2023 and now applied for renewal of NOC with increased water consumption quantity 1600 KLD.

8) ETP:- a) Main ETP having capacity 100 KLD for Emulsion,slurry,PETN, Cast booster,DF plants effluents are treated in ETP consisting of Collection tank, Neutralization tank,settling tank,aeration tank,RO plant, RO permeate storage tank, RO reject sent to MEE and distillate reuse in process. MEE distillate sample collected and sealed in presnce of undersigned industry representative.

B) Provided Separate Effluent treatment facilities unit wise. At Chemical Plant engaged in Lead Azide & Lead styphnate ETP of capacity of 15 KLD with Neutralisation- RO Plant – MEE.

C) ETP for TNT plant- having capacity 15 KLD consisting collection ,neutralisation tank,settling tank ,MEE.

D) HMX/RDX plant having capacity -70 KL generated effluent collected in collection tank ,neutralisation tank,Settling tank,filtration cloth then 100% reuse in process.

9) During the visit Treated effluent is reused into process. industry has provided web camera with night vision capability in the ETP area.Inlet flow meter provided.Industry has provided on line pH meter ,and flow meter as EC condition.

10) STP :- Industry has provided STP having capacity 150 KLD + 10 KLD total capacity 160 KLD.Treated effluent used for grading purpose.STP outlet JVS sample collected pH 7-8 and sealed in presence of undersigned industry representative.

11) APC:- Industry has provided Boiler-03 no's having capacity 3 TPH,6 TPH & 12 TPH . Having one Briquette/coal based TFH with cyclone dust collector followed by bag filter attached Stack of height 30 mtrs. 2TPH Boiler has been removed and industry informed to MPCB abide dated29.7.2022

12) on line OCEMS at 12 TPH provided and connected to MPCBand CPCB server.

13) Industry has proposed new 20 TPH Boiler ,fuel coal and Agrowaste. (Briquette )

14) Details of Fuel Consumption for Proposed Boiler and APC given below:-

Source	Fuel Type	Fuel Consumption Kg/ Hr.	Fuel Consumption Tonne/day	Calorific value Kcal/kg	Sulphur Content %	Ash Content %	Emission SPM mg/Nm3	Stack Dia mm	Stack Height Mts.
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(156)

Boiler-20 TPH	Indian Coal or	3136	75.26	4200	1 Max.	10-20	<115 (APC-Bag filter)	1200 mm	36
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15) Details of proposed Process stack is given below:-

Process Vent	No. of Stack	Stack Details						APC Control Equipment	Emission Gases
		MOC	Stack Dia mm	Stack Height Mts.	Shape	Gas Qty. NM3/hr	Temp. deg C		
PETN Plant	1	PVC	100	11	Round	250	35	Scrubber	NOx
CNA Tank Form	1	PVC	150	11	Round	150	30	Scrubber	NOx
Cast Booster Plant	2	PVC	100	11	Round	150	40	Scrubber	Acid Mist

16) DG set proposed 03 numbers is given below:-

DG set Vent	Fuel Type	Fuel Consumption Kg/ Hr.	Fuel Consumption Tonne/day	Calorific value Kcal/kg	Sulphur Content %	Ash Content %	Emission SPM mg/Nm3	Stack Dia mm	Stack Height Mts.
DG Set 250 KVA	HSD	150 Ltr./Hr.	3.6	4500	<0.05	1 Max	<100	150	4
DG Set 500 KVA	HSD	125 Ltr./Hr.	3.0	4500	<0.05	1 Max	<100	150	8
DG Set 600 KVA	HSD	75 Ltr./Hr.	1.8	4500	<0.05	1 Max	<100	150	8

17) Proposed DG set stack of height 8 Mtrs.

18) Hazardous Wastes: Existing and proposed is given below:-

Sr. No.	Category No./Type	UOM	Quantity Existing consented	Proposed C to E	Total qty after Expansion	Treatment	Disposal
1	35.3: Chemical sludge from wastewater	MT/A	155	5	160	Landfill after treatment	CHWTSDF
2	33.1: Empty Barrel/ containers / liners/ contaminated with hazardous chemicals/ waste	MT/A	50	35	85	Reconditioning	Sale to authorised Party
3	37.2: Ash from incinerator and flue gas residue	MT/A	160	30	190	Landfill after treatment	CHWTSDF

19) Other Hazardous Waste: Industry has generated proposed other waste is given below:-

Description	Quantity Disposed (MT)	Party to Whom Disposed
Electronic Waste	2.5	Sale to authorized party
Battery Scrap	1.5	Sale to authorized party
PVC Scrap	500	Authorized Recyclers

20) Proposed Non- hazardous solid waste

Sr. No.	Type of Waste	UOM	Quantity Existing	Proposed C to E for expansion	Total qty after Expansion	Disposal Path
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1	Fly Ash	MT/Month	575	375	950MT/M	Sale to Brick Manufacturer
2	Biological sludge/ Canteen waste	MT/Month	2.1	2.5	4.6 MT/M	Use as manure

- 21) Industry has submitted Hazardous waste annual report form no-4 on 8.5.2023.n
- 22) HW. Industry has sending ETP sludge category 35.3 qty-10.140 MT on 24.4.2023.
- 23) Industry has submitted form no-5 for the year 2022 on 28.9.2022
- 24) Details about use of hazardous waste : Industry has generated week nitric acid qty – 350 MT/M from PETN plant and reused for captive purpose for producing calcium nitrate and sodium nitrate which are raw material for emulsion and slurry explosives.
- 25) Burning pit :- Industry has provided scrubber at burning station.
- 26) Industry has provided continuous Ambient air quality monitoring stations -2 nos upward and down ward during the visit reading is pm -10 1.50 microgram, PM 2.5 , 1.40 microgram , NOx -0.10 miligram and connected to CPCB server.
- 27) BG submitted 25/- lakhs towards O&M of PCS and compliance of consent & EC conditions.

- 1) Industry visited on 27.5.2023 w.r.t. Consent to Establish for expansion.
- 2) Existing consent Board has granted under RED/LSI vide no. 1.0/CAC/UAN no.0000119394/CR-2201001112 dated-25.01.2022 with condition of 100 % recycle/reuse in the process to achieve ZLD. I.E- 153.0 CMD, D.E-99.0 CMD, valid up to -30.6.2026.
- 3) Govt of India (MoEF) had issued EC on 7.06.2019.
- 4) Now applied for C to E for Expansion with increasing production quantity and new additional two product in the name 1) Shock tube (NONEL Tube) 2) Microchip ( For Detonator) for captive purpose only.

**The details of Existing Production Quantity and Proposed Production Quantity and addition of two products :-**

- 5) Detailed production. Details is enclosed in anneure.
- 6) Details of Water consumption and effluent quantity (Existing & Proposed):
  
- 8) Trade effluent and domestic effluent existing and proposed quantity .  
Proposed Trade effluent qty- 97.0 CMD.(ZLD) , D.E generated qty-31.0 CMD.
  
- 7) Source of water consumption is Ground water , industry has obtained CGWA a NOC valid up to 18.4.2023 and now applied for renewal of NOC with increased water consumption quantity 1600 KLD.
  
- 8) ETP:- a) Main ETP having capacity 100 KLD for Emulsion,slurry,PETN, Cast booster,DF plants effluents are treated in ETP consisting of Collection tank, Neutralization tank,settling tank,aeration tank,RO plant, RO permeate storage tank, RO reject sent to MEE and distillate reuse in process. MEE distillate sample collected and sealed in presnce of undersigned industry representative.  
  
B) Provided Separate Effluent treatment facilities unit wise. At Chemical Plant engaged in Lead Azide & Lead styphnate ETP of capacity of 15 KLD with Neutralisation- RO Plant – MEE.  
  
C) ETP for TNT plant- having capacity 15 KLD consisting collection ,neutralisation tank,settling tank ,MEE.  
  
D) HMX/RDX plant having capacity -70 KL generated effluent collected in collection tank ,neutralisation tank,Settling tank,filtration cloth then 100% reuse in process.
- 9) During the visit Treated effluent is reused into process. industry has provided web camera with night vision capability in the ETP area.Inlet flow meter provided.Industry has provided on line pH meter ,and flow meter as EC condition.
- 10) STP :- Industry has provided STP having capacity 150 KLD + 10 KLD total capacity 160 KLD.Treated effluent used for grading purpose.STP outlet JVS sample collected pH 7-8 and sealed in presence of undersigned industry representative.
- 11) APC:- Industry has provided Boiler-03 no's having capacity 3 TPH,6 TPH & 12 TPH . Having one Briquette/coal based TFH with cyclone dust collector followed by bag filter attached Stack of height 30 mtrs. 2TPH Boiler has been removed and industry informed to MPCB abide dated29.7.2022
- 12) on line OCEMS at 12 TPH provided and connected to MPCBand CPCB server.
- 13) Industry has proposed new 20 TPH Boiler ,fuel coal and Agrowaste. (Briquette )
- 14) Details of Fuel Consumption for Proposed Boiler and APC given below:-
  
- 15) *Details of proposed Process stack is given below:-Detailed table is enclosed in Annexure.*
- 16) *DG set proposed 03 numbers Is given below:-Detailed table annexure*
- 17) *Proposed DG set stack of height 8 Mtrs.*
  
- 18) Hazardous Wastes: Existing and proposed is given below:-Hardoi waste disposal record is uploaded MPCB document.

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- 19) Other Hazardous Waste: Industry has generated proposed other waste is given below:-Enclosed Tabale
- 20) Proposed Non- hazardous solid waste . Non HW waste generated , 1) Fly ash after expansion qty -575 MT/M 2) Biological sludge qty-2.5MT/M.
- 21) Industry has submitted Hazardous waste annual report form no-4 on 8.5.2023.
- 22) HW. Industry has sending ETP sludge category 35.3 qty-10.140 MT on 24.4.2023.
- 23) Industry has submitted form no-5 for the year 2022 on 28.9.2022
- 24) Details about use of hazardous waste : Industry has generated week nitric acid qty – 350 MT/M from PETN plant and reused for captive purpose for producing calcium nitrate and sodium nitrate which are raw material for emulsion and slurry explosives.
- 25) Burning pit :- Industry has provided scrubber at burning station.
- 26) Industry has provided continuous Ambient air quality monitoring stations -2 nos upward and down ward during the visit reading is pm -10 1.50 microgram, PM 2.5 , 1.40 microgram , NOx -0.10 miligram and connected to CPCB server.
- 27) BG submitted 25/- lakhs towards O&M of PCS and compliance of consent & EC conditions.

# OPERATING MANUAL

**HMX / RDX Compounded Product  
Pellet casting house**

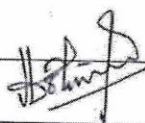
**( HRCPCH- 1 & 2 )**



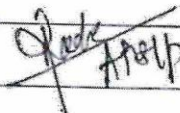
**SOLAR INDUSTRIES INDIA LIMITED**


**CHAKDOH, NAGPUR - 440023**

APPROVED BY



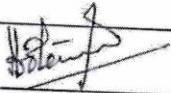
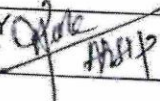
ISSUED BY



 <b>SOLAR INDUSTRIES INDIA LIMITED, NAGPUR</b>	<b>OPERATING MANUAL HMX / RDX COMPOUNDED PRODUCT PELLET CASTING HOUSE (HRCPC -1&amp; 2)</b>	<b>REFERENCE: ISP/8/PRD/10</b> <b>REVISION No. : 03</b> <b>REVISION DATE: 06/09/2021</b> <b>PAGE : 1 OF 1</b>
<b>TITLE</b>	<b>WORK INSTRUCTION: TNT SIEVING AND BOX PACKING</b>	

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1. Receive TNT batch with details from PP18 shift supervisor.
2. Unload 10 boxes/crate & keep in packing or store room.
3. Check the physical condition of the sieve for sharp edges, burs and blocked holes.
4. Ensure that crocodile clip is connected to the sieving table.
5. Before starting sieving ensure that scrubbing unit is in running condition and water tank level is checked by level tube.
6. Ensure operators are wearing safety goggles, cartridge mask/ dust mask, Safety shoes and Nitrile hand gloves.
7. Place the empty crate with one anti static liner below the sieving table.
8. Open TNT crate/box & place the liner containing TNT over the sieving table and slowly pour TNT over the mesh.
9. Start TNT sieving by slowly moving TNT flakes over the mesh, so that required flakes will pass through and oversize will retain.
10. Collect the under size material in crate with antistatic liner.
11. Check weighing balance by putting 20.0 kg weight for any error.
12. Keep the empty box on weighing balance, measure the weight of the empty box with liners and note it in sheet.
13. Collect oversize material in empty crate/box and send for burning along with PP-18.
14. Keep the sieved TNT along with anti static liner inside corrugated box in which two anti static liner should be present.
15. Check the Net weight of TNT box should be 20.0 kg and Gross weight should be 21.40 kg.
16. Take samples from random box then make composite sample and send for lab analysis.
17. Start closing of 1st antistatic liner containing TNT with plastic cable tie (200 mm x 3.6 mm) and bend the liner mouth one side and same was applicable for 2<sup>nd</sup> antistatic liner.
18. Same procedure applicable for 3<sup>rd</sup> antistatic liner having mouth one side closed with BOPP tape.
19. Then apply Solar printed tape on antistatic liner.
20. Put Do's & Don'ts pamphlets in each box.
21. Apply transparent BOPP tape on box from top side then apply Solar, printed tape.
22. Apply barcode on box properly.
23. UN no. to be stamped on left side above bar code.
24. Do PP strapping (15mm) with the help of strapping machine.
25. After strapping, batch to be loaded in explosive van & send to sale magazine.

<b>APPROVED BY</b> 	<b>ISSUED BY</b> 
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ANNEXURE No. 16

SPEED POST

GOVERNMENT OF INDIA  
 MINISTRY OF COMMERCE & INDUSTRY  
 PETROLEUM AND EXPLOSIVES SAFETY ORGANISATION (PESO)  
 (Formerly Department of Explosives)  
 Departmental Testing Station, 18 Km Stone,  
 Amraoti Road, Gondkhairi, Nagpur 440023  
 Tele: 280374  
 Email: dyccedts@explosives.gov.in

No: E/HQ/MH/20/98(E113453)

Dated: 18/12/2023

To,  
 M/s. Solar Industries India Limited,  
 Solar House, 14, Kachimet, Amravati Road, Nagpur., Nagpur  
 Distt. NAGPUR, State. Maharashtra, Pincode-440023

Subject: Manufacturing of HMX/HMX Compounded Products - Defence, RDX/RDX Compounded Products - Defence situated at Survey No.: 75, 78, 79, 81, 82, 83, 39, 40, 71, 38, 1, 3, 8/1, 8/2, 31, 37, 70, 72, 73/1, 73/2, 74 & 85 of Chakdoh and 29/1, 29/2 of Bazargaon, Village/Town. Chakdoh & Bazargaon, Distt. NAGPUR, State. Maharashtra Licence No. E/HQ/MH/20/98 (E113453) granted in Form LE-1 of Explosives Rules, 2008- Suspension regarding.

Sir,

An accident involving explosion occurred in the building number HR-CPCH-2 (HMX / RDX Compounded Pellet Casting House-2) marked as CBH-2 at accident site of the subject premises.

During the visit at the site by the officers of this office on 17/12/2023 and 18/12/2023, it was observed that the entire building number HR-CPCH-2 (HMX / RDX Compounded Pellet Casting House-2) marked as CBH-2 was completely collapsed in the accident and debris was found scattered in the surrounding area up to a distance of approximately 500 meters. Further, unexploded explosives were also recovered from the accident site.

Special precautions to avoid accident were not taken – Violation of Rule 19 of the Explosives Rules, 2008.

As such the subject site is no more suitable for manufacture / storage of explosives.

In view of above, the license number E/HQ/MH/20/98 (E113453) is hereby suspended as per the provisions of Section 6(E) of Explosives Act, 1884 and Rule 118 of Explosives Rules, 2008, with immediate effect as an interim measure in the interest of safety. An order suspending the licence is enclosed herewith.

Please show cause within 21 days of the date of this letter as to why the subject license should not be cancelled.

Without prejudice to any action which may be taken against you, you are advised to submit

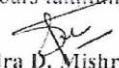
your internal investigation report including Panchanama, Post Mortem Report, Sample / Forensic Test Report, Process Description, recent Safety Audit, CCTV Camera footage for the previous day of accident and of the day of the accident.

Please comply the order and follow the procedure under Rule 119 of the Explosives Rules, 2008 regarding the disposal of the explosives in your possession. Please follow the procedure under Rule 121 for appeal.

Receipt of this letter may please be acknowledged.

Enclosures :

Yours faithfully,

  
Shivchandra D. Mishra  
Controller of Explosives  
Deputy Chief Controller of Explosives  
DTS, Gondkhairi, Nagpur

Copy  
Forwarded to:

1. District Magistrate, NAGPUR, Maharashtra for further necessary action.
2. Superintendent of Police, NAGPUR, Maharashtra for further necessary action.

Deputy Chief Controller of Explosives  
DTS, Gondkhairi, Nagpur

[For more information regarding status, fees and other details, please visit our web site <http://peso.gov.in>]

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GOVERNMENT OF INDIA  
MINISTRY OF COMMERCE & INDUSTRY  
PETROLEUM AND EXPLOSIVES SAFETY ORGANISATION(PESO)  
(Formerly Department of Explosives)  
Departmental Testing Station, 18 Km Stone,  
Amraoti Road, Gondkhairi, Nagpur 440023  
Tele: 280374  
Email: dyccedts@explosives.gov.in

No: E/HQ/MH/20/98(E113453)

Dated : 18/12/2023

**ORDER**

In exercise of the powers conferred under Section 6E (3) of the Explosive Act, 1884, read with Rule 118 of the Explosives Rules, 2008; Licence No. E/HQ/MH/20/98(E113453) granted in Form LE-1 under Explosives Rules, 2008 to M/s. Solar Industries India Limited (Occupier : Shri Milind Deshmukh), Solar House, 14, Kachimet, Amravati Road, Nagpur., Distt. NAGPUR, State. Maharashtra, Pincode-440023 for Manufacturing HMX/HMX Compunded Products - Defence,RDX/RDX Compunded Products - Defence from their HMX/HMX Compunded Products - Defence.RDX/RDX Compunded Products - Defence manufacturing factory situated at Survey No.:75, 78, 79, 81, 82, 83, 39, 40, 71, 38, 1, 3, 8/1, 8/2, 31, 37, 70, 72, 73/1, 73/2, 74 & 85 of Chakdoh and 29/1, 29/2 of Bazargaon, Chakdoh & Bazargaon, NAGPUR, Maharashtra is suspended with immediate effect.

M/s. Solar Industries India Limited is directed to surrender their Original copy of above licence in the office of this office immediately as required under Section 6E (9) of the Explosive Act, 1884.

Shivchandra D. Mishra  
Controller of Explosives  
Deputy Chief Controller of Explosives  
DTS, Gondkhairi, Nagpur

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ANNEXURE NO. 17

GOVERNMENT OF INDIA  
 MINISTRY OF COMMERCE & INDUSTRY  
 PETROLEUM AND EXPLOSIVES SAFETY ORGANISATION(PESO)  
 (Formerly Department of Explosives)  
 Departmental Testing Station, 18 Km Stone,  
 Amraoti Road, Gondkhairi, Nagpur 440023  
 Tele: 280374  
 Email: dyccedts@explosives.gov.in

No: E/HQ/MH/20/90(E89848)

Dated : 20/12/2023

To,

M/s. Solar Industries India Limited,  
 Solar House, 14, Kachimet, Amravati Road, Nagpur., Nagpur  
 Distt. NAGPUR, State. Maharashtra, Pincode-440023

21 DEC 2023

Subject: Manufacturing of TNT situated at Survey No.:75, 78, 79, 81, 82, 83, 39, 40, 71, 38, 1, 3, 8/1, 8/2, 31, 37, 70, 72, 73/1, 73/2, 74 & 85 of Chakdoh and 29/1, 29/2 of Bazargaon, Village/Town. Chakdoh & Bazargaon, Distt. NAGPUR, State. Maharashtra Licence No. E/HQ/MH/20/90(E89848) granted in Form LE-1 of Explosives Rules, 2008- Suspension regarding.

Sir,

Reference No NIL dated 20/12/2023.

An accident involving explosion occurred in the building number HR-CPCH-2 (HMX / RDX Compounded Pellet Casting House-2) which is situated near the subject TNT manufacturing building.

It was observed that the entire building number HR-CPCH-2 (HMX / RDX Compounded Pellet Casting House-2) marked as CBH-2 was completely collapsed in the accident and debris was found scattered in the surrounding area up to a distance of approximately 500 meters including subject TNT manufacturing building. Further, unexploded explosives were also recovered from the accident site. As such the subject site is no more suitable for manufacture / storage of TNT.

In view of above, the license number E/HQ/MH/20/90 (E89848) is hereby suspended as per the provisions of Section 6(E) of Explosives Act, 1884 and Rule 118 of Explosives Rules, 2008, with immediate effect as an interim measure in the interest of safety. An order suspending the licence is enclosed herewith.

Please show cause within 21 days of the date of this letter as to why the subject license should not be cancelled.

Without prejudice to any action which may be taken against you, you are advised to submit stock of the raw material for manufacturing of TNT, semi finished product and finished product along with recent Safety Audit, CCTV Camera footage for the previous day of accident and of the day of the accident.

Please comply the order and follow the procedure under Rule 119 of the Explosives Rules, 2008 regarding the disposal of the explosives in your possession. Please follow the procedure under Rule 121 for appeal.

In view of the above the subject licence granted to you is suspended as per the provisions of Section 6(E) of Explosives Act, 1884 and Rule 118 of Explosives Rules, 2008, with immediate effect. An order suspending the licence is enclosed herewith.

Please show cause within 21 days from the date of this letter as to why the subject licenses should



GOVERNMENT OF INDIA  
MINISTRY OF COMMERCE & INDUSTRY  
PETROLEUM AND EXPLOSIVES SAFETY ORGANISATION(PESO)  
(Formerly Department of Explosives)  
Departmental Testing Station, 18 Km Stone,  
Amraoti Road, Gondkhairi, Nagpur 440023  
Tele: 280374  
Email: dyccedts@explosives.gov.in


No: E/HQ/MH/20/90(E89848)

Dated : 20/12/2023

**ORDER**

In exercise of the powers conferred under Section 6E (3) of the Explosive Act, 1884, read with Rule 118 of the Explosives Rules, 2008; Licence No. E/HQ/MH/20/90(E89848) granted in Form LE-1 under Explosives Rules, 2008 to M/s. Solar Industries India Limited (Occupier : Shri Milind Deshmukh), Solar House, 14, Kachimet, Amravati Road, Nagpur., Distt. NAGPUR, State. Maharashtra, Pincode-440023 for Manufacturing TNT from their TNT manufacturing factory situated at Survey No.:75, 78, 79, 81, 82, 83, 39, 40, 71, 38, 1, 3, 8/1, 8/2, 31, 37, 70, 72, 73/1, 73/2,74 & 85 of Chakdoh and 29/1, 29/2 of Bazargaon, Chakdoh & Bazargaon, NAGPUR, Maharashtra is suspended with immediate effect.

M/s. Solar Industries India Limited is directed to surrender their Original copy of above licence in the office of **this office** immediately as required under Section 6E (9) of the Explosive Act, 1884.

  
Shivchandra D. Mishra  
Controller of Explosives  
Deputy Chief Controller of Explosives  
DTS, Gondkhairi, Nagpur

ANNEXURE No. 18

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Safety • Quality • Reliability

Ref: SIIL/NAPES &amp; TS/2023-24/51

Date 30.01.2024

To,

The Dy. Chief Controller of Explosives,  
Petroleum and Explosives Safety Organisation  
National Academy of Petroleum and Explosives Safety & Testing Station,  
18 Km Stone, Amravati Road, Gondkhairy,  
Nagpur-440023 (M.S.)

**Subject: Manufacturing of HMX/HMX Compounded Products - Defence and RDX/RDX Compounded Products - Defence situated at Survey No. 75, 78, 79, 81, 82, 83, 39, 40, 71, 38, 1, 3, 8/1, 8/2, 31, 37, 70, 72, 73/1, 73/2, 74 & 85 of Chakdoh and 29/1, 29/2 of Bazargaon, Village/Town Chakdoh & Bazargaon Dist. Nagpur state Maharashtra Licence No. E/HQ/MH/20/98(E113453), granted in Form LE- 1 of Explosives Rules,2008 - Delicensing of building No. HR-CPCH-2 and Revocation of suspension order regarding.**

Ref.1. NAPES & TS letter no. E/HQ/MH/20/98(E113453) dated 18.12.2023 & 20.12.2023.

2. Our letter no. SIIL/CCE Office/2023-24/07 dated 05.01.2024 and SIIL/CCE Office/2023-24/23 dated 09.01.2024.

Dear Sir,

This is in continuation of our reply submitted to the office of Chief Controller of Explosives Nagpur under information to your good office for Delicensing of building No. HR-CPCH-2 covered under licence no. E/HQ/MH/20/98(E113453).

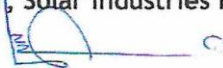
In addition to the Stability Certificate carried out by DUSCON CIVIL ENGINEERING SERVICES LLP (Chartered Civil Engineer) we have conducted in-house inspection of the mechanical equipment & pipeline installations, electrical equipment, and ensured the integrity of all the process instruments. It is confirmed that stability and fitness of the above-mentioned items is found suitable to use as part of the manufacturing process.

We will be very much obliged to consider necessary action towards the De-licencing of building No. HR-CPCH-2 and revocation of the suspension order.

All the provisions of the Explosives Act and Rules and conditions stipulated by PESO shall be followed.

Thanking You,

For, Solar Industries India Limited

  
S.L. Mundhada  
Sr. General Manager

Copy: The Chief Controller of Explosives, Nagpur.

**Solar Industries India Limited**

Regd. Office: "Solar" House, 14, Kachimet, Amravati Road, Nagpur - 440023, INDIA

☎ (+91)712-6634555/567 ☎ (+91) 712-6634578 ✉ solar@solargroup.com

CIN : L74999MH1995PLC085878 🌐 www.solargroup.com

**DUSON**

CIVIL ENGINEERING SERVICES LLP

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Form No-1 A  
(Rule: - 3A)  
Certificate of stability

Name of Factory : Solar Industries India Ltd  
 Village Town and district Which the factory is situated : Village Chakdoh, Near Bazargaon District Nagpur  
 Full postal Address of the factory : Solar Industries India Ltd Near Bazargaon, Tah. Katol District Nagpur  
 Name of the occupier : Sri Milind B. Deshmukh  
 Name of Manufacturing : Explosives and Explosive Accessories Process to be carried on in the factory

I certify that I have inspected the premises, the plant of which has been reviewed and examined the various parts including the foundation with special reference to the machinery plant etc that have been installed.

I am of the opinion that all the works of engineering, construction in the Premises is/are structurally sound and that it's their stability will not be Endangered by its/their use as a factory part of factory or manufacture Of industrial Explosive for which the machinery plant etc. Installed are Intended.

Signature



Name : Arun D. Uttarwar  
 Qualification : BE(Civil), M.Tech (Structure) (M. NO. F-125683-8)  
 Chartered engineer, Fellow Member of Institution of Engineers  
 Address :- 35, Deo Nagar Khamla Road, Nagpur-440015  
 Date :-22.12.2023

35, Deo Nagar, Khamla Road, Nagpur-440015  
 Tel.: 0712-2243353/54, +91-9823043162  
 infongp@duson.co.in, arun@duson.co.in

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M/S Solar Industries India LTd  
 At Chakdoh ,Near Bazargaon ,Tah -  
 Katol, Dist Nagpur  
 List of Plant Building/Structures

S. NO.	BUILDING	Marking	SPECIFICATION
1	HMX/HMX Compounded & RDX/RDX Compounded Products manufacturing Building	PP-6	RCC framed structure with RCC roof. PS flooring covered with R/wall earth mound
2	PETN/HMX/RDX/OCTOL/OKPOL /OMA Drying Building	PD-1	RCC framed structure with RCC roof. IPS flooring covered with R/wall earth mound
3	Laboratory for Testing of HMX/RDX	L	RCC framed structure with RCC roof. IPS flooring
4	HMX/RDX Compounded Product Pellet Casting Building	HR-CPCH	RCC framed structure with RCC roof. IPS flooring covered with R/wall earth mound

I have personally gone through the structural drawing & inspected the structures.

It is certified that to the best of my knowledge & experience, the structures are perfectly safe & sound.

Date:- : 22.12.2023  
 Place : Nagpur

  
 Arun D. Uttarwar  
 B.E. (Civil) M.Tech. (Struct.)



ANNEXURE No. 19

(170)

GOVERNMENT OF INDIA  
MINISTRY OF COMMERCE & INDUSTRY  
PETROLEUM AND EXPLOSIVES SAFETY ORGANISATION (PESO)  
(Formerly Department of Explosives)  
5th Floor, A-Block, CGO Complex,  
Seminary Hills, Nagpur 440006  
Tele: 2510248 Fax: 2510577  
Email: explosives@explosives.gov.in

No: E/HQ/MH/20/98(E113453)

Dated : 13/02/2024

To,  
M/s. Solar Industries India Limited,  
Solar House, 14, Kachimet, Amravati Road, Nagpur., Nagpur  
Distt. NAGPUR, State. Maharashtra, Pincode-440023

Subject: Manufacturing of HMX/HMX Compounded Products - Defence, RDX/RDX Compounded Products - Defence situated at Survey No.: 75, 78, 79, 81, 82, 83, 39, 40, 71, 38, 1, 3, 8/1, 8/2, 31, 37, 70, 72, 73/1, 73/2, 74 & 85 of Chakdoh and 29/1, 29/2 of Bazargaon, Village/Town. Chakdoh & Bazargaon, Distt. NAGPUR, State. Maharashtra Licence No. E/HQ/MH/20/98(E113453) granted in Form LE-1 of Explosives Rules, 2008- Revocation of Orders regarding.

Sir,

Reference No E113453 dated 12/02/2024.

The premises was inspected by an officer of NAPES & TS, Nagpur on 08/02/2024 and found premises in order for operation. The inspecting officer recommended revocation of the suspension order. DyCCE, (I/C), NAPES & TS, Nagpur also recommended to CCE, Nagpur to consider the revocation of suspension order. It is also recommended by the officer that the building no CBH-2 may be deleted from the annexure.

In view of above the suspension/cancellation imposed by this office Order no. E/HQ/MH/20/98(E113453) dated 20/12/2023 is hereby revoked. It is advised to submit application for amendment of licence for deletion of building no CBH-2 from the licence.

You may continue the Manufacturing of HMX/HMX Compounded Products - Defence, RDX/RDX Compounded Products - Defence complying the conditions of the licence and provisions of Explosives Act 1884 and Explosives Rules, 2008.

Receipt of this letter may please be acknowledged.

Enclosures :

Yours faithfully,

Dr. S K Dixit  
Deputy Chief Controller of Explosives  
For Chief Controller of Explosives

Copy Forwarded to:

1. District Magistrate, NAGPUR, Maharashtra for further necessary action.
2. Superintendent of Police, NAGPUR, Maharashtra for further necessary action.
3. The Jt. Chief Controller of Explosives, West Circle, Navi Mumbai (M.S.) for information.

4. The Dy. Chief Controller of Explosives, Gondkhairi, Nagpur for information.

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For Chief Controller of Explosives  
[For more information regarding status, fees and other details, please visit our web site <http://peso.gov.in>]

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GOVERNMENT OF INDIA  
 MINISTRY OF COMMERCE & INDUSTRY  
 PETROLEUM AND EXPLOSIVES SAFETY ORGANISATION (PESO)  
 (Formerly Department of Explosives)  
 5th Floor, A-Block, CGO Complex,  
 Seminary Hills, Nagpur 440006  
 Tele: 2510248 Fax: 2510577  
 Email: explosives@explosives.gov.in

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No: E/HQ/MH/20/90(E89848)

Dated : 13/02/2024

To,  
 M/s. Solar Industries India Limited,  
 Solar House, 14, Kachimet, Amravati Road, Nagpur., Nagpur  
 Distt. NAGPUR, State. Maharashtra, Pincode-440023

Subject: **Manufacturing of TNT situated at Survey No.: 75, 78, 79, 81, 82, 83, 39, 40, 71, 38, 1, 3, 8/1, 8/2, 31, 37, 70, 72, 73/1, 73/2, 74 & 85 of Chakdoh and 29/1, 29/2 of Bazargaon, Village/Town. Chakdoh & Bazargaon, Distt. NAGPUR, State. Maharashtra Licence No. E/HQ/MH/20/90(E89848) granted in Form LE-1 of Explosives Rules, 2008- Revocation of Orders regarding.**

Sir,

Reference No CCE/SIIL/135/81 dated 05/02/2024.

The premises was inspected by an officer of NAPES & TS, Nagpur on 07/02/2024 and found premises in order for operation. The inspecting officer recommended revocation of the suspension order. DyCCE, (I/C), NAPES & TS, Nagpur also recommended to CCE, Nagpur to consider the revocation of suspension order.

**In view of above the suspension/cancellation imposed by this office Order no. E/HQ/MH/20/90(E89848) dated 20/12/2023 is hereby revoked.**

You may continue the **Manufacturing of TNT** complying the conditions of the licence and provisions of Explosives Act 1884 and Explosives Rules, 2008.

Receipt of this letter may please be acknowledged.

**Enclosures :**

Yours faithfully,

Dr. S K Dixit  
 Deputy Chief Controller of Explosives  
 For Chief Controller of Explosives

Copy Forwarded to:

1. District Magistrate, NAGPUR, Maharashtra for further necessary action.
2. Superintendent of Police, NAGPUR, Maharashtra for further necessary action.
3. The Jt. Chief Controller of Explosives, West Circle, Navi Mumbai (M.S.) for information.
4. The Dy. Chief Controller of Explosives, Gondkhairi, Nagpur for information.

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For Chief Controller of Explosives

[For more information regarding status, fees and other details, please visit our web site <http://peso.gov.in>]

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# EXTERNAL SAFETY AUDIT REPORT

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**M/s, SOLAR INDUSTRIES INDIA LTD.**

**Village: Chakdoh, Post: Bazargaon,  
Tahsil: Katol, Amravati Road,  
Nagpur - 440023**

**Date: 20.02.2024**



**M. D. SAFETY CONSULTANTS PVT. LTD.**

**PLOT NO. 9/A, VINAYAK NAGAR, NEAR SANT GADGE NAGAR**

**HINGNA ROAD, NAGPUR - 440016**

**MOBILE: 9881724840 PHONE NO.0712-2244948**

**Email: [mdsafetyconsultants@gmail.com](mailto:mdsafetyconsultants@gmail.com); [mdsafety2011@gmail.com](mailto:mdsafety2011@gmail.com);**

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**Acknowledgement**

We give sincere thanks and gratitude to the management of **Solar Industries India Ltd., Village: Chakdoh, Post: Bazargaon, Tahsil: Katol, Amravati Road, Nagpur - 440023** for giving us the opportunity to carry out the safety audit at the plant located at **Bazargaon**. We also pay our special thanks to EHS department for their help and sparing time for the discussion and their deep concern towards the task is highly appreciable. Our sincere thanks to the all department who gives us full co-operation to reach each corner of the plant and provide all relevant information.

We also express our Special thanks to Plant head and employees with whom we interact and with their open and positive attitude we can able to gather objective evidences which are shown to concern Auditee and after their acceptance given in the form of findings in the report.

Thanks to all once again

**For M D Safety Consultants Private Limited**



**Dnyanesh Mase**

**Director**



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**About Team:****Dnyanesh Mase:****Qualification:**

- Mechanical Engineer & Advanced Diploma in Industrial safety from Central Labour Institute, Mumbai, Govt. of India.
- Competent Person under The Maharashtra Factories Rules 1963
- Safety Auditor approved by DISH - (MS/DISH/SA/M-001/2020)
- Chartered Engineer (Mechanical Engineering)
- Safety Auditor trained from National Safety Council, Mumbai
- Lead auditor ISO 14001 and Lead Auditor OHSAS 18001.

**Experience:**

More than 22 Years of working in Construction Industry, Steel Industry, Logistic and Engineering industry.

**Member of:**

- Member of Institute of Engineers (India)
- Life member for Indian Society of Non-Destructive Testing (LM 6225 NP)

**Anil Kamble:****Qualification:**

- B. E. - Electrical (V.R.C.E.)
- L.L.B. Nagpur University
- Advanced Diploma in Industrial safety from M S. B. T. E.
- Competent Person under The Maharashtra Factories Rules 1963
- Safety Auditor approved by DGFASLI, Govt. Of India – (SA/09/10-11)
- Chartered Engineer (Electrical Engineering)

**Experience:** Retired Jt. Director from Directorate of Industrial Safety Health with 35 years' experience for Inspecting various industries in Maharashtra State.

**Member of:**

- Member of Institute of Engineers (India) & Member of institution of Valuers

**Shrikant Deshpande:****Qualification:**

- B E Mechanical B Sc (PCM ) & Advanced Diploma in Industrial safety from Central Labour Institute, Mumbai, Govt. of India.
- Accredited Safety Auditor from DGFASLI, Mumbai Government of India (Regd. No – SA/23/10-11).
- Safety Auditor approved by DISH - (MS/DISH/SA/D-002/2020)
- Auxiliary firefighting course from National Civil Defense College, Nagpur, Ministry of Home Government of India,
- Lead auditor ISO 9001 , 14001 and 45001.

**Experience:**

More than 20 Years of working in Petrochemical plant, Textile plant, Power plant, Rubber plant, Construction Industry , Engineering industry. construction Industry and Engineering industry.

**Member of:**

- Former Secretary of Vidarbha Industrial Safety Committee.

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**About M D Safety Consultants Private Limited:**

It is our immense Pleasure to introduce our company as a, Safety & Risk Management Consultancy Organization. We have mission to safeguard people, processes, and the environment by assisting our clients in maintaining the safety of their operations. Our mission is accomplished through systematic identification of safety-related deficiencies, and the development of risk-minimizing solutions as per statutory & legal requirements and beyond that which are cost-effective and based on sound engineering principles.

We offer following Consulting services for Industries like Refineries, Petrochemicals plants, Oil & Gas, Chemical & Pharmaceutical Plants, Engineering Plants, Cement Plants, Power Plant, Sponge iron plant etc.

**For M. D. Safety Consultants Private Limited.**



**Dnyanesh Mase**

Director



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महाराष्ट्र शासन

## सुरक्षा लेखा परीक्षक मान्यता प्रमाणपत्र

प्रमाणपत्र क्रमांक : औसुवआ/सुलेप/एम-००१/२०२३

उद्योग, ऊर्जा व कामगार विभाग, मंत्रालय, मुंबई यांचे पत्र क्र. एफएसी-२०२३/प्र.क्र.५२/कामगार-४, दिनांक २५/१०/२०२३ अन्वये. श्री. ज्ञानेश दत्तात्रय मसे, फ्लॉट नं.६३, नवीन रामदास पेठ, काचिपुरा, नागपूर-४४० ०१०, यांना महाराष्ट्र कारखाने (सुरक्षा लेखा परीक्षा) नियम, २०१४ चे सुधारीत नियम/अंतिमतः प्रसिध्द होईपर्यंत अथवा १ वर्ष यापैकी जे अगोदर घडेल त्यानुसार अस्तित्वात असलेल्या नियमांतील अटी व शर्तीच्या आधारे सुरक्षा लेखा परीक्षक म्हणून मान्यता देण्यात आली आहे.

त्या अनुषंगाने सुरक्षा लेखा परीक्षण करण्यासाठी दिनांक ३०/१०/२०२३ ते दिनांक २९/१०/२०२४ या कालावधीकरिता हे प्रमाणपत्र आपणास खालील अटी व शर्तीच्या अधीन राहून देण्यात येत आहे:-

१. महाराष्ट्र कारखाने (सुरक्षा लेखा परीक्षा) नियम, २०१४ चे सुधारीत नियम/अंतिमतः प्रसिध्द होईपर्यंत अथवा १ वर्ष यापैकी जे अगोदर घडेल या अटीवर देण्यात येत आहे.
२. सदरहु प्रमाणपत्र महाराष्ट्र कारखाने (सुरक्षा लेखा परीक्षा) नियम, २०१४ मधील तरतुदीं नुसार सुरक्षा लेखा परीक्षण करण्यात यावे.
३. सुरक्षा लेखा परीक्षण हे सुधारीत भारतीय मानक संहितेतील मानक १४४८९:२०१८ नुसार किंवा त्या त्या वेळी अधिभावी असलेल्या कोणत्याही मानकानुसार करण्यात यावे.
४. सुरक्षा लेखा परीक्षण करते वेळी सुरक्षा लेखा परीक्षक किंवा संस्थेने प्राधिकृत केलेल्या व्यक्तीने व्यक्तिशः हजर रहावे व केलेल्या कामाची नोंद नियम ६(२)(ड)(एक) नुसार नोंदवहीमध्ये अद्ययावत ठेवावी.
५. सुरक्षा लेखा परीक्षकाने त्याचा प्रमाणपत्र क्रमांक व कालावधी सुरक्षा लेखा परीक्षण अहवालात नमूद करावा.
६. कोणतेही सुरक्षा लेखा परीक्षण प्राधिकृतीच्या विहित कालावधीनंतर करण्यात येऊ नये.
७. सदर प्रमाणपत्र कोणत्याही वेळी रद्द, निरस्त व सुधारणा करण्याचे अधिकार राज्य शासनाकडे राहतील.
८. सुरक्षा लेखा परीक्षक किंवा संस्थेने प्राधिकृत केलेली व्यक्ती ज्या कारखान्यामध्ये नोकरी करित असेल अथवा त्याच्या कुटुंबातील व्यक्तींच्या, त्यांनी प्रचालन केलेल्या, व्यवस्थापन केलेल्या वा चालविलेल्या कोणत्याही कारखान्याचा भोगवटादार, भागीदार, संचालक किंवा व्यवस्थापक असेल, किंवा ज्या मध्ये लेखा परीक्षकाचा प्रत्यक्ष किंवा अप्रत्यक्ष हितसंबंध असेल. अशा कारखान्यांची सुरक्षा लेखा परीक्षा करणार नाही, ज्या कारखान्याच्या लेखापरीक्षकाने संयंत्र व यंत्र सामुग्री, कच्चा माल, सुरक्षेची साधने किंवा इतर माल, साधने पुरविलेली असेल, अशा कारखान्यांची सुरक्षालेखा परीक्षा करणार नाही.
९. सुरक्षा लेखा परीक्षकाची, संस्थेची किंवा संस्थेने प्राधिकृत केलेल्या व्यक्तीची मान्यता रद्द झाली तरीही, त्याने लेखा परीक्षक म्हणून आपली कर्तव्ये पार पाडण्याच्या ओघात त्याला ज्ञात झालेली कोणतीही उत्पादन विषयक किंवा व्यावसायिक गुपिते किंवा उत्पादन प्रक्रिया किंवा इतर गोपनीय माहिती जाहीर करू नये. यात कसूर झाल्यास, तो त्या वेळी अस्तित्वात असलेल्या कायदानुसार फौजदारी आणि दिवाणी कारवाईस पात्र होईल.
१०. सुरक्षा लेखा परीक्षा प्रमाणपत्राचा नुतनीकरण अर्ज मान्यता कालावधी संपण्याच्या किमान तीन महिने अगोदर या संचालनालयास सादर करावा.

क्र. औसुवआ/अपघात/सुलेप/०९/ ७९२४७,

औद्योगिक सुरक्षा व आरोग्य संचालनालय,  
कामगार भवन, ५ वा मजला, वांद्रे-कुर्ला संकुल,  
वांद्रे (पूर्व), मुंबई-४०० ०५१.

दिनांक : 30 OCT 2023

(दे. भ. गौर)

प्रभारी संचालक,  
औद्योगिक सुरक्षा व आरोग्य,  
महाराष्ट्र राज्य, मुंबई.

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महाराष्ट्र शासन

## सुरक्षा लेखा परीक्षक मान्यता प्रमाणपत्र

प्रमाणपत्र क्रमांक : औसुवआ/सुलेप/डी-००२/२०२३

उद्योग, ऊर्जा व कामगार विभाग, मंत्रालय, मुंबई यांचे पत्र क्र. एफएसी-२०२३/प्र.क्र.५२/कामगार-४, दिनांक २५/१०/२०२३ अन्वये. श्री. श्रीकांत भालचंद्र देशपांडे, ४१, द्रोणाचार्य नगर, त्रिगुर्ती नगरजवळ, नागपूर-४४० ०२२, यांना महाराष्ट्र कारखाने (सुरक्षा लेखा परीक्षा) नियम, २०१४ चे सुधारीत नियम/अंतिमतः प्रसिध्द होईपर्यंत अथवा १ वर्ष यापैकी जे अगोदर घडेल त्यानुसार अस्तित्वात असलेल्या नियमांतील अटी व शर्तीच्या आधारे सुरक्षा लेखा परीक्षक म्हणून मान्यता देण्यात आली आहे.

त्या अनुषंगाने सुरक्षा लेखा परीक्षण करण्यासाठी दिनांक ३०/१०/२०२३ ते दिनांक २९/१०/२०२४ या कालावधीकरीता हे प्रमाणपत्र आपणास खालील अटी व शर्तीच्या अधीन राहून देण्यात येत आहे:-

१. महाराष्ट्र कारखाने (सुरक्षा लेखा परीक्षा) नियम, २०१४ चे सुधारीत नियम/अंतिमतः प्रसिध्द होईपर्यंत अथवा १ वर्ष यापैकी जे अगोदर घडेल या अटीवर देण्यात येत आहे.
२. सदर प्रमाणपत्र महाराष्ट्र कारखाने (सुरक्षा लेखा परीक्षा) नियम, २०१४ मधील तरतुदी नुसार सुरक्षा लेखा परीक्षण करण्यात यावे.
३. सुरक्षा लेखा परीक्षण हे सुधारीत भारतीय मानक संहितेतील मानक १४४८९:२०१८ नुसार किंवा त्या त्या वेळी अधिभावी असलेल्या कोणत्याही मानकानुसार करण्यात यावे.
४. सुरक्षा लेखा परीक्षण करते वेळी सुरक्षा लेखा परीक्षक किंवा संस्थेने प्राधिकृत केलेल्या व्यक्तीने व्यक्तिशः हजर रहावे व केलेल्या कामाची नोंद नियम ६(२)(ड)(एक) नुसार नोंदवहीमध्ये अद्ययावत ठेवावी.
५. सुरक्षा लेखा परीक्षकाने त्याचा प्रमाणपत्र क्रमांक व कालावधी सुरक्षा लेखा परीक्षण अहवालात नमूद करावा.
६. कोणतेही सुरक्षा लेखा परीक्षण प्राधिकृतीच्या विहित कालावधीनंतर करण्यात येऊ नये.
७. सदर प्रमाणपत्र कोणत्याही वेळी रद्द, निरस्त व सुधारणा करण्याचे अधिकार राज्य शासनाकडे राहतील.
८. सुरक्षा लेखा परीक्षक किंवा संस्थेने प्राधिकृत केलेली व्यक्ती ज्या कारखान्यामध्ये नोकरी करित असेल अथवा त्याच्या कुटुंबातील व्यक्तींच्या, त्यांनी प्रचालन केलेल्या, व्यवस्थापन केलेल्या वा चालविलेल्या कोणत्याही कारखान्याचा भोगवटादार, भागीदार, संचालक किंवा व्यवस्थापक असेल, किंवा ज्या मध्ये लेखा परीक्षकाचा प्रत्यक्ष किंवा अप्रत्यक्ष हितसंबंध असेल, अशा कारखान्यांची सुरक्षा लेखा परीक्षा करणार नाही, ज्या कारखान्याच्या लेखापरीक्षकाने संयंत्र व यंत्र सामुग्री, कच्चा माल, सुरक्षेची साधने किंवा इतर माल, साधने पुरविलेली असेल, अशा कारखान्यांची सुरक्षालेखा परीक्षा करणार नाही.
९. सुरक्षा लेखा परीक्षकाची, संस्थेची किंवा संस्थेने प्राधिकृत केलेल्या व्यक्तीची मान्यता रद्द झाली तरीही, त्याने लेखा परीक्षक म्हणून आपली कर्तव्ये पार पाडण्याच्या ओघात त्याला ज्ञात झालेली कोणतीही उत्पादन विषयक किंवा व्यावसायिक गुपिते किंवा उत्पादन प्रक्रिया किंवा इतर गोपनीय माहिती जाहीर करू नये. यात कसूर झाल्यास, तो त्या वेळी अस्तित्वात असलेल्या कायदानुसार फौजदारी आणि दिवाणी कारवाईस पात्र होईल.
१०. सुरक्षा लेखा परीक्षा प्रमाणपत्राचा नुतनीकरण अर्ज मान्यता कालावधी संपण्याच्या किमान तीन महिने अगोदर या संचालनालयास सादर करावा.

क्र. औसुवआ/अपघात/सुलेप/०७/ ७९९२/७,

औद्योगिक सुरक्षा व आरोग्य संचालनालय,  
कामगार भवन, ५ वा मजला, वांद्रे-कुर्ला संकुल,  
वांद्रे (पूर्व), मुंबई-४०० ०५१.

दिनांक : 30 OCT 2023

(दे. भ. गोरे)

प्रभारी संचालक,  
औद्योगिक सुरक्षा व आरोग्य,  
महाराष्ट्र राज्य, मुंबई.

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\*Audit documentary evidences maintained with company.

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**SCHEDULE II**  
(See rule 8 and 9)  
**Proforma for Safety Audit Report**

Sr. No.	Questionnaire	Remark
1	Name and address of the factory	Solar Industries India Ltd., Village: Chakdoh, Post: Bazargaon, Tahsil: Katol, Amravati Road, Nagpur - 440023
2	Name of the occupier	Mr. Milind Deshmukh
3	Date of Audit	20.02.2024
4	List of raw material with maximum storage quantity	Attached
5	List of finished products with maximum storage quantity	Attached
6	Manufacturing process flow chart	Attached
7	P.I. Diagram of all plants (Chemical Factories)	---
8	Name of the Safety Auditor and Certificate No. and name of the person who has carried out safety audit	Dnyanesh Mase : (MS/DISH/SA/M-001/2023) Shrikant Deshpande: (MS/DISH/SA/D-002/2023)
9	Whether enclosed safety audit report as per IS14489 or any such standards prevailing at the relevant time whichever is latest	As per IS: 14489:2018



*[Signature]*  
Signature of Safety Auditor/Person or employee of an  
Institution authorized to carry out safety audit

I (Occupier) undertake to submit the action taken report on recommendations of Safety Audit on or before... 31<sup>st</sup> July, 2024



*[Signature]*  
Signature of the Occupier

## CHAPTER-I

## SECTION 1: EXECUTIVE SUMMARY

## 1.1 THE ASSIGNMENT

## 1.1.1 GROUP / PLANT OVERVIEW

Solar Industries India Ltd., Village: Chakdoh, Post: Bazargaon, Tahsil : Katol, Amravati Road, Nagpur - 440023 an ISO 9001:2015 , ISO 14001:2015 , ISO 45001:2018 certified automated manufacturing plant engaged in manufacturing , the various products in separate process houses i.e. Slurry / Emulsion Explosives, Site Mixed Emulsion Explosives (SME), Electric Detonators, Non electric and electronics detonators, PETN, Detonating Fuse, Cast Booster, Lead Azide and Lead Styphnate manufacturing, Detonator filling-pressing, Multi-layer Shock tube, HMX and HMX compounded products, RDX and RDX compounded products and Trinitrotoluene (TNT).

Solar Key strategy ensuring backward integration of its raw material which are being manufactured viz SMO, PIBSA, Special emulsifier, Calcium nitrate (CN), Sodium nitrate (SN), Zinc nitrate (ZN) and Electronic PCB (Microchip) assembly for electronic detonators.

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### 1.1.2 NEED FOR SAFETY AUDIT

Solar Industries India Limited (SIIL) company is engaged in manufacturing of industrial explosives, Initiating devices and defense products. SIIL is one of the leading manufacturers of explosives in India with employment of more than 2500 employees. Company falls under hazardous manufacturing process (Sec. 2 (b) ) hence as per The Maharashtra Safety Audit Rule 2014, it is legal requirement to conduct External Safety Audit from external agency every 2 years and accordingly Management has decided to conduct the external safety audit this year. In spite of this statutory provision, Management has taken all-due cares regarding safety of the workers at all stages, to propagate the safety culture, to improve the condition at work, to bring safety awareness in the workers, need for safety audit is a must. The external safety audit is conducted as per safety audit rule 2014 by external auditor who is expert in the field of industrial safety.

The company has a clear commitment to meet the highest standards by adopting best possible manufacturing practices without sacrificing safety and environmental regulations. During the course of the assignment, discussions were held with various officials of the company. From these dialogues it was quite evident that apart from the legal obligations the management of **Solar Industries India Ltd.** was really keen for improving the safety culture of the factory. It was, therefore, very prudently thought that if an independent assessment of the status of safety is carried out, it could help the management to identify the areas, and likely hood of any accidents which may take place in the factory. The future safety program could then be designed so as to take corrective actions for "Vulnerable conditions and Actions."

M. D. Safety Consultants Pvt. Ltd., Nagpur is having an accredited safety auditor by state government, competent person under factories act & rules and is a consultant in the field of safety and conducts Safety Audit regularly. Audit team consists of experience experts and certified auditors from DGFASLI. Top management of **Solar Industries India Ltd.** initiated this Safety Audit and engaged auditor for the same. The present Safety Audit is an off – shoot of the above considerations.

### 1.2 OBJECTIVES

This audit is conducted with the objectives to carry out a systematic critical appraisal of all potential hazards involving personnel, plant, services and operations method; and to ensure that Safety systems fully satisfy the legal requirements and those of the company's written safety policies, objectives and progress.

### 1.3 SCOPE

The scope of the audit is restricted to manufacturing facility of **Solar Industries India Ltd.**, Chakdoh. The Safety Audit plan including the scope of the audit and depth of the audit is designed to meet the client's specific safety needs, statutory requirements.

### 1.4 TIME SCHEDULE

The time schedule was finalized in the opening meeting for document verification, plant visits and discussion on the draft and cleared the scope and methodology to be adopted for the audit. Audit was carried out during **20.02.2024**.

### 1.5 AUDIT METHODOLOGY

Audit method and procedure as per Indian Standard 14489: 2018 is used to conduct the audit. The methodology is explained in detail in section Six and the same was explained to the senior management of auditee (SIIL). Evidence is collected through discussion with plant personnel, documents verification and observation of activities and conditions in the areas of concern. Clues suggesting non-conformities are noted if they seem significant, even though not covered by check lists. As the purpose of audit is not to comprehensively check implementation of each safety system element, sample/test check information is collected for the implementation of each element of the safety systems. However, recommendations are not only to correct the observed non-conformity, but the implementation of the element as a whole. The audit was conducted by data collection through questionnaire; document verification and plant visit to observe the operations. The employees were contacted and discussions were held with department heads.

### 1.6 OBSERVATIONS AND COMMENTS

As the purpose of audit is not to comprehensively check, implementation of each safety system element, sample/test check information is collected for the implementation of each element of the SAFETY system. During plant visit observations for unsafe conditions/unsafe acts were carried out. Status of the following safety aspects noted and discussed with the concerned persons and comments recorded in the text of this with suggestions wherever appropriate.

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- Health and safety policy.
- Safety and Health organization.
  - Safety department functions
  - Safety committee (s)
- Accident reporting, accident investigation and analysis
- Safety inspections
- Safety, education and awareness
  - Training / Periodic training/retraining
  - Safety communication/motivation promotion
- First aid / Occupational health center
- General working conditions
  - House keeping
  - Noise
  - Ventilation
  - Illumination
- Hazard identification control
- Safe operating procedures (SOPs)
- Work permit system
- Waste disposal system
- Personal protective equipment's (PPE)
- Fire protection
- Emergency preparedness
- Plant layout and area classification
- Static electricity
- Pressure vessels (fired and unfired)
- New equipment reviews
- Lifting machines and tackle
- Mobile equipment and vehicular traffic
- Access
- Material handling

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- Tank storage vessel area
- On – site gas cylinders storage area
- Communication system adopted in plant
- Statutory approvals

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## SECTION 2: INTRODUCTION

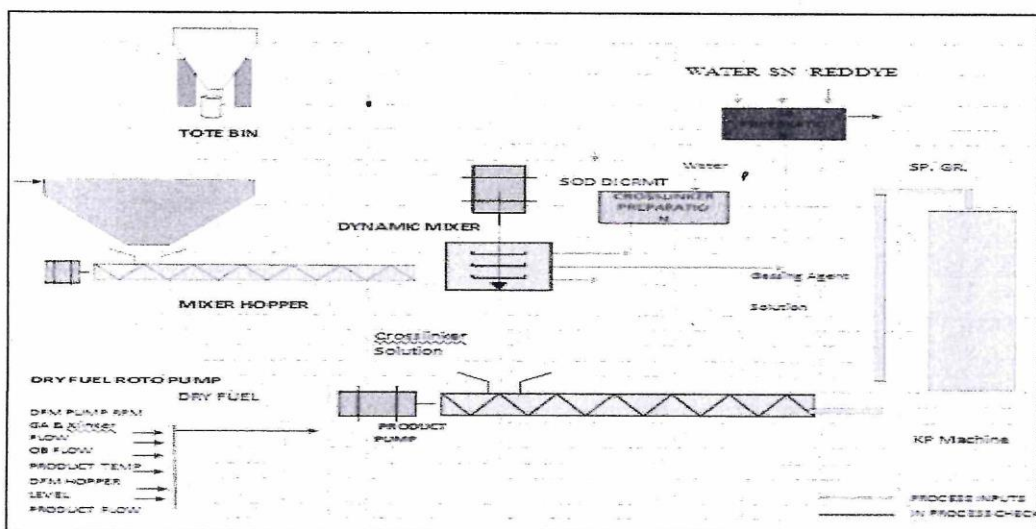
M/s. Solar Industries India Limited located at Village: Chakdoh, (Near Bazargaon) Amravati Road, Nagpur (Maharashtra) is manufacturing industrial explosives, initiating devices and defense products in separate process houses i.e. Slurry / Emulsion Explosives, Site mixed emulsion explosives (SME), Electric Detonators, Non electric detonators and electronics detonators, PETN, Cast Booster, Detonating Fuse, Lead Azide and Lead Styphnate manufacturing for captive uses, Detonator filling-pressing, Multi-layer Shock tube, HMX and HMX compounded products, RDX and RDX compounded products and Trinitrotoluene(TNT). The process is suitably considered for hazards and risk of fire and environmental components.

**Manufacturing processes of various products are described as follows:**

### 1. Slurry Explosives: (PP-1, PP-2, PP-3, PP-11)

In the manufacturing of continuous Slurry Explosives following process steps are involved:

- For preparing dry fuel a specified quantity of Starch powder, Sulphur powder and aluminum flakes are mixed in dry condition with Nitrogen purging in the Dry Fuel Mixing (DFM) Area. Dry fuel is loaded in tote bins and transported to the process buildings.
- For preparing the Oxidizer blend (OB) AN melt, CN, Thiourea etc. are mixed in the reactor. For Gum preparation MEG and Guar gum are mixed in a separate reactor. This guar gum is then added to the OB.
- Dry Fuel, OB, Cross linker, and Gassing agent (GA) are mixed in the dynamic mixer; prepared explosive matrix is then pumped through roto pump towards KP machine for artridging.
- The explosives cartridges are packed in corrugated boxes each weighing 25 kg net weight. The finally packed material boxes then transferred to storage magazine for storage and onward dispatches. Process flow of slurry manufacturing depicted below:

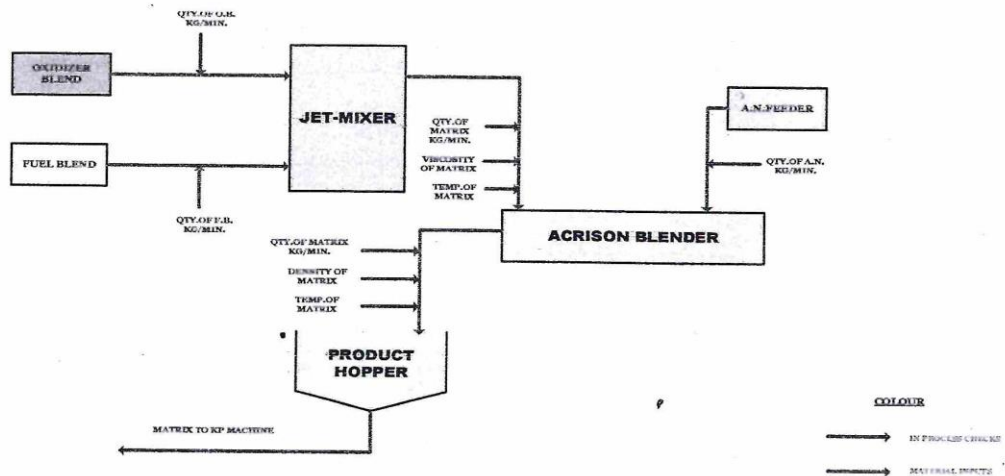


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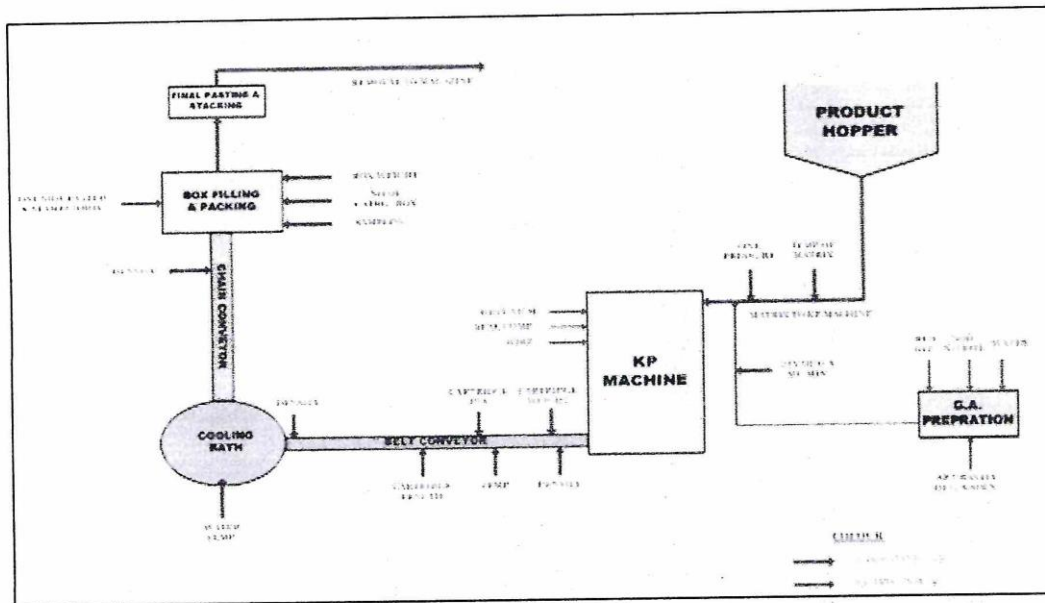
## 2. Emulsion Explosives: (PP-4, PP-5, PP-7, PP-9, PP-12, PP-16 and PP-21)

In the manufacture of Emulsion Explosives, the following process steps are involved: -

1. Preparation of Raw Material
  2. Preparation of Oxidizer Blend Solution (OB).
  3. Preparation of Fuel Blend (FB).
  4. Preparation of Emulsion Matrix by mixing Oxidizer solution (OB) and fuel blend (FB).
  5. Addition of do-pants, if necessary.
  6. Cartridging is various diameters.
  7. Packing.
- a. Various raw materials like A. N. Melt, Sodium Nitrate, SMO, Waxes, emulsifier etc. are sent to the process plants.
  - b. Pre-weighed quantities AN, SN etc. are charged into a reactor to prepare oxidizer solution.
  - c. Pre-weighed quantities of emulsifiers, oils and waxes are taken into another reactor where a fuel blend is prepared.
  - d. Desired quantities of oxidizer solution and fuel blend are pumped into a mixer where emulsification and do-pants addition are carried out.
  - e. The emulsion is then pumped into a Cartridging packing machine (KP), and the cartridges sent for packing.
  - f. Process flow of Emulsion explosives manufacturing includes mixing, cartridging and packing are shown below:



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### 3. Pentaerythritol tetra nitrate (PETN): (Batch Process PP-8 & PP-10) and Continuous Process PP-14)

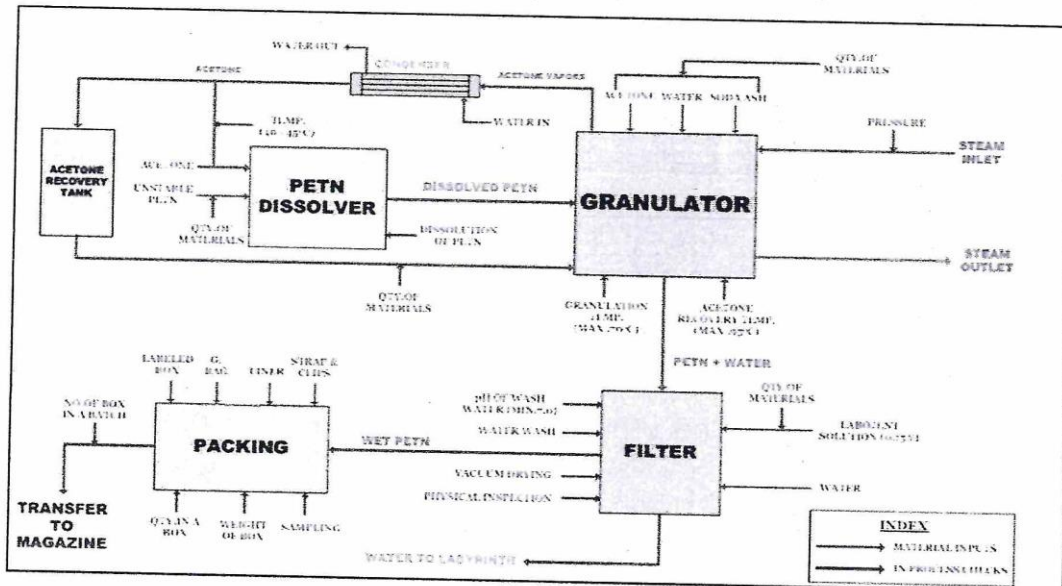
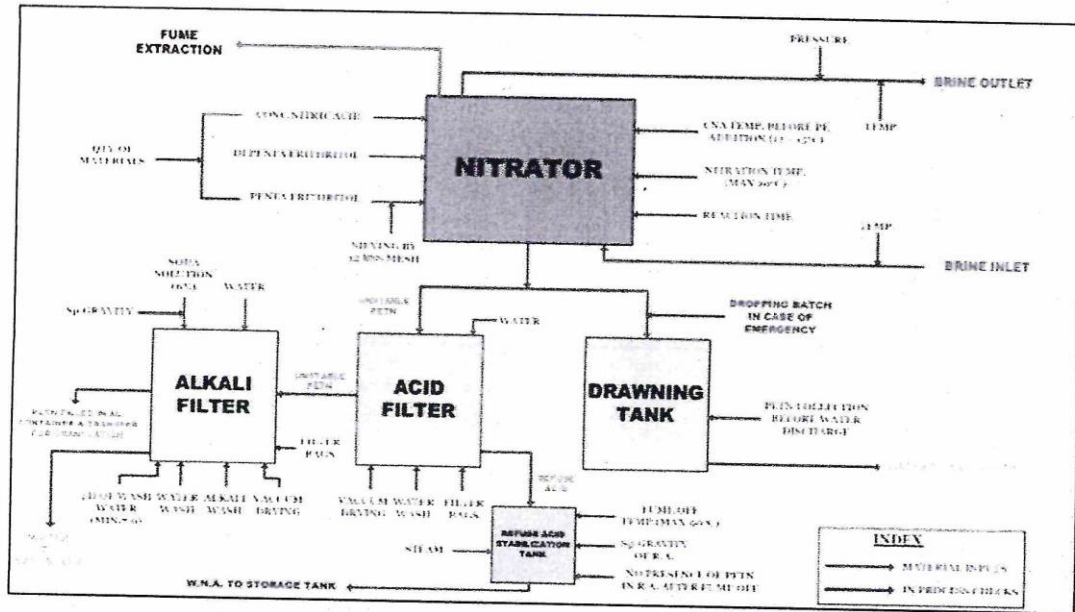
#### 3.1 PETN is manufactured by the nitration of PE (Pentaerythritol) with Conc. Nitric Acid

- Raw materials like PE, Acetone etc. are transferred to PP8, PP-10 and PP 14.
- Required quantity of Conc. Nitric Acid is pumped from storage tanks to nitrator, via a measuring vessel, where the temperature of acid is brought down in the desired process limits by circulating chilled brine solution in the jacket of the nitrator.
- PE is gradually added to the acid in the nitrator maintaining the desired temperature with continuous stirring.
- After all PE is added and nitration is completed, the unstabilized PETN is dropped into the acid filter, where the acid is removed by washing with water and subsequently by alkali solution. This PETN is then re granulated with acetone water before final washing.
- In PP 14, the continuous process for manufacture of PETN is used while in PP 8 & PP 10, batch process manufacturing is used.

#### 3.2 PETN Drying: (PD-2, PD-3, PD-4, PD-5, PD-6, PD-7, PD-8, PD-10)

PETN is dried in the drying vessels with the help of hot air circulation.

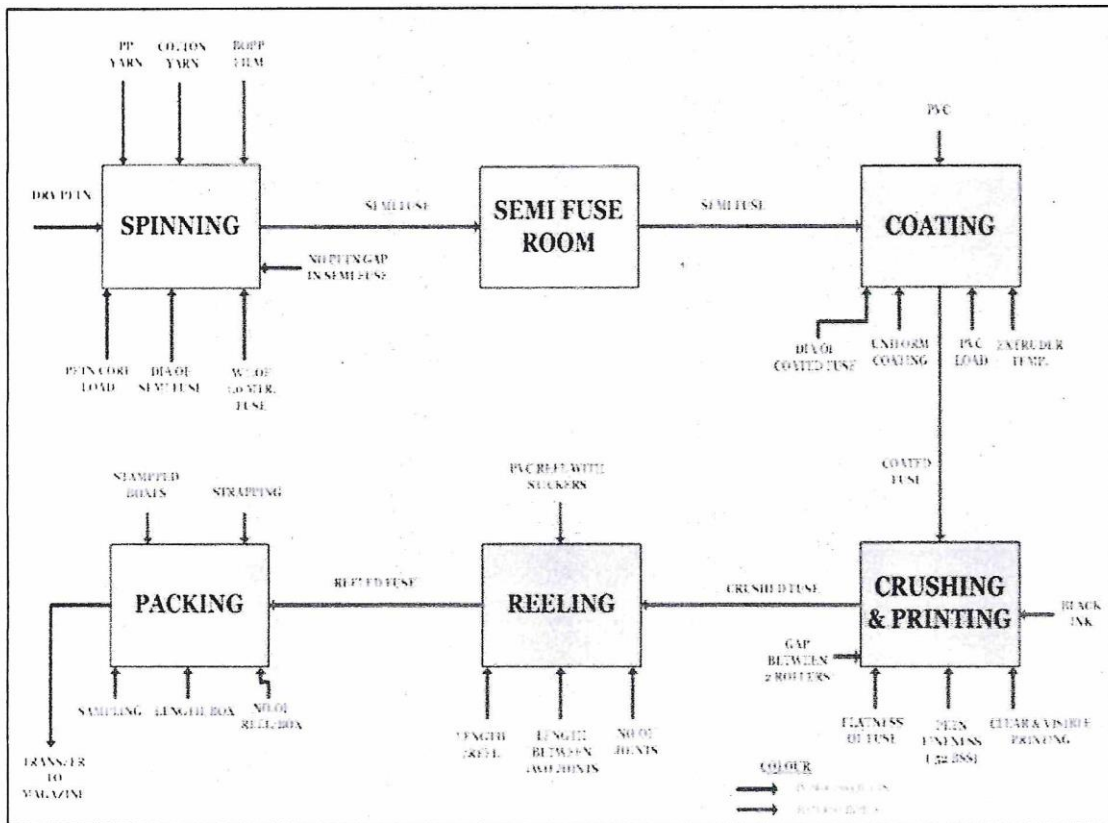
Weighed quantity of wet PETN is placed in cotton bags and hot air flows into drying vessels till inlet and outlet temperature equalized. Dried PETN bags are cooled to room temperature and sieved through 18 BSS and packed in aluminum container and further sent to process .



#### 4. Detonating Fuse: (DF-1, DF-2, DF-3)

- The detonating fuse (Detonating cord) is manufactured by encapsulating core of PETN in BOPP tape and covering this with number of strands of polypropylene yarn & by providing a coating of PVC.
- Raw materials like dry PETN, Polypropylene Yarn, Cotton yarn and PVC Granules etc. are transferred to plants.
- Semi-Fuse is first prepared in a spinning machine by encapsulating a core of PETN in BOPP tape which in turn has yarns of cotton and Polypropylene covering it.
- Semi-Fuse is then coated with PVC and subsequently passed through crushing rollers.
- This crushed coated fuse is then wound on reels to the desired length, packed in boxes & sent to magazine.

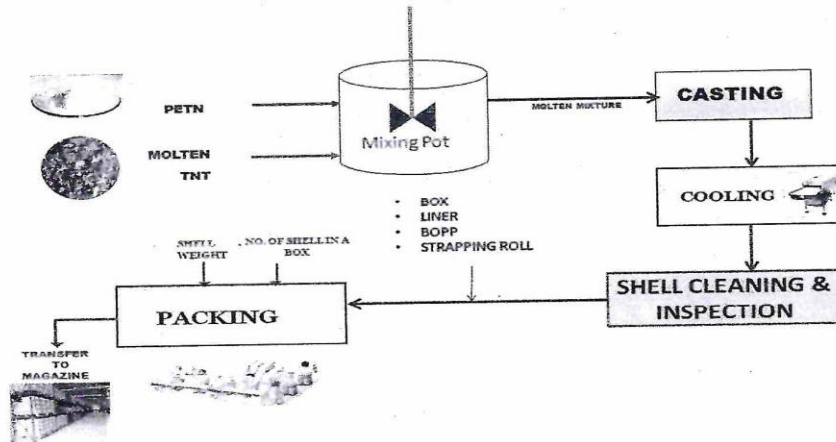
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##### 5. Cast Booster Manufacturing: (CBH-3, CBH-4, CBH-5, CBH-6, CBH-7, CBH-10)

- Cast Boosters are made by first melting TNT in a melting pot and then dispersing PETN in the molten TNT.
- This molten TNT / PETN mixture is cast into plastic shells and paper shells, cooled in the cooling chambers.
- The cooled shells are inspected and packed in corrugated fiberboard case and sent to magazine.

Process flow sheet of cast booster is as follows:



## 6. Detonators Manufacturing:

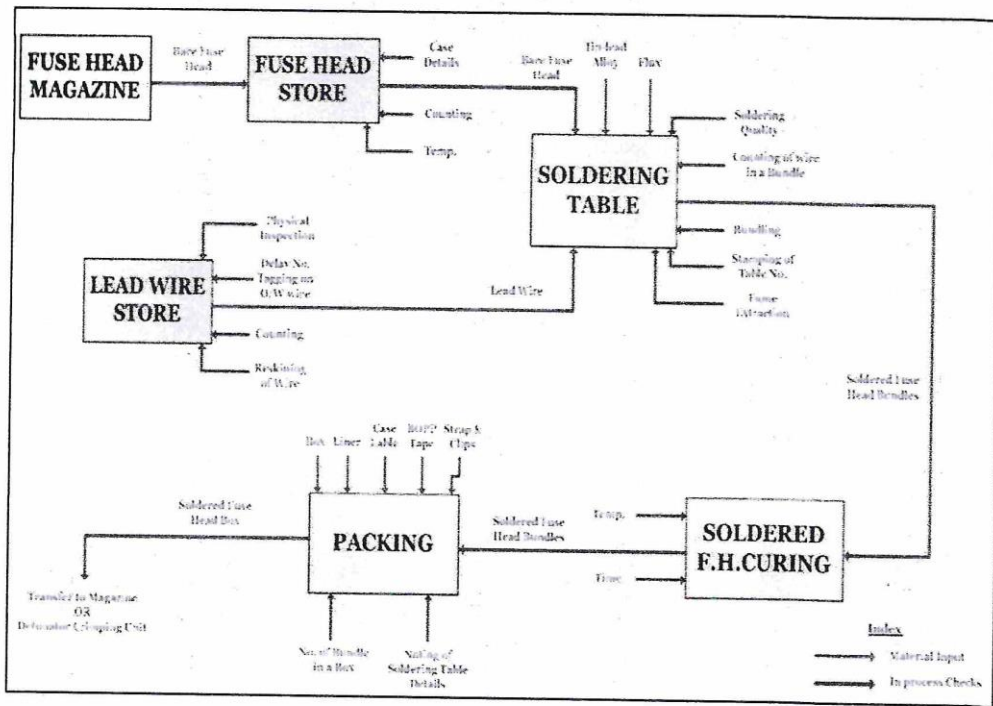
Detonators comprising of Electric detonators, non-electric detonators, and electronic detonators. Fuse head manufacturing, lead azide and lead styphnate (LA/LS) manufacturing, drying of LA/LS with Aluminum powder (ASA), Filling & Pressing of filled shells, activity involved in the manufacturing electric detonator and non-electric detonators. Shock tube is manufactured which is used in non-electric detonators and electronic chip for electronic detonators.

### 6.1 Assembly of Electric detonators: (Crimping & Packing House CPH-1, CPH-2, CPH-3, CPH-4)

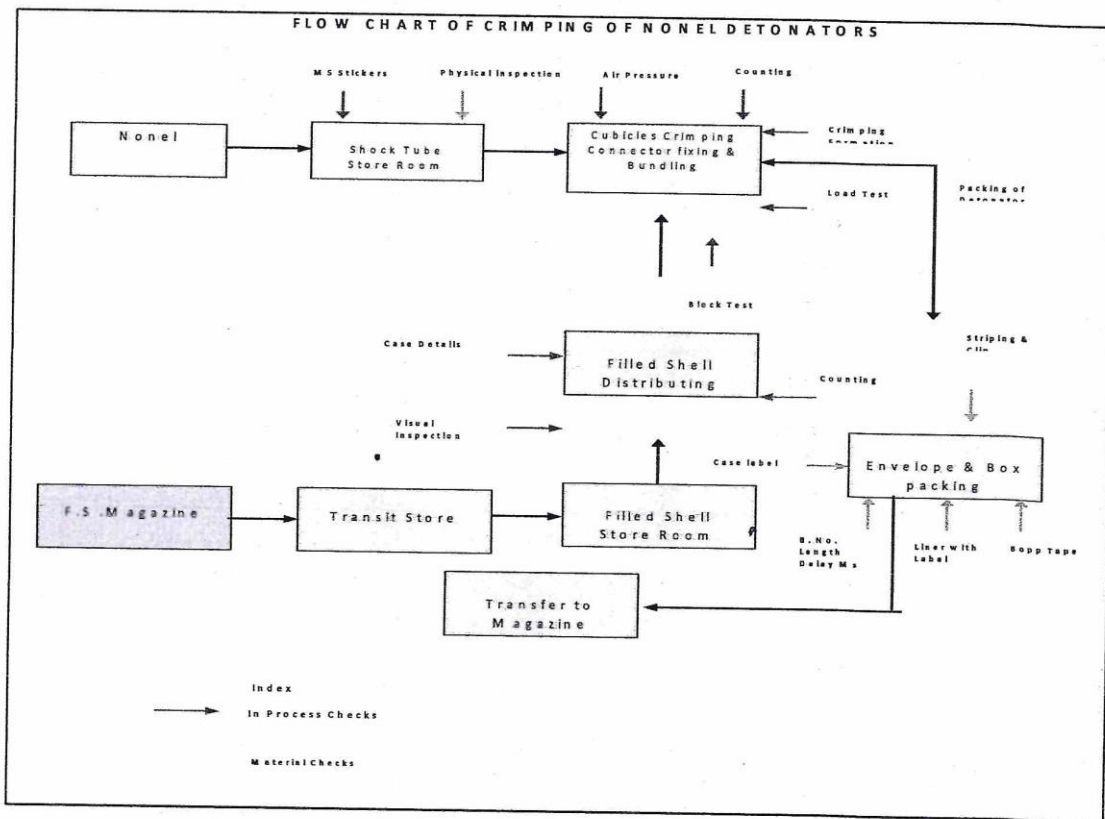
- In soldered Fuse Heads and filled shells store, material is unpacked and visually inspected for any defects such as rusting, moisture, improper filling of shells etc. and sent to the Crimping & Packing House shop floor.
- On the shop floor, soldered Fuse Heads are crimped with filled Shells by pneumatic operated collets at high pressure. After crimping, resistance of the lead wire is measured, and 25 Nos. crimped Detonators are bundled and sent for packing.
- Two bundles of 25 each are wrapped in wrapping paper. These 50 wrapped bundles are packed in fiberboard case. Finally, the packed fiberboard case is sent to storage magazine for storing & dispatch.

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Process flow diagram of Electric detonators is as follows:



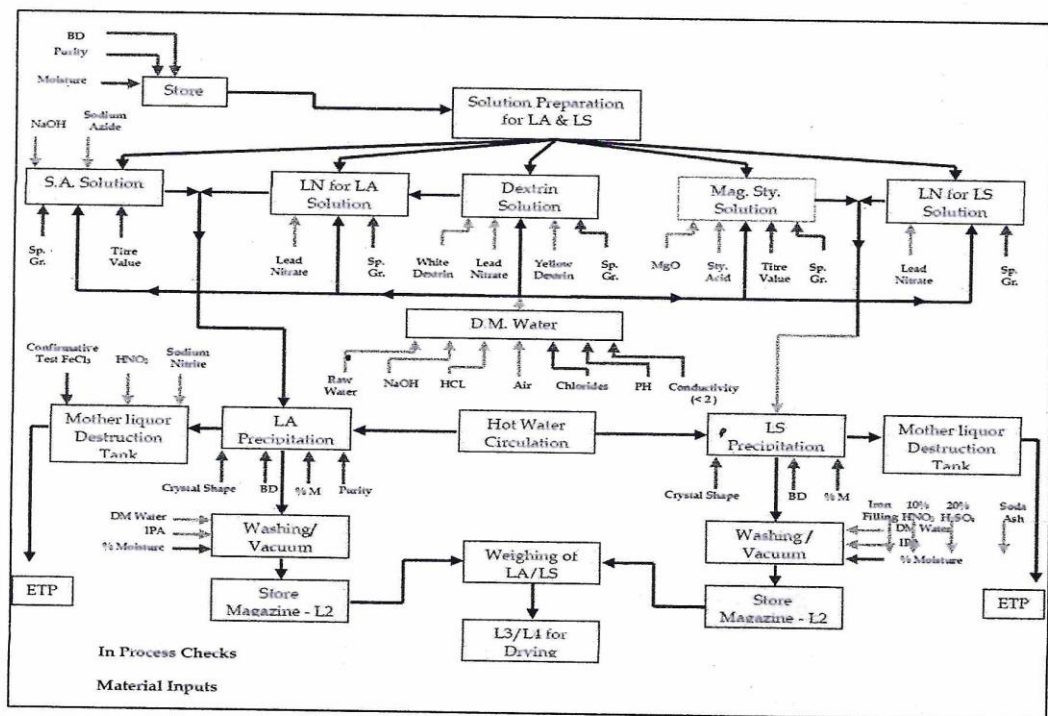
Process flow diagram of non-electric detonators is as follows:



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## 6.2 Lead Azide (LA), LS manufacturing, & ASA Drying: (SL-1, SL-2, SL-3, SL-4, SL-5)

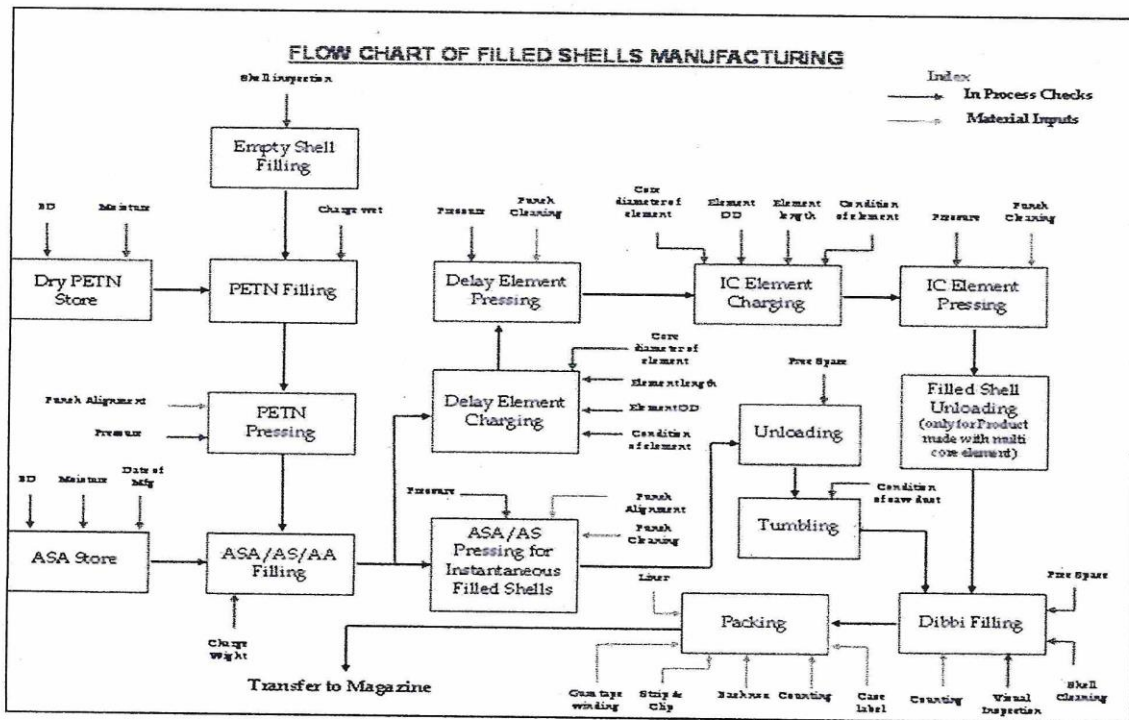
- LA manufacturing measured quantity of lead nitrate solution is taken into the autoclave vessel (vessel temperature 35- 38°C). The agitator of the autoclave is started with dozing of earlier prepared Sodium Azide solution. The resultant will be Lead Azide which is washed with DM water for minimum 4 times and then the crystal sized are checked before storing. Lead Azide is manufactured at SL-1 building.
- LS manufacturing Measured quantity of Magnesium Styphnate solution is taken into the autoclave vessel (vessel temperature 60 - 65° C). The agitator of the autoclave started with dozing of earlier prepared Lead Nitrate solution. The resultant will be Lead Styphnate which is washed with DM water for Minimum 4 time and then the crystal sized are checked before storing. Lead Styphnate is manufactured at SL-1 building. SL-2 building is used as store for wet LA/LS and Dry ASA.
- ASA drying measured quantity of Lead Azide, Lead Styphnate, Lead Stearate and Aluminum is first manually mixed with the help of Aluminum comb, the mixer is termed as ASA and then allowed to get dry in close vicinity with the help coil heater for 1 hour & 30 minutes. The mixer is allowed to cool and collected in conductive bottles (each bottle capacity is approximately 1 Kg). ASA drying buildings are SL-3, SL-4 and SL-5).
- Manufacturing flow sheet of LA & LS is as following:



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6.3 Detonator filling and Pressing: (SD-1, SD-2 & SD-3)

- a. 136 numbers of empty detonators are kept in a ladle made of Hylum material. This ladle is then allowed to go through a series of operations in closed vicinity and maintaining the humidity level.
- b. In the first cubicle a measured quantity of PETN is filled in all the shells and ladle is passed to second cubicle. In second cubicle the filled PETN is pressed by applying pneumatic pressure with the help of SS punches for its proper settling. In the third and fourth cubicle ASA filling and pressing is done respectively.
- c. After filling & pressing operation unloading operation is performed to check any loose material and then the filled shells are allowed to rotate in tumbling barrels with saw dust.
- d. These filled shells after tumbling are collected and arranged in small cartons in 100 numbers in each carton. 40 numbers of such small cartons with filled shells are then packed in a wooden case.



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## 7.0 MANUFACTURING OF MULTILAYER SHOCK TUBES, COILING & CUTTING

In SN-1 plant multilayer shock tubes are manufactured for that HMX and aluminum powder is mixed, and this composition is used during manufacturing of multilayer shock tubes. Manufactured multilayer shock tubes are coiled on 3000-meter spool.

### A. Composition Preparation: -

- a. Weigh 900-gram HMX & 100-gram Al. Powder for one batch.
- b. Put the weighed material in mixing vessel and add rubber balls of 20-, 25- & 30-mm diameter 4 numbers each. Allow mixing for two hours.
- c. Place the composition in the rack for 24 hours of curing.

### B. Composition charging: -

- i. Carry the antistatic cup filled with composition and place it in the window at the market place.
- ii. Take the antistatic cup & place it into the horizontal elevator & close elevator door with outer safety door. Cup will automatically lift up & carry up to hopper & empty cup came down by elevator after unloading.

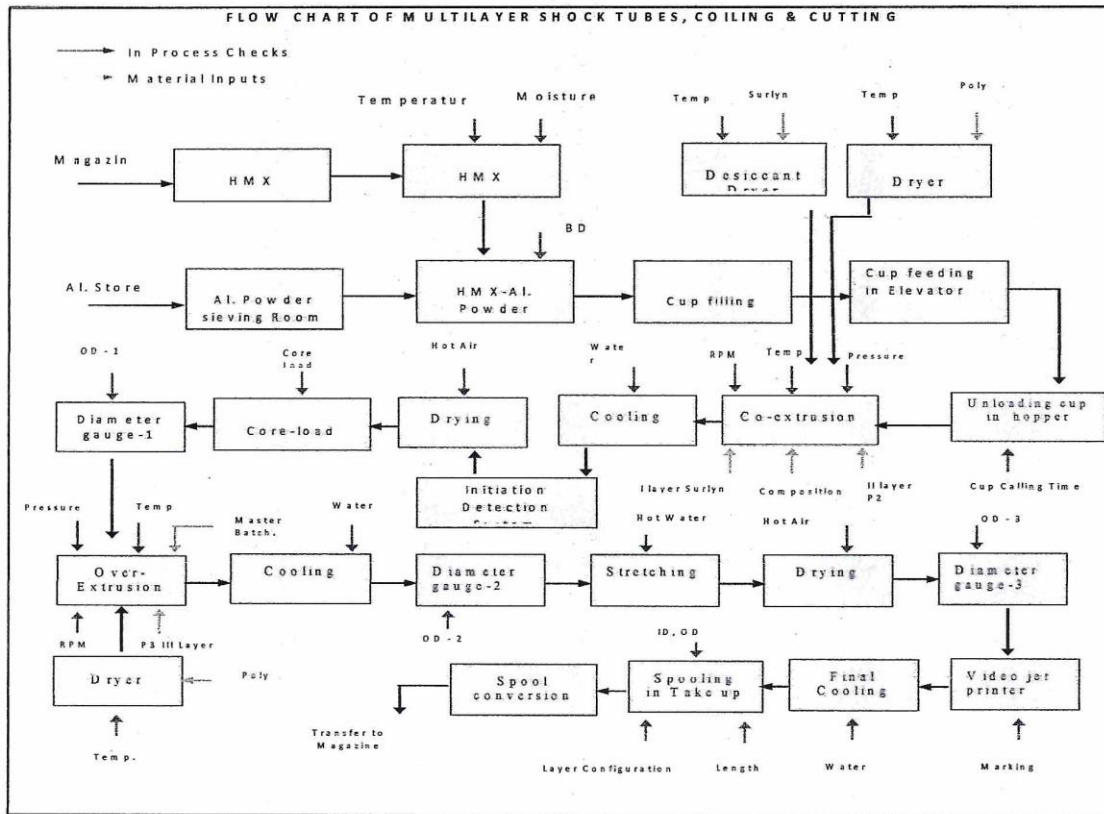
### C. Co- EXTRUSION PROCESS

- a. Start Descent Dryer.
- b. Start all the Labtech Material handling blower for transfer raw material to respective
- c. hopper.
- d. Check the interlock for heating operation & start heating of Ext-1, 2,3.
- e. Thread up the Primary Line in proper way & take pulley of vertical cooling at start- up
- f. position.
- g. Check the heating operation on HMI screen, if ok then start the Ext-1, 2, 3.
- h. Purge some plastic material with increasing RPM of Ext. Until clean plastic Observed,
- i. then stop Ext-2 first then Ext-1.
- j. Clean the Die-head of Ext-1 & 2 with the help of drill bit & brass knife.
- k. Clean the Die-head of Ext-1 & 2 by purging air.
- l. Insert Start-up cannula in Die-head of Ext-1 & 2
- m. Take wire cutter to proper position & insert lead wire throughout cutter, die head of
- n. Ext-1 & Up to joint position.
- o. After joint press Prim. Enable then Prim. Start push button.
- p. Check the flow of material & close the cooling pot.
- q. Check the quality of tube for next operation & close the Horizontal dryer lid.

Cutting, coiling and end sealing of shock tube in the required length are carried out in SN-3 building.

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Flow sheet of shock tube manufacturing is as follows:



### 8.0 Bulk Emulsion Manufacturing: Bulk emulsion is called as Site Mixed Explosive (SME)

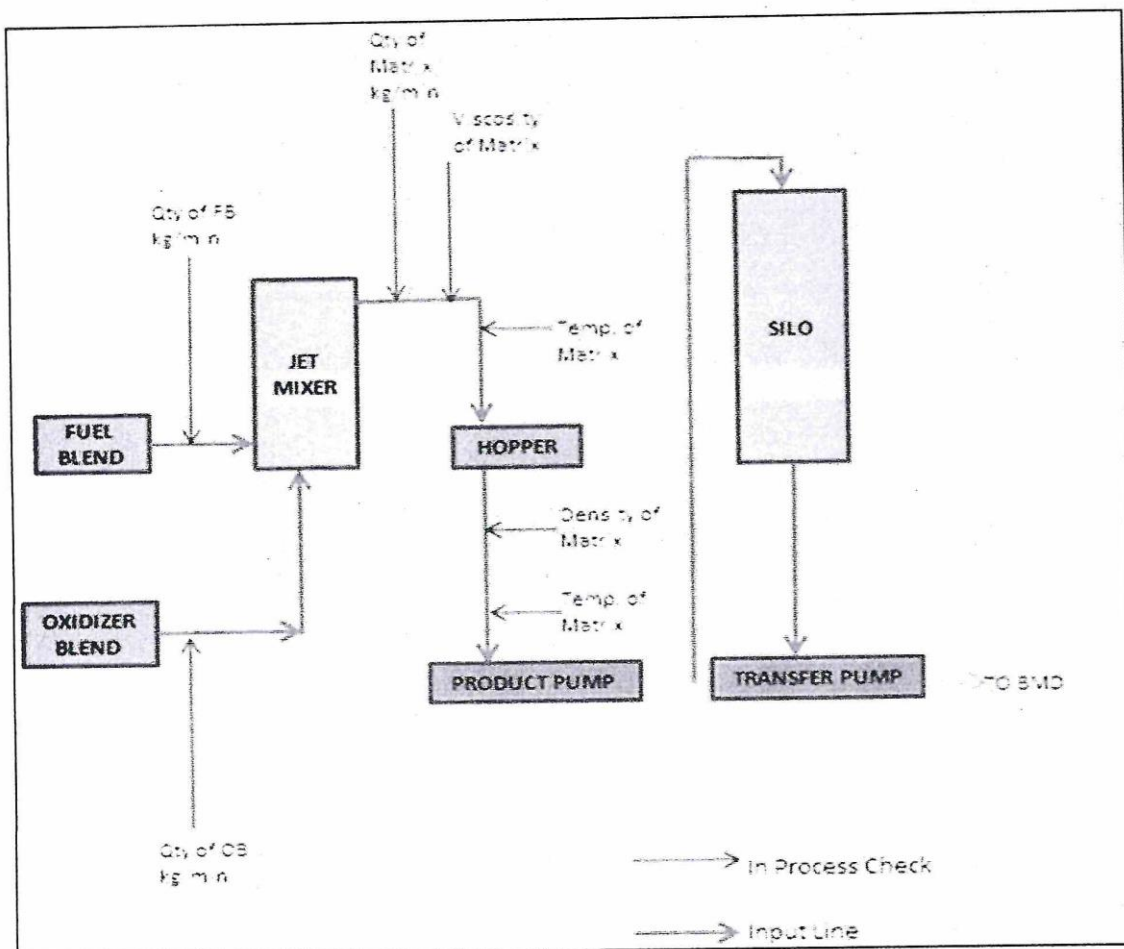
- a. In the manufacture of Bulk Emulsion Explosives, the following process steps are involved.
- b. Preparation of Raw Material
- c. Preparation of Oxidizer Solution.
- d. Preparation of Fuel Blend.
- e. Preparation of Bulk Matrix by mixing Oxidizer solution and fuel blend.

#### Detailed manufacturing process steps are as following:

- f. Various raw materials like A. N. Melt, Furnace oil, SMO, Zinc nitrate etc. are used
- g. pre-weighed quantities AN, ZN etc. are charged into a reactor to prepare oxidizer solution.
- h. Pre weighed quantities of Furnace oils and SMO are taken into another reactor where a fuel blend is prepared.
- i. Desired quantities of oxidizer solution and fuel blend are pumped into a Jet mixer where emulsification is carried out.
- j. The Bulk emulsion is then pumped into a hopper and then hopper to silo.
- k. Finally the bulk emulsion is transferred into BMD vehicle.

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Process flow diagram is as follows:

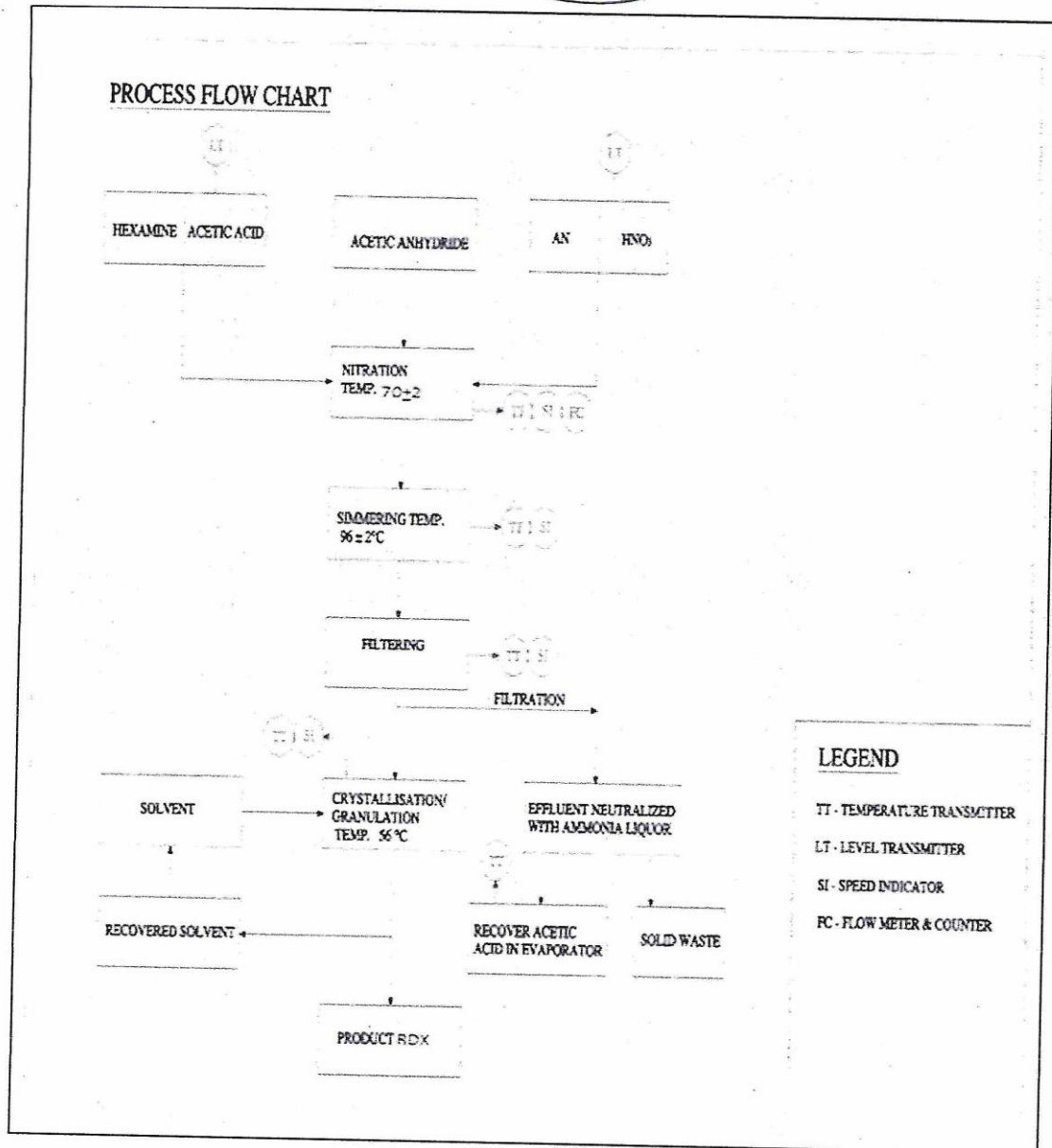


### 9. HMX & HMX Compounded products: (PP-6 & PP-15)

HMX is produced by the nitration of Hexamine in Acetic Acid medium by two step Nitration process using a nitrating medium of 85% solution of Ammonium Nitrate in 98% Nitric Acid. The product thus obtained is HMX (diluted with water and simmered at 100 deg. C for one hour for removing impurities. The pure grade HMX is  $\beta$  grade. This crude HMX is filtered in a vacuum filter. It is then crystallized in a medium of solvent and then separated by filtration/Decantation. The HMX is sieved using wet sieving and packed and stored.

HMX compounded products such as OCTOL, OKFOL, OMA are manufactured by adding the different additives at the crystallization stage.

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### 10. Process Description for RDX Crystallization and Granulation

**a. RDX Crystallization Process:** Crystallization requires of various class of RDX product. Crystallization process is basically a finish product of RDX. Its specially perform to give shape and size to the crystals manufactured from RDX. It is based on the limited solubility of a material in a solvent (BLO) at the specified temperature range.

### b. Crystallization of Crude RDX/RDX

BLO is taken from BLO holdup tank to Crystallizer by applying vacuum. Solvent level should be 45% in the crystallizer. Shut down vacuum Pump.

Crude RDX/RDX product is added manually through the Charging hole of the crystallizer. Charging material capacity is 625 Kg per batch with minimum agitation at 40%.

Start heating cycle to 50-55°C, without vacuum. After achieving temperature apply vacuum through the distillation column and heat up to 72-75 °C. Distillation column is used to prevent the loss of BLO.

After achieving desired temperature open reflux valve of distillation manually. Regularly check the flow of reflex in the view glass below condenser.

BLO is collected at the bottom of Distillation column & pumped through AODD pump to Crystallizer; Water is collected at the top pot through condenser after cooling the vapors.

This water is going ETP via Labyrinths as traces of Acetic Acid are also present in water.

The water stripping process is completed at 92-96 °C of reactor temperature. & shut down vacuum pump. Continue the heating cycle up to 112-118 °C. In this process the solution becomes clear indicating complete dissolution of material in BLO.

Temperature is noted at which solution becomes clear, then start cooling maintaining the temperature difference.

Cooling Cycles are decided according to product specification. While dropping batch to Nutsch filter agitation is kept at 40-70% and temperature 15-30 °C.

#### **C. Product Filtration at Nutsch**

While dropping material to Nutsch filter BLO suck back is continued to BLO holdup tank through vacuum.

1st water wash is done, as this wash contains more BLO, the liquid is sucked back to Crystallizer.

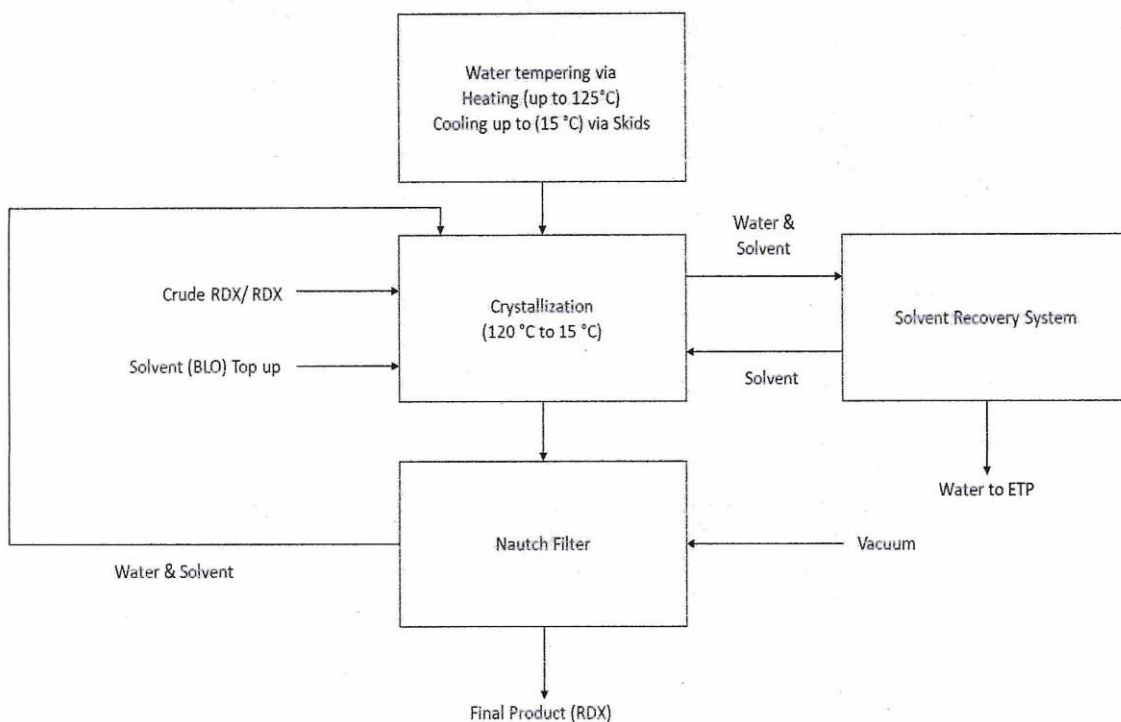
Water from the 2nd & 3rd water wash recollected at vacuum trap goes to ETP.

Material in Nutsch Filter is vacuum dried for 2-3 hours.

Material with required moisture percentage is collected and weight in containers or boxes.

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### Process Flowchart – RDX Crystallization



#### C. Granulation of RDX compounded product:

The granulation process combines one or more particles and forms a granule. It is the process of collecting particles together by creating bonds between them. Bonds are formed by using a binding agent.

Take DM water in reactor up to 60 - 65% level of reactor. Agitate with 30%.

Start Heating the reactor up to 35°C & add RDX as per batch size (maximum 625 kg) through man manhole.

Level in reactor reaches above 75%, Agitate material with 60% agitation.

Heat to 70 °C with 80% agitation & then add Wax / TNT/ Solution of polymer in MEK.

Agitation is increased to 100% just completion before addition, reactor is heated up to 98°C, Maintain reactor at 98°C for 30 to 45 Minutes.

Stop Heating & add Graphite if required, keeping agitation at 100%. After graphite addition Cool reactor by quenching with chilled DM water till 72°C.

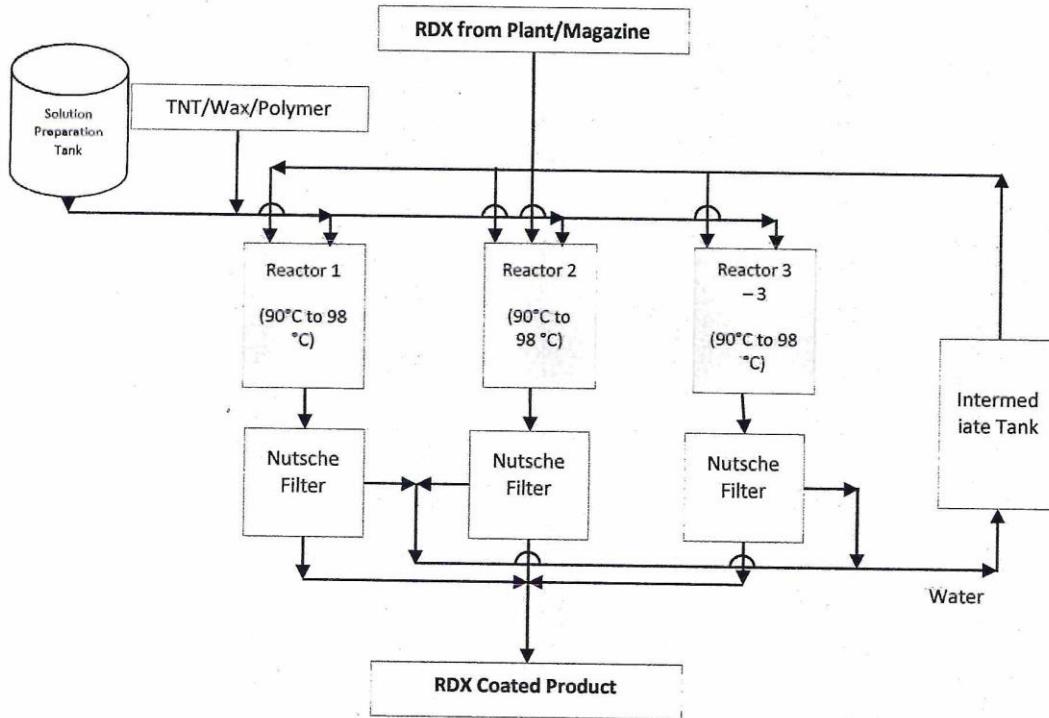
The level of reactor reached 90% by the time all the process finished.

Start cooling and drop the product as per the required temp.to Nutsch with 50-70% agitation.

Suck water to intermediate tank, vacuum dry the product and send to drying Building.

**HMX/RDX Drying Buildings:**

HMX/RDX drying required to manufacture HMX/RDX compounded products. Drying of wet HMX and RDX is carried out in PD-1, and HD-5 buildings.

**Process Flow Chart – RDX Granulation****11.0 Manufacture of Tri Nitro Toluene (TNT):**

(i) TNT manufacturing is a four-step process:

- a) Nitration
- b) Washing
- c) Drying
- d) Flaking.

**(i). Nitration:** Nitration TNT reacts with WNA to form DNT, further this DNT reacts with CNA to form TNT. The water generated during the reaction is removed with the help of Oleum. Spent acid generated in the nitration reaction is then sent for de-nitration where it is braked into Weak Nitric acid (WNA) and Weak Sulphuric acid (WSA).

**(ii) Washing:** Impurities in the crude TNT is mainly due to DNT and unsymmetrical TNT cause a depression of the solidification points from 80.2°C for pure TNT to 80.2 – 80.6°C. For this reason

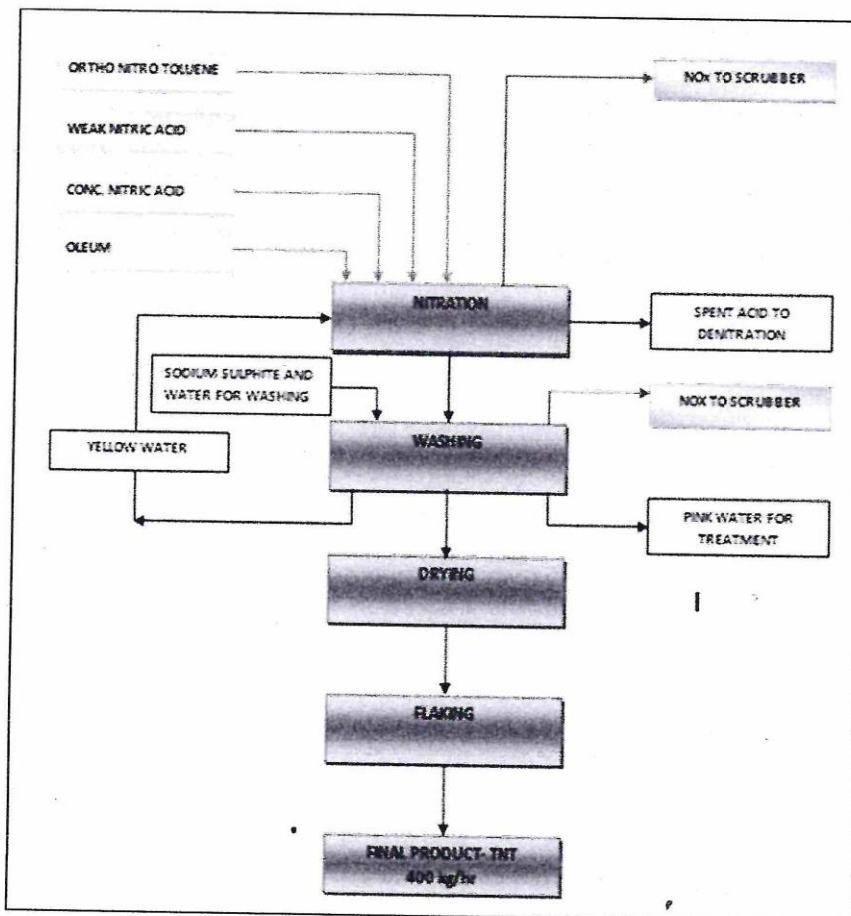
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washing of crude TNT is done with help of sodium sulphite. Pink water generated is further sent for treatment.

(III) **Drying:** The purified TNT contains approximately 0.7% dissolved water which must be removed before entering the flaking unit so that the final product will get a high setting point.

(IV) **Flaking:** The molten TNT is picked up on a water-cooled rotating drum solidified and scraped off with a doctor blade (material in brass) which shatters it into small irregular pieces. The flakes are collected in a hopper and from there is packed in boxes.

Process flow sheet of TNT manufacture is shown below:



**SECTION 3: AUDIT CONCEPT**

- 3.0 Safety Audit** is an important tool for identifying falling standards, areas of risks or vulnerability hazards and potential accidents in proposed and existing plants and processes for determining the action necessary to remove hazards before personal injuries or damage occur. The loss potential in the factory in particular is high and not restricted to large – scale incidents to accidents, fires, spillage of hazardous chemical explosions, toxic gas release and similar incidents.
- 3.1 Safety Audit and inspections** are necessary for all industrial activity. The Health and Safety performance of the Organization depends on Management control. Health and Safety must therefore be efficiently managed, if performance is to be effective. Improvement to Health and Safety performance can be stimulated by various means by including the following.
- 3.2** Moving from a reactive to a protective approach to Health and Safety issues i.e. not waiting for an accident, injury or loss to occur before acting. Identifying what exactly needs to be controlled and setting standards and performance measurements criteria.
- 3.3** Adopting the same disciplines to Management Control and Responsibility as are applied to financial or production management.
- 3.4** In short, successful Health and Safety Management requires commitment to a policy and program of continuous improvement by those in charge, together with a regular audit of that program, as an ongoing process.
- 3.5** Updating is the means by which information can be gathered in order to fulfill the requirement for review stipulated in the statute. It is the culmination of a series of activities, which make up and organizations Health and Safety program beginning with the policy statement from the Occupier, which is developed into systems and procedures by middle management for implementation by those carrying out the work of the organization.
- 3.6** Auditing examines each stage in the Health and Safety Management system by measuring compliance, with the controls the organization has developed with the ultimate aim of assessing their effectiveness and their validity for the future.
- 3.7** The Audit system is based on the code of practices on Occupational Health and Safety Audit; framed by the Bureau of Indian Standards (IS 14489: 2018)

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**SECTION 4: AUDIT OBJECTIVES**

This Safety audit is conducted with the following objectives:

- 4.1 To carry out a systematic critical appraisal of all potential hazards involving personnel, plant, services and operation method.
- 4.2 To ensure that SAFETY system fully satisfies the legal requirements and those of the company's written safety policies, objectives and programs.
- 4.3 Audits are designed to achieve the following goals:
- 4.4 To provide the auditee with an opportunity to assess its own SAFETY system standard and identify areas for improvement.
- 4.5 To determine the conformity of the implemented O S & H system with specified requirements and identify areas for improvement and
- 4.6 To meet regulatory requirements.

**The following aims were set for the Audit Team:**

- 1.0 To examine and evaluate the accident prevention measures.
- 1.1 To analyze the safety procedures, systems and practices.
- 1.2 To observe the working conditions and operating methods, including storage/handling of raw Materials/finished products.
- 1.3 To pinpoint occupational health hazard.
- 1.4 To check the adequacy of firefighting arrangements.
- 1.5 To study waste disposal arrangements.
- 1.6 To Comment upon various statutory compliance.

## SECTION 5: SCOPE OF WORK

The scope of this report is restricted to **Solar Industries India Ltd. Village: Chakdoh , Amravati road**. All the departments are audited in the plant as per the audit plan.

The following locations/departments are considered during Audit as thrust area.

- Legal compliance
- Production activities
- HR & Admin
- Maintenance
- Purchase
- Store of Raw Materials and Explosives products
- Environment, Health, Safety and Sustainability (EHSS)
- Security

The following explosives products, accessories and non-explosives products are being manufactured:

Products Name	UOM	Industrial License Quantity /Year	PESO License Quantity Per /Year
Slurry/ Emulsion Explosives	MT	200000	200000
Bulk Emulsion (SME)	MT	125000	125000
Sorbic Monooleate (SMO)	MT	NA	9162
Poly Iso butylene Succinic anhydride (PIBSA)	MT	NA	6000
Lead Azide (Captive)	MT	NA	9
Lead Styphnate (Captive)	MT	NA	3
ASA/AM/APA Mixing & Drying (Captive)	MT	NA	12
Penta Erythritol Tetra Nitrate (PETN)	MT	4500	4500
Cyclotetra Methylene Tetra Nitramine (HMX & HMX compounded Products)	MT	300	300
RDX & RDX compounded Products	MT	3000	3000
Tri nitrotoluene (TNT)	MT	3000	3000
Pentolite Cast Booster	MT	4500	4500
Detonating Fuse	Million meters	225	225
Detonators	Million nos.	150	150
Calcium/Sodium Nitrate	MT	NA	NA
GI/CU Wire coating	Million nos.	NA	90
Filling/ Pressing of Filled Shells (Captive)	Million nos.	NA	63
Shock Tube /NONEL Tube (Captive & Finished)	Million meters	450	300
Microchip (Captive & Finished)	Million nos.	NA	NA

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**SECTION 6: AUDIT METHODOLOGY**

- 6.1. The Indian Standard IS 14489: 2018 is used as basis for this audit.
- 6.2. Safety Audit subjects each area of a company's activity to a critical appraisal of all potential hazards. Every component of the total system is included, e.g. policy attitudes, training, features of the process and design, layout of the plant, operating, emergency plans, personnel protection, accident records etc.
- 6.3 **AUDIT PLAN:** The Audit plan is finalized after consultation with lead auditor and the client and communicated to the auditors and auditee. The audit plan is kept flexible to suit site specifics, in order to permit changes in emphasis based on information gathered during the audit and to permit effective use of resources. The plan includes:

The audit objectives and scope.

- Identification of reference documents (such as the applicable SAFETY System standard and the audit's description and specified requirements of their safety system).
- Size of the audit team.
- Identification of the organizational units is to be studied.
- The schedule for audit activities.
- The schedule of meetings is to be held with audit management.
- The list of documents is to be verified by the audit team
- Audit schedule.
- Working Documents: The documents required facilitating the auditor's investigations and to document and report results include:
  - Checklist used for evaluating SAFETY System elements (normally prepared by the auditor assigned to audit the specific element)
  - Audit evidence copies of the document as supporting evidence.

#### 6.4. ELEMENTS OF OCCUPATIONAL SAFETY & HEALTH SYSTEM

1	Occupational safety and health policy
2	Safety organizational set – up
3	Education and training
4	Employees participation in Safety management
5	Motivational and promotional
6	Safety manual and rules
7	Compliance with statutory requirements
8	New equipment review/inspection
9	Accident reporting analysis investigation and implementation of recommendations
10	Risk assessment including hazard identification
11	Safety inspection
12	Health and safety improvement plan/targets
13	First aid facilities - occupational health center
14	Personal protective equipment
15	Good housekeeping
16	Machine and general area guarding
17	Material handling equipment
18	Electrical and personal safeguarding
19	Ventilation, illumination and noise
20	Work environment monitoring system
21	Prevention of occupational diseases including periodic medical examination
22	Safe operating procedures
23	Work permit systems
24	Fire prevention, protection and fighting systems
25	Emergency preparedness plans (on-site/off-site)
26	Process/plant modification procedure
27	Transportation of hazardous substances
28	Hazardous waste treatment and disposal
29	Safety in storage and warehousing
30	Contractor safety systems
31	Safety for customers (including material safety data sheets)

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6.4	TYPES OF RECORDS EXAMINED DURING THE SAFETY AUDIT
1	Safety policy
2	Safety organization chart
3	Training records on Safety fire and first – aid
4	Record of plant Safety inspections
5	Accidents investigation reports
6	Accidents and dangerous occurrences statistics and analysis
7	Record of tests and examination of equipment's and structures as per statues
8	Safe operating procedures for various operations
9	Record of work permits
10	Record of monitoring of flammable and explosives substances at workplace
11	Maintenance and testing records of fire detection and firefighting equipment
12	Medical records of employees
13	Records of industrial hygiene surveys (Noise, ventilation and levels, illumination levels, airborne and toxic substances, explosive gases)
14	Material safety data sheets
15	On site emergency plans and record of Mock Drills
16	Records of waste disposal
17	Records of effluent discharges to the environment
18	Housekeeping inspection records
19	Minutes of safety committee meetings
20	Approval of layouts from statutory authorities
21	Records of any modifications carried out in plant or process
22	Maintenance procedure records
23	Calibration and testing records
24	Shut down maintenance prcedures
25	In service inspection manuals, records including that of material handling
26	Safety budget
27	Inspection books and other statutory records
28	Records of previous audits
29	Safety in transportation of hazardous substances

Questionnaire of preliminary information about various elements of Safety system is prepared. This is to be filled in by the auditee, and returned to the audit team for study before the field visits.

#### 6.4 KEY ON-SITE ACTIVITIES

Understanding management systems, factory processes, plant organization and responsibilities, compliance parameters and other applicable requirements.

Plant visits discussions with management personnel, supervisors and workers, Discussion with Factory Personnel. Specially designed internal controls questionnaire. Assessing strengths and weaknesses.

Collecting Audit Evidence, Record Reviews and Examination of available Data, applicable codes and standards, detailed plant descriptions such as piping and instrumentation drawings flowchart, plant procedures for start-up, shut down, normal operation and emergencies, personnel injury reports, hazardous reports, maintenance records such as

- Critical instrument checks, pressure relief valve tests, pressure vessel inspections process material characteristics.
- Plant visit observations as the purpose of audit is not to comprehensively check implementation of each safety system element; sample/test check information is collected for the implementation of each elements of the safety system. However, recommendations are not only to correct the observed non-conformities, but the implementation of the element as a whole.
- In order to verify the status of inspection systems at site observations for unsafe conditions/unsafe acts are carried out such as follows:
  - Spillage of oil and material on floor
  - Machinery guarding
  - Poor lighting in some area
  - Excess dust / House keeping
  - Short cuts
  - Not wearing personal protective equipment's
  - Not following safety rules
  - Lack of classroom and on job training

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- Lack of motivation

➤ Evaluating audit evidence, Reporting audit findings

The desired end result of a safety audit is the identification of primarily unrecognized hazards in the light of experience and early recognition of shortcomings in the areas such as the maintenance and testing of critical equipment. These recommendations are of two types: For improvement in the system's specified requirements and for more effective implementation of the specified requirements of the system.

Purpose of the closing meeting with Audittee is to present audit observations and recommendations to the senior management is such so as to ensure that they clearly understand the results of the audit.

**6.5 POST AUDIT ACTIVITIES:** Action plans and follow – up.

**SECTION 7: MANAGEMENT CO-OPERATION**

The Safety Audit Team expresses deep gratitude towards the Management for giving them the opportunity to review the Safety Systems and share in the experience and expertise on this critical subject. This subject is of vital importance for the Welfare and Economic Prosperity of the Organization on the whole. The Management has, at every stage shown a positive approach while participating with Information and while giving facilities to the Team for effectively carrying out the Safety Audit.

Sr. No.	Name of Officers	Designation
1.	Mr. Milind Deshmukh	Occupier
2.	Mr. P. P. Deotare	Plant Head
3.	Mr. M. K. Singh	Head HR & Admin.
4.	Mr. Hemant Tepale	Head Safety
5.	Dr. Sushil Kumar Sharma	EHS /Legal Consultant
6.	Mr. Sujay Kumar	AGM (EHS)
7.	Mr. Dhiraj Rajgure	Manager (Safety)
8.	Mr. Pawan Hiwse	Manager (Safety)
9.	Mr. Shubham Ghuse	Manager (Safety)

Every effort has been made to ensure that all statements and information offered in this report are given in good faith and without bias or prejudice. They refer to conditions prevalent at the time of the Audit. All documents and procedures submitted to the Auditor have been verified. During the Audit no test were conducts nor were any tests started, not was any plant or equipment operated for the benefit of our Audit requirement.

Once again, the Safety Audit Team sincerely thanks the concerned Management personnel for all the courtesy and assistance rendered by them during the course of the above Safety Audit.

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**SECTION 8 : GOOD SAFETY PRACTICES, OBSERVATIONS & COMMENTS****2.2 GOOD PRACTICES & RECOMMENDATIONS****Good Practices:**

1. The entire safety of the factory is operating on the principle of "FISHY"

F – Friction

I- Impact

S- Static

H – Heat

Y – Your Behavioral Safety

This enables management to ensure safety at all times and also to develop safety culture at work place.

2. Good housekeeping in entire plant.
3. Adequate approaches to all plant through mode of access, marking of aisles, work areas.
4. Lot of initiatives for utilization of waste water/ effluents inside plant including gardening.
5. Modern technologies adopted in ETP/STP treatment.
6. Engineering control provided in process to ensure safe operation conditions.
7. Openness of employees for sharing of knowledge & information with respect to safety.
8. Management's support and commitment to ensure safety & injury free working conditions at plant.
9. Availability and retrieval of safety data.
10. Good quantity of tree plantation and green zone development.

The desired end result of a safety audit is the identification of primarily unrecognized hazards in the light of experience and early recognition of shortcomings in the areas such as the maintenance and testing of critical equipment.

These recommendations are of two types:

1. For improvement in the system's specified requirements and
2. For more effective implementations of the specified requirements of the system.

The audit team makes following recommendations to the management of **Solar Industries India Ltd.** to Improve up on the Safety standards.

#### **2.4 AUDIT EVIDENCE**

Records of the evidence collected are maintained at site. After agree upon the Audit findings based on evidences points were finalized.

#### **2.5 ACTION PLAN**

Action on the safety audit report is most important. As the nature of recommendations covers number of aspects of the site activity all cannot be implemented immediately. However, with definite action plan, in a phased manner, the objective can be achieved.

#### **2.6 CONCLUSION**

The management has undertaken systematic safety study program. Environment Management System (ISO 14001-2015) & Occupational Health & Safety System (ISO 45001-2018) certificates obtained from DNV. It is observed that there is satisfactory system for compliance to the statutory requirements. There is regular follow up system towards the compliance of the statutory requirements and fulfilling occupier's obligations. In conclusion the audit team finds the safety standard of the installations is GOOD to ensure the safe operations at site.

#### **2.7 STRUCTURE OF THE REPORT**

The methodology of the SAFETY AUDIT is described in Section 1.5. Audit Questionnaire collected data followed by site visit observations and comments are available in section 8. Compliance of statutory approvals status is described in section 9. The audit Recommendations are in section 1.7 and it is concluded in section 11. The evidence collected is maintained separately at site itself by the company. We appreciate the positive approach shown by the managements and thanks to all staff

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**SAFETY AUDIT QUESTIONNAIRE****C-1 OCCUPATIONAL HEALTH & SAFETY MANAGEMENT****C-1.1 OCCUPATIONAL HEALTH & SAFETY POLICY**

<b>A</b>	Does the organization have a occupational health and safety Policy?	Yes
<b>B</b>	Who has signed the occupational health & safety policy?	Health, Safety & Environment Policy signed by Occupier.
<b>C</b>	Whether the OH & S policy is per guidelines of the statutory provisions?	Yes
<b>D</b>	When was the OH & S policy declared and adopted?	21.10.2021
<b>E</b>	Whether the OH & S policy reviewed periodically?	Yes
<b>F</b>	Whether the OH & S policy is available in local language and made known to all?	Yes
<b>G</b>	What was the last date of updation?	Need to review for updation
<b>H</b>	Does the policy find a place in the annual report?	No

**C-1.1 OBSERVATIONS**

<b>a</b>	Policy found displayed.
<b>b</b>	Policy need to updated with respect to manufacturing process requirement and a regular review mechanism need to set through proper SOP

**C-1.1 COMMENTS**

<b>a</b>	Health and Safety Policy can be circulated as a pocket calendar to all employees to increase awareness in employees.
<b>b</b>	The policy shall be translated in the language (Hindi & Marathi) understood by majority of workers and widely displayed at strategic positions at site.
<b>c</b>	The Safety policy supporting document is like constitution for safety activities and serves the basis during safety Audit. It is suggested that the supporting document should elaborate the details of the

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necessary information specified under the M.F.R.1963, Rule No. 73L (5) in particulars, the manual should specify the following:

- Arrangements for involving the workers,
- Relevant techniques and methods, such as safety audit and risk assessment for periodical assessment of the status on health, safety and environment and taking all the remedial measures.
- Stating its intention to integrate health and safety in all decisions including those dealing with purchase of plant, equipment, machinery and material as well as selection and placement of personnel.

Arrangement for informing, educating and training and retraining its own employees at different levels and the public, whenever required.

## C-2 OCCUPATIONAL HEALTH & SAFETY ORGANIZATION SET UP

### C-2.1 SAFETY DEPARTMENT

a	Does the factory have a safety department and what is strength of safety department?	08 Officers Safety officer needs to be appointed in compliance with rules
b	Whether the strength and qualifications of safety officers are as per the statutes?	08 Officers Safety officer needs to be appointed in compliance with rules
c	Does the head of Safety department report to the Chief Executive?	Yes
d	How often are the safety officers retrained in the latest techniques of total Safety Management? What is the frequency retraining?	Training to be imparted
e	What additional duties the safety officer is required to do?	No extra duties
f	What is the power of safety officer vis-à-vis unsafe condition or unsafe act?	To stop work

### C-2.1 OBSERVATIONS

a	Factory Manager controls the overall operations of the factory. Safety officer is controlling and in advisory support to factory management including monitoring of day – to – day safety activities of the factory.
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**C-2.1 COMMENTS**

- |   |  |
|---|--|
| a | Adequate safety team is appointed to ensure effective implementation of safety management system inside the plant to ensure and maintain Zero Injury & Illness plant status. |
|---|--|

**C-2.2 SAFETY COMMITTEE(S)**

a	Does the factory have a safety committee(s)? What are the types, structures and terms of reference of the committees?	Yes,
b	Is the constitution of the safety committee (s) as per the statute?	Committee available but needs to be formed as per rule 73-J of TMFR, 1963
c	How are the members of safety committee (s) selected? (selected/nominated)	Nominated
d	How often are the meetings of safety committee(s) held?	Quarterly
e	Are the recommendations of the committee(s) implemented?	Through department representative
f	Are the minutes of safety committee(s) meetings circulated among the members?	Yes
g	Are the minutes forwarded to the trade union(s), CEO and Occupier?	Yes, through mail
h	Whether the management and trade union play their active role in supporting and accepting the committee (s) recommendation?	Yes, after discussions and review
i	What are the subjects? Are the problems discussed in the meeting?	Safety Survey, PPE, Unsafe act/ unsafe condition (UA/UC)
j	How are the safety committee(s) members apprised of the latest developments in safety, health and environment?	By Safety officer

**C-2.2 OBSERVATIONS**

- |   |  |
|---|--|
| a | Safety committee needs to be form as per section 41G of the factories Act 1948 and the Maharashtra Factories rule 73J and agenda for safety committee meeting shall be in line with the requirements of The Maharashtra Factories rules, 1963. |
|---|--|

**C-2.2 COMMENTS**

a	An important component of a successful process safety management program is active and informed participation by employees. Employees have uniquely informed perspectives on site processes and situations. Accordingly, employers need to consult with their employees as they develop and implement process safety management program and hazard assessments.
---	---

**C-2.3 SAFETY BUDGET**

A	What is the annual safety budget?	As and when provision is made
B	How much percentage is this budget of the total turnover of the company?	Need to calculate
C	How much budget has been utilized till date?	Need to calculate
D	Is the safety budget adequate?	Management provides funds for safety without any restriction.
E	How is the safety budget arrived at?	Management provides funds for safety without any restriction and with no constraints.
F	What is the pattern of expenditure for the last five years?	Need to calculate
G	What are the approved sanctions for the expenditure in this budget?	PPE purchase, Firefighting equipment, Environment monitoring, Safety Survey/ Safety Audits
H	Does this budget get reflected in the annual report of the company?	Not evident during the audit.

**C-2.3 OBSERVATIONS**

a	Management is taking all measures to make sure to maintain the safety related things in time with proper approvals from top management.
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**C-2.3 COMMENTS**

a	Expenditure on safety activity need to maintain. As and when required adequate provision is made if additional budget required. In fact, there is no constraints for safety related activities.
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**C-3 SAFETY MANUAL**

a	What is the periodicity of updation /review of safety manual?	Safety manual is not made available during the audit.
b	Does the safety manual adequately address all the hazards in the plant?	Hazards are addressed in the departmental activities by Hazard Identification & Risk Assessment (HIRA).
c	Are the employee made aware of safety rules / instruction mentioned in the safety manual?	Yes. Employees are made aware of safety Rules through SOP, Tool box talk.

**C-3 OBSERVATIONS**

a	Safety Manuals is not available.
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**C-3 COMMENTS**

a	Safety Manuals system needs to prepare and all employees made aware about safety rules/ instruction mentioned in the safety manual.
---	---

**C-4 STANDARD OPERATING PROCEDURE (SOPs)**

A	Are written standard/Safe operating procedures available for all operations and processes?	Yes, available
B	Whether the written safe operating procedures displayed or made available and explained in the local languages to the workers?	Partially,
C	Whether concerned section and safety department prepares standard / safe operating procedures jointly?	Yes, but need to signed documents
D	Are standard / safe operating procedures reviewed and update?	Process need to start
E	Have the workers been informed of the consequences of failure to observe the safe operating procedures?	Yes, record to be maintained
F	Whether contractor's workers are permitted on process / operations? Give details.	No

**C-4 OBSERVATIONS**

- |          |   |
|----------|---|
| <b>a</b> | SOPs are available, need to display in Hindi or Marathi at work place. Need adding to safety points in the Standard operating procedures. |
|----------|---|

**C-4 COMMENTS**

- |          |   |
|----------|---|
| <b>a</b> | Safe operating procedures (SOPs) provide the basis for coherent, safe site operations by Supporting safety in day-to-day activities and in operator training programs. SOPs describe site access, process startups and shutdowns during routine and emergency operations, lockout and tag out, confined space entry, opening process equipment or piping, storage, handling, loading and unloading. SOPs addressing operating.  |
| <b>b</b> | Parameters should include operating instructions about pressure limits, temperature ranges, flow rates and steps on how to handle process deviations. Furthermore, SOPs should be reviewed as necessary to ensure that they reflect current operating practices and that current information is transmitted as part of employee training. Introduce formal safe procedure for any change in process.  |
| <b>c</b> | <p>It may be noted that at section 2(1) of the Factories Act, a contract workman is to be treated as per with the regular employees as far as the safety and health is concerned. As the contractors have to perform work around the processes that involve hazard there is need to include the contractors in the site safety management chain. Special efforts must be made to screen contractors appropriately and to assure that contractor employees receive up-to-date training and emergency procedure information.</p> <p>The following activities should be conducted as appropriate:</p> <ul style="list-style-type: none"> <li>➤ Informing to contractors about potential of fire, accident hazard</li> <li>➤ Explaining to contractor about the applicable provisions of the site emergency plan.</li> <li>➤ Developing work practices to control the entrance, presence and exit of contractors in process areas.</li> </ul> <p>Providing and documenting* contract employee training and evaluating the performance of contractors in fulfilling their obligations.</p> |

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**C-5 PLANT MODIFICATION PROCEDURES**

a	What is the system for effecting any change in the existing plant, equipment or process?	SOP need to prepare
b	Whether the P & I diagram and other related documents are updated accordingly?	Review mechanism need to develop
d	Whether hazard assessment done before implementation of modification?	Yes, JSA done

**C-5 OBSERVATIONS**

a	The Procedure related to modification in plant, hazard assessment done before implementation of modification is available.
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**C-5 COMMENTS**

a	Process need to develop whenever the modification is done in plant for effecting any change in the existing plant, equipment or process and hazard assessment done before implementation of modification and P & I diagram and other related documents needs update accordingly.
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**C- 6 WORK PERMIT SYSTEM**

A	What types of work permits exist in the factory?	Hot work, Electrical work, Height, Digging & Excavation, Confined space permits are in use.
B	Are the necessary forms detailing required safety precautions have been prepared and used for each type of work- permit?	Yes
C	Is the responsibility assigned to authorized person for issuing of safety work permit?	Yes
D	Is the copy of safe work permit sent to safety officer before execution of the job?	Yes

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E	Is validity period specified in the safety work permit?	Yes
F	Are the records of work permit available and maintained in proper order?	Yes /Work Permit Sample

**C-6 OBSERVATIONS**

- a The Procedure related to modification in plant, hazard assessment done before implementation of modification is not available.

**C-6 COMMENTS**

- a Process need to develop whenever the modification is done in plant for effecting any change in the existing plant, equipment or process and hazard assessment done before implementation of modification and P & I diagram and other related documents needs update accordingly.

**C-6.1 Control Measures for Work at height**

A	Is adequate safe access provided to all places where workers need to work?	Yes
B	Are all such access in good condition?	Yes
C	Are all scaffolds are properly designed and erected?	Yes, need to get certify before use
D	Are scaffolds inspected every day before work begins?	Need to start
E	Are ladders securely clamped or lashed in place?	Yes
F	Are planks in good condition?	Yes
G	Are scaffold walkways, platforms, runs or stairs free of debris, grease any unnecessary obstruction and projecting nails?	Yes
H	Are the scaffolds higher than 20 m? If yes, is a netting or intermediates railing provided between toe-boards and hand railing?	NA

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I	Are folding stepladders properly used?	Yes
J	Are ladder set up at the proper slope of about 1:4?	Yes
K	Do workers use hand lines to lift tools or materials?	Yes
L	Are proper ladders used around electrical hazards?	Yes
M	On sloping roofs, are crawling boards, lifelines, safety belts and edge protection provided where needed?	NA
N	Whether the weak spots, skylights, or deteriorated asbestos- cement boards through which a worker might fall while working in the roof has been identified and safety net provided appropriately?	Safety net need to provide
O	Are the workers being medically examined for their fitness to work at height?	Yes

**C-6.1 OBSERVATIONS**

a	All practicable measures need to be taken for work at height.
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**C-6.1 COMMENTS**

b	Necessary PPEs such as full body safety Harness and Proper access platform need to be provided for work at height.
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**C-6.2 WORK IN CONFINED SPACE**

A	Is work permit system followed for working in confined space?	Yes
B	Whether monitoring of the atmosphere inside the confined space is carried out and ensured that there is no flammable or toxic gas in the area?	NA

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C	Whether the person entering the confined space is using suitable personal protective equipment (PPE)?	NA
D	Is rescue team is available in case of emergency?	NA

**C-6.2 OBSERVATIONS**

a	Works permit system for working in confined space is available. It needs to be reviewed.
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**C-6.2 COMMENTS**

a	Work permits to be reviewed periodically.
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**C-7 CONTRACTORS SAFETY SYSTEM**

A	Is there any system for selection of contractors?	Yes
B	Are there any guidelines on contractor's safety and training?	Yes
C	Whether contact document includes necessary safety and welfare clause as per status?	Yes, Clause related to supply of PPE and uses of stipulated PPEs mentioned in work order.
D	Is there any programme to ensure use of PPE by contractors' personnel?	Yes, Provided by Company, Tool box talk is provided by the company to contract employees
E	Do the contractors have their own safety organization?	No. All the work is supervised by company safety supervisors/safety officer
F	Are the contractors reporting all accidents and injuries?	Yes
G	Are contractors' workers trained to observe safety at work place?	Yes
H	Whether contractors' workers are engaged in process/operation? If yes, are they aware of safe operating procedure?	Yes, R- 73 H

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**C-7 OBSERVATIONS**

a	Contractor Safety system needs to improve for safe working for all contractor workers.
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**C-7 COMMENTS**

a	Management needs to ensure no contractor workmen to be deputed in process as per R-73 H (1) (b) of TMFR 1963.
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**C-8 PLANT DESIGN AND LAYOUT**

A	Whether hazardous operation in the plant are segregated?	Yes, Layout approved by DISH & PESO
B	Whether occupational health & safety aspects are considered during the design?	Yes
C	Are all the equipment provided with adequate space for working maintenance etc.	Yes
D	Are the storage tanks provided with enough space clearance between them?	Yes, needs to be maintained
E	Whether the plant layout has taken care of the movement of firefighting equipment and emergency exits?	Yes, access roads to be provided

**C-8 OBSERVATIONS**

a	Contractor Safety system needs to improve for safe working for all contractor workers.
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**C-8 COMMENTS**

b	Management needs to ensure no contractor workmen to be deputed in process as per R-73 H (1) (b) of TMFR 1963.
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**C-9 MEDICAL MANAGEMENT OF ACCIDENTS**

<b>A</b>	Are medical facilities available with trained first aid staff and equipment in round the clock shift for all including contractors?	Yes, OHC shall be in conformity with the Rules
<b>B</b>	Is the ambulance van available for round the clock basis with the dedicated driver?	Yes,
<b>C</b>	Is there any mutual aid scheme available with the nearest hospitals to manage and treat injuries during emergency?	No
<b>D</b>	Are the workers/contractor workers aware of emergency medical facilities?	Yes,

**C-9 OBSERVATIONS**

<b>a</b>	Certified First aider needs to be developed inside plant for medical emergency.
<b>b</b>	The contact details of certified first aider and fire fighters needs to be displayed.

**C-9 COMMENTS**

<b>a</b>	In spite of all the preventive efforts, accidents result in injuries at work places cannot be totally ruled out. Administration of timely first aid minimizes the subsequent complications hence first aid becomes essential; first aid boxes need to be maintained in proper conditions.
<b>b</b>	Notices should be displayed near first aid appliance and at a conspicuous place mentioning, the names of all the persons trained in first aid. The work room where these persons are available and the name of the nearest hospital and its telephone number.

**C-10 MANAGEMENT OF EMERGENCIES (NATURAL/ MAN-MADE)**

<b>A</b>	Does the system exist to detect and control these emergencies?	Yes
<b>B</b>	Are the employee aware of the measures to be taken during emergencies?	Yes

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**C-10 OBSERVATIONS**

a	Updated On-site emergency plan hard copy to be kept available at main gate and in all sections.
b	The best available technology is adopted to the extent possible in design, installation, and operation and maintenance of different processes, plant equipment and machinery. Despite all precautions, accidents can happen at times. In order to face such situations and also to prevent loss of human life and property, the plant has prepared with emergency and disaster control plan. The emergency control center and assembly points are specifying.

**C-10 COMMENTS**

a	Mock drills and exercises supplement training and allow each employee to understand more clearly what steps to take in case of an emergency. Testing emergency procedures, such as evacuation routes, internal/external alert systems and community coordination, enhances response time and demonstrates whether the procedures are viable in an emergency. Drills and exercises generally cover evacuations, firefighting and medical and rescue operations; field's response to a hazardous materials event may also be addressed, although generally with somewhat lesser frequency.
b	<p>The company should consider following measures for effective disaster control planning.</p> <ul style="list-style-type: none"> <li>• Tabletop exercises should be carried out regularly before Mock drill exercises.</li> <li>• Consider Public address system for effective communication at site.</li> <li>• Consider evacuation and head count exercise during Mock drill</li> <li>• Consider display of boards for escape routes especially for the persons not connected with site activity using the common roads.</li> <li>• Maintain copy of "On Site Emergency Control Plan" at plants especially at security.</li> </ul>
c	<p>The main function of the Security Department is to contain losses due to pilferage, theft, Vandalism and industrial espionage both by employees and by outsiders. The vehicles are checked by security and record maintained at gate.</p> <p>The security needs to train in Emergency Handling Operations.</p>

**C-11 EMPLOYEES SELECTION AND PLACEMENT**

A	Whether norms are available for selection of different category of employees?	Yes
B	Whether pre-employment medical examination is being conducted for employees?	<p>Yes, it has been followed for the officers.</p> <p>Need to start for workers.</p>
C	Is there any procedure to evaluate safety awareness and record of the employees during their promotion?	Yes

**C-11 OBSERVATIONS**

a	The process for Pre-employment medical examination of employee is available.
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**C-11 COMMENTS**

a	Medical examination of employees once in a year found done as per TMFR, 1963.
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**C-12 SAFETY CULTURE****C-12.1 Attitude of Manager**

A	Do the manager follow the plant safety rules at all times?	Yes
B	What are their attitudes towards safety review and audits?	Positive
C	What is the response of management to safety violation?	CAPA through department implemented
D	Whether safety related decisions are taken in consultation with the workers?	Yes
E	What is the attitude of the managers towards nonuse of personal protective equipment?	Awareness initiated on employees

**C-12.1. OBSERVATIONS**

a	Safety culture and awareness of worker related to safety at work place needs to increase.
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**C-12.2. COMMENTS**

a	Safety rules, safety culture and manager attituded towards PPEs use needs to be increase.
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**C-12.2 Attitude of Workers**

a	Whether workers are aware of the consequences of their wrong actions?	Awareness need to increase
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b	Are laid down safe working procedures followed strictly?	Monitoring required
c	What is the attitude of the workers towards their own mistake, which can prejudice safety?	Need to improve
d	Do the workers report near miss incidents and suggest safety improvements?	Yes
e	Are the workers aware of the system of rewards and sanctions relating to safety matters?	Need to be implemented
f	What is the attitude of workers towards use of PPEs?	Awareness to be given

**C-12.2 OBSERVATIONS**

a	Safe working procedure to be followed, BBS Survey needs to be carried out
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**C-12.2 COMMENTS**

a	Attitude of workers towards use of PPEs needs to increase and insisted their use upon.
b	Workers reports near miss incidents and suggest safety improvement.

**C-13 STATUTORY LICENSES, APPROVALS AND RECORDS**

A	Whether all the safety related Acts/ Rules (with latest amendments) applicable to your organization identified, informed to all employees and complied?	Yes
B	Whether the licenses have been validated?	Yes

**C- 14 MOTIVATIONAL AND PROMOTIONAL MEASURES FOR OH & S**

a	Does the factory have OH & S suggestion scheme?	Yes
b	Are occupational health and safety contests organized in the factory?	Yes
c	Does the factory participate in National awards?	Yes

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d	Has the factory been awarded during last five years?	
e	Does the organization publish safety bulletin/newsletters?	Internal Circulated
f	Whether the safety bulletins are widely distributed?	Yes
g	How is the occupational health and safety information including accident statics disseminated in the factory? (Bulletin boards, Newsletters etc.)	Board
h	What are the activities conducted during National Safety day / week?	4 <sup>th</sup> March 2023
i	What is the percentage of workers participating in the various safety promotional activities?	Yes

**C-14 OBSERVATIONS**

a	Safety posters are found displayed at prominent places to educate the employees about the hazards in that particular workplace and measure need to be taken to protect themselves from the hazards.
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**C-14 COMMENTS**

a	The shop floor serves the purpose of on job communication where the trained supervisors in turn train their teams.
b	The practice of five-minute safety talk should be started for contractor employees including contractor workmen at regular intervals. The trust is being correct use of PPE, emergency procedures and housekeeping
c	Safety information by various means can influence attitude and behavior patterns provided it forms an integral part of the overall Safety program and are not just 'Lip Service'. Job specific safety posters, slogans can be displayed and rotated at frequent intervals
	Internet facility is available to all departments wherefrom safety information is sought.

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**C-15 HAZARD IDENTIFICATION AND JOB SAFETY ANALYSIS**

<b>A</b>	Was an initial process hazard analysis (PHA) completed?	Yes.
<b>B</b>	What are the stages of PHA? Whether a dedicated group is identified for PHA?	Yes
<b>C</b>	Was the PHA appropriate for the complexity of the process and identify, evaluate, and control the hazards involved in the process?	Yes
<b>D</b>	Does the hazard evaluation use one or more of the following PHA methodologies? What- If – Analysis, Process checklist, hazards and operability study (HAZOP), Failure mode and effects criticality Analysis (FMECA). Fault tree Analysis (FTA) or any other appropriate equivalent methodology?	HIRA, JSA
<b>E</b>	Does PHA assures addressing issues inherent safety features with respect to material and their properties?	Yes
<b>F</b>	Does the PHA address the hazard identification, incidents history, consequences of failures (engineering and administrative controls), human factors, consequents analysis with respect to possible safety and health effects of failure of controls?	Yes, through Change Management
<b>G</b>	What are the stages of PHA? Whether a dedicated group is identified for PHA?	Yes
<b>H</b>	Does the system exist to promptly address findings and recommendations of PHA?	Yes

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I	Are the PHA's update and revalidate at least every five years by a qualified team to assure that the PHA is consistent with the current process?	Yes, Frequency to basic
J	Whether the activities requiring job safety analysis have been identified?	Yes
K	Whether the identified jobs for Hazard identification have been carried out by trained and experienced person?	Yes
I	Whether the checklists have been prepared on each job safety analysis and are being while carrying out the job?	Yes

**C-16 PRODUCT SAFETY**

A	Whether hazards arising from use of the products are identified?	Yes
B	Whether material safety data sheet prepared for the products?	Yes
C	Are all the products labeled and packed appropriately?	Yes (Explosives Rules 2008 followed)
D	Whether safety instructions are given along with products?	Yes
E	Whether policy exists for recall of products?	No

**C-16 OBSERVATIONS**

a	Storage of highly inflammable chemicals like, Solvents and corrosive chemicals like acids shall be stored in isolated area.
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**C-16 COMMENTS**

a	SOP found prepared and displayed in local language.
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b Safety instruction needs to be displayed along with handling of material.

### C-17 SAFETY TRAINING

A	Whether training needs have been identified?	Yes
B	Is there any program of induction training, its duration and topics covered?	02 Hours, Basic & Product Safety
C	Whether the assessment of the trainees has been carried out?	Yes by HOD
D	What are the infra – structural facilities available for training?	Training Room, Projector Technical Training Center available
E	Whether training is conducted by qualified person?	By Safety Department
F	Whether trainers are being re-trained from time to time?	Yes
G	Whether proper records of training program conducted are maintained?	Yes
H	How training programs are evaluated?	Through HOD & Plant Head
I	Whether schedule for training on occupational health and safety is available and maintained?	Yes
J	Whether the training programme are reviewed?	Yes
K	Are all the employees periodically trained/ retrained and what is the frequency of such training?	Yes
L	Are the retraining needs identified whenever a new process/product and change in existing process introduced?	Yes, through MOC
M	Whether training covers top management?	Yes
N	How many hours of safety training is given to different employees?	25 topics are identified mandatory terms and retraining to the employees

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**C-17 OBSERVATIONS**

a	There is a requirement to provide other safety trainings regularly including specialized training like Legal Requirement, JSA, risk assessment, material handling, on site emergency plan awareness scan be covered in annual training program. Also, record of training needs to be maintained.
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**C-17 COMMENTS**

a	It is recommended to prepare annual safety training calendar for all categories of employees.
b	Training need identification, training record, feedback, training evaluation needs to be developed at plant level.
c	Training of supervisory and operations personnel provides the most immediate opportunity to increase awareness on work places and ensures the competence of employees in performing their responsibilities. Training programs are the key to ensuring the effectiveness of maintenance programs, process and handling of materials. Legal requirements, working at height, housekeeping, firefighting and emergency response. Refresher training ensures that established employees are reminded of appropriate procedures periodically and of alterations that have occurred. To minimize the risk of accidents occurring because employees are unfamiliar with their assigned tasks, a successful training program for employees and contractors/casuals' workers are require to be conducted in specific in the plant. Initial and refresher training for all employees to confirm that all employees to confirm that all employees are competent to do their jobs safely; additional training after any change is made to the process or to the site overall; and formal documentation.
d	The audit team suggests that the higher-level employees should be sent for training, seminars organized by external safety institutions like DGFASLI. It is suggested that the training calendar should include the training program for contractor employees also.
e	The accidents are likely to happen due to human failure, failure to involve proper and safe system, failure to comply with safe practices, ignorance of Safety Rules etc. The need is therefore to create and maintain a safety culture. In order to create such a climate there is a need for continuous safety education at all, right from management to supervisors and workers.
f	The training programs should be updated in light of any new regulatory requirements. It is encouraged to have the training program that illustrates hazardous chemical handling hazards, topics such as hazard communication, emergency response and chemical hazards, mock drill which is given using video presentation and answer sessions.

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**C-18 CHANGE MANAGEMENT****C-18.1 Management of change**

<b>A</b>	Are there written procedures for managing change to process chemicals, technology, equipment and procedures and changes to facilities that affect the plant process/system operation?	Yes
<b>B</b>	Do the procedures assure that the technical basis for the proposed change addressed prior to any change?	Yes
<b>C</b>	Do the procedures assure that the impact of the change on safety and health addressed prior to any change?	Yes
<b>D</b>	Do the procedures assure that modifications to operating procedures are addressed prior to any change?	Yes, adherence shall be done
<b>E</b>	Do the procedures assure that the necessary time period for the change is addressed prior to any change?	Yes
<b>F</b>	Do the procedures assure that the authorization requirements for the proposed change addressed prior to any change?	Need to add for legal requirements
<b>G</b>	Are employees involved in operating a process and maintenance and contract employees whose job tasks will be affected by change informed of trained in, the change prior to the start-up of process or affected part of process/operations?	Yes
<b>H</b>	Is the safety information is reviewed and updated on change?	Yes, SOP revision need to be carried out after such change.
<b>I</b>	Are the operating procedure or practices updated?	Yes

**C-18.1 OBSERVATIONS**

- |   |  |
|---|--|
| a | The process is available for any change in name, chemicals or address and any miscellaneous changes. |
|---|--|

**C-18.2. COMMENTS**

- |   |   |
|---|---|
| a | Process needs to start for any change in name, Chemicals or address and safety information is reviewed and updated. |
|---|---|

**C-18.2 Mechanical Integrity**

<b>A</b>	Does the mechanical integrity program include for all mechanical equipment including pressure vessels and storage tanks, piping and components, relief devices and vent system, emergency shutdown system, pump, control system?	Study needs to be conducted
<b>B</b>	Are there written procedures to maintain the ongoing integrity of process equipment?	SOP need to be prepared
<b>C</b>	Whether training been provided to each employee involved in maintaining the ongoing integrity of process equipment?	Training on this topic need to be started.
<b>D</b>	Are inspection and tests performed on each item of the process equipment included in the program?	No
<b>E</b>	Does the inspection and test frequencies meet the manufactures' recommendation and good engineering practices?	Need to start
<b>F</b>	Are inspections and tests performed more frequently if determined necessary by operating experience?	Need to start
<b>G</b>	Are deficiencies in equipment's that are outside limits corrected before further use so as to assure safe operation?	Yes
<b>H</b>	In the construction of new plants and equipment's whether quality assurance programme is	Yes

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	Implemented to ensure that equipment fabricated is suitable for the process?	
I	Are appropriate checks and inspections made during equipment installation stage?	Yes,
J	Are the stability of maintenance materials, spare parts and equipment ensured during maintenance?	Yes

**C-18.2 OBSERVATIONS**

a	Inspection and checking of equipment before start to process is done on regular basis.
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**C-18.2. COMMENTS**

a	All equipment's which are used in manufacturing process needs to be checked before use of effective working and record to be maintained.
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**C-19 PHYSICAL HAZARD****C-19.1 Housekeeping**

a	Are all the passages, floors and the stairways in good condition?	Yes
b	Is glass door taped or otherwise marked to make it visible to workers?	Yes
c	Do you have the system to deal with the spillage?	Yes, need to be maintain
d	Do you have sufficient disposable bins clearly marked and whether these are suitably located? Are containers of refuse (waste) and trash emptied at the end of every day or soon after they are full? Are the containers or bins regularly cleaned?	Needs to be provided
e	Are drip trays positioned wherever necessary?	Yes

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f	Do you have adequate localized extraction and scrubbing facilities for dust, fumes and gases? Please specify.	Yes
g	Whether walkways are clearly marked and free from obstruction?	Yes
h	Do you have any inter-departmental competition for good housekeeping?	No
i	Has your organization elaborated good housekeeping practices and standards and made them known to the employees?	5-S activity is being followed in the plant
j	Are there any working conditions, which make the floors slippery? If so, what measures are taken to make them safe?	Yes, CAPA need to be implemented
k	Does the company have adequate measures to suppress polluting dust arising out of materials stored on the roadside?	Yes, as approved by MPCB

**C-19.1 OBSERVATIONS**

a	The roads, plants and surroundings are maintained in neat and clean condition.
b	Housekeeping found maintained at shop floor.
c	Color coding system need to develop for identification of type of waste disposal [Non-hazardous/hazardous] as per specified category.

**C-19.1 COMMENTS**

C-18.6	The over all housekeeping of the factory found in good condition. Inter département compétition can be plan for further improvement's.
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**C-19.2 Machine and General Area Guarding**

a	Whether machinery and equipment which can cause physical injuries to operator have been identified?	Survey needs to be carried out
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b	Are all moving parts and point of operation of machinery adequately guarded?	Needs to be guarded
c	Are all fixed guards securely bolted in position and in good condition?	Check sheet to be used
d	Are all interlock guards for prevention of physical injury in good condition?	Needs to be provided and checked
e	Are all emergency stop buttons effective and clearly labeled?	Yes, need to check regularly
f	Are the operators for machines having moving parts aware of the danger of working with loose clothing?	Yes
	Are the openings where there is free fall hazard covered or fenced securely?	Need to be guarded

**C-19.2 OBSERVATIONS**

a	Machinery and Equipment needs to be securely guarded.
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**C-19.2 COMMENTS**

a	All machinery and equipment to be securely guarded to avoid trapping of body part of worker working near machinery.
b	Tight clothing to be compulsory to all worker working near machinery.

**C-19.3 Material Handling**

a	Are adequate equipment available for handling material?	Yes, need to be maintained
b	Are the workers aware of the hazards associated with material being handled?	Training to be provided
c	Where manual handling is necessary, are the workers been trained? Do they practice this? Are workers warned for lifting of excessive weight? (Maximum weight of material for adult male and female are 55 kg and 30 kg respectively)	Yes, posters need to be displayed for awareness

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d	Do workers follow safe procedures for storage of materials?	Training to be provided
e	Is the register maintained to record particulars of examination of all lifting machines, tools and tackles?	Yes
f	Are all the statutory examinations and tests carried out and certified by competent person(s)?	Yes
g	Are the operators of crane, lifts, hoists and other mechanized operations adequately qualified?	Yes
h	Is the safe working load clearly marked?	Need to mark
i	Has the person employed to operate crane, forklift, or to give signals to crane been medically examined for eyesight and colour vision?	Yes
j	Is the frequency of eyesight and colour vision examination as per the latest rules?	Yes

**C-19.3 OBSERVATIONS**

a	There is a process for induction and job safety training program at site for contract workers also.
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**C-19.3 COMMENTS**

a	SOP for material handling need to display at material storage areas in local language
b	Induction training needs to be provided to all contractor work men for material handling.
c	PM schedule is prepared & adhered by maintenance department

**C-19.4 Electrical Safeguarding**

a	Are licensed electricians available for electrical work?	Yes,
b	Whether area classification for electrical equipment has been carried out?	Yes,
c	Do the electrical fittings conform to area classification for electrical equipment?	Yes

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d	Is a ground fault current interrupter system (ELCB) in use?	Yes
e	Are all connection made by using appropriate plug, receptacle or enclosures? Are fuses provide?	Yes, in some areas domestic plugs are provided shall be replaced with industrial plugs.
f	Are there any make shift connection bare wires or damaged cables?	Yes
g	Is there a system of ensuring periodical inspection of hand tools, extension boards used for electrical work?	Not evident during the audit.
h	Do the workers use proper types of PPEs during the working on live line?	Yes
i	Is the separate work permit issued for working on high voltage line?	Yes
j	Whether the process (s) and equipment that generate and accumulate static charge have been identified?	Yes
k	Whether all such equipment including pipelines for flammable materials are properly bonded and earthed?	Yes, painting found done on earthing strips and due to paints continuity of earthing may get disconnected, care shall be taken while painting.
l	Whether earth pit resistance is measured and the records maintained?	Yes
m	Whether lightning arrestor has been installed and is adequate?	Yes

#### C-19.4 OBSERVATIONS

a	Hazards of static electricity need to identify for all the work areas. Continuity need to maintain at earthing cables and flange connections and earthing for piping carrying flammable materials to eliminate the built of static electricity charge is seen at the site installations. Static charge dissipating plates shall be installed in the hazardous areas and
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**C-19.4 COMMENTS**

a	All electrical fitting to be of approved flame proof type
b	Ensure by regular inspection the earthing continuity.

**C-19.5 Safety in storage and Warehousing**

a	Whether the material Safety data Sheet for all chemicals is available?	Needs to be displayed in local language.
b	Are the chemicals stored as per their hazardous properties including the incompatibility?	Study needs to be conducted
c	Are all containers clearly, indelibly labelled? Are all chemicals stored as per safety regulations?	Yes
d	Whether all racks and steel cages have sufficient load bearing capacity?	Yes
e	Is adequate natural ventilation provided to store room? Is there any emergency exit?	Yes
f	Whether adequate firefighting arrangement existing in flammable chemical storage?	Needs to be provided
g	Whether methodology for handling spillages of hazardous chemical available along with the equipment required handling the spillage?	SOP need to be prepared
h	Whether aisles are marked and emergency exists displayed?	Need to mark

**C-19.5 OBSERVATIONS**

a	MSDS comprising Physical appearance, Health Hazard, Fire Hazard, First Aid, and PPEs are displayed in local language at the point of storage. However, same shall be provided at the point of use.
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## C-19.5 COMMENTS

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a	Adequate firefighting system needs to be provided in hazardous areas.
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## C-19.6 Hazard Assessment for New Equipment

a	What is the system for effecting and change in the existing plant equipment?	Change Management SOP available
b	Is there system for evaluating hazards from new equipment's?	Yes
c	Whether the P & I diagram and other related documents are updated accordingly?	Yes
d	Is any Job Hazard Analysis (JHA)?	Yes

## C-19.6 OBSERVATIONS

a	Any change is affected after new installation or new construction, revised factory plans and Layout plans are already approved or submitted for approval from the concerned authority.
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## C-19.6 COMMENTS

a	Adequate System need to develop for regularizing any change in the existing plant, equipment or process.
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## C-19.7 Hazards from Radiation Sources

a	Whether licenses have been obtained for storage / handling of radioactive material?	NA
b	Whether approved Radiological Safety Officer appointed?	NA
c	Whether appropriate PPEs are used against radiation hazards?	NA
d	Is the flooring of the radioactive material handling area amenable for proper decontamination?	NA

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e	Is the storage room of radiation source as per the license condition?	NA
f	Are all persons working in the facility have radiation safety training?	NA
g	Is the operators handling devices using radioactive materials qualified and possess the necessary certificate?	NA
h	Is the periodical radiation monitoring carried out?	NA
i	Are the records of inventory of radioactive material maintained in the standard format and submitted to the competent authority as per the period specified?	NA
j	Are emergency handling tools available?	NA
k	Are the personnel monitoring badges (TLD, Pocket, dosimeter etc.) assigned and worn by each radiation worker?	NA
l	Are the radiation symbol and red light displayed as required?	NA

## C-20 CHEMICAL HAZARD

### C-20.1 Transportation of Hazardous Substances

a	What potentially hazardous material are transported to or from the site (including wastes)?	As per MPCB consent Hazardous waste transported by CHWTSDF vehicle.
b	What mode of transport is used?  1) Road  2) Rail, and  3) Pipelines	By Road,

**1. Road**

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I	Does the company employ licensed vehicle of its own / outside sources?	Yes, Explosive vans approved by PESO
II	Are the loading / unloading procedures in place and safety precautions displayed?	Yes
III	Is there a provision to check the healthiness of road tanker with respect to explosives rule?	Yes
IV	Are loaded tankers or trucks parked in a specific area on-site?	Yes
V	Do all truck and tanker drivers carry TREM Card or instruction booklet?	Yes
VI	Do all truck and tanker drivers get training in handling emergencies during transport?	Yes
VII	Are all the tankers marked for proper Hazchem code?	Yes

**1.1 OBSERVATIONS**

a	Loading / Unloading procedures need to display in local language at vehicle movement areas
b	Regular training to security team need to be provided for proper monitoring and handling of emergency due to flammable / hazardous material inside plant.

**1.1 COMMENTS**

a	It is suggested that the hazardous chemical unloading checklist needs to be prepared and adhered.
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**2. Rail**

i	What hazardous materials are transported by rail?	Not applicable
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ii	Does the company have a direct siding on-site?	Not applicable
ii	Are tankers or other wagons used in transportation?	Not applicable

### 3. Pipelines

i	What materials are transported to and from the site by pipelines?	Not applicable
ii	Are the pipelines underground or over ground?	Not applicable
iii	Are corrosion protection measures employed in pipelines?	Not applicable
iv	Whether intermediate booster pumps are used?	Not applicable
v	What is the maximum, minimum and average transfer rates?	Not applicable
vi	Are the pipelines extended in the public domain?	Not applicable
vii	Are the pipelines dedicated for each type of chemicals?	Not applicable
viii	Are the pipelines fitted with safety equipment such as leak detectors, automatic shut-off valves etc.?	Not applicable
ix	What is the frequency and method of testing of the pipelines?	Not applicable
x	Is there written procedures for tackling leakages in pipelines?	Not applicable

### C-20.2 Handling of Hazardous Substances

a	What is the hazardous substance handled in the factory?	List is enclosed
b	Whether quantity of hazardous substance is above the threshold limit specified in the manufacture, Storage and Handling of hazardous substances Rule, 1989? If yes, then required documentation is available as per the rule.	Yes

c	Whether written procedure for handling the hazardous substances is available and operators are trained for handling such substances including actions required in case of leakages and spillages?	YES
d	Are the employee aware of the hazards arising from hazardous substance and safety precautions to be taken during handling of these?	YES

### C-20.2 OBSERVATIONS

a	There is storage facility for storage of hazards chemicals
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### C-20.2 COMMENTS

a	Chemicals listed in the schedule above threshold limit specified in the manufacture, Storage and Handling of hazardous substances Rule, 1989, site notification shall be obtained for the same as industry is in MAH category.
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### C-20.3 Material Safety Data Sheet (MSDS)

a	Are the material safety data sheets available for all the chemicals handled, used and manufacture in the factory?	YES
b	Whether the latest MSDS are displayed at strategic locations?	YES
c	Is it available in local language?	At some places available in Hindi as well in English. Need to be provided in local language if required

### C-20.3 OBSERVATIONS

a	MSDS available in English and Hindi language
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**C-20.3 COMMENTS**

a	MSDS needs to be prepared and displayed in local language for material handling if required.
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**C-20.4 Spill Control Measures**

a	Whether spill control procedure is available?	YES
b	Whether spill collection pit / sump is available at the workplace?	YES
c	Whether methodology for recovery / disposal of collected material has been established?	YES

**C-20.4 OBSERVATIONS**

a	Spill control procedure is available.
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**C-20.4 COMMENTS**

a	SOP needs to be displayed for collection of hazardous waste
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**C-20.5 Storage of Hazardous Substance**

a	Whether storage vessels are identified with the capacity as required under MSIHC, Rule 1989?	Yes
b	What are the storage pressure and temperature?	Ambient
c	Whether vessels are above ground / underground?	Above ground
d	If any of the tanks storing flammable materials, whether electrical equipment and fittings are as per electrical area classification?	Yes
e	Is the bunded area takes into account the total quantity of the largest tank?	Yes, acid storage tank
f	Whether the bund perimeter takes into consideration of trajectory of leak from tank?	Yes

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g	Are the vessels properly bonded and earthed and whether periodically checked and record maintained?	No
h	Are the vessels fitted with remotely controlled isolation valves?	Yes
l	Are vessels provided with emergency vent, relief valve, bursting disc, level indicator, pressure gauge, overflow line?	Atmosphere
j	Where do such vents discharge?	Yes
k	Are the vessels provided with alarms for high level, high temperature and high pressure?	Yes
l	Are standby empty tanks or any other alternate systems provided for emptying / transfer in case of emergencies?	Yes
m	What are the provisions made for firefighting / tackling emergency situations around the storage vessels?	Needs to be provided
n	Has any consequences analysis for loss of containment been carried out?	Need to prepare
o	Whether the vessels are tested as per statute?	Need to be done from competent person
p	Whether log sheets are filled up on daily basis for recording the parameter of these vessels?	Yes
q	Whether monitors for detection of leakage of flammable / toxic material installed?	NA

### C-20.5 OBSERVATIONS

a	Firefighting system is available.
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### C-20.5 COMMENTS

a	Vessels and acid storage bonded and earthed and whether periodically checked and record maintained
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## C-20.6 Gas Cylinders

a	Whether the chemicals stored are as per their compatibility?	Need to be stored
b	What are the various gas cylinders used in the plant?	Oxygen, Nitrogen, LPG and Hydrogen cylinders at R & D Lab
c	Are valid licenses available for storing all these cylinders?	NA
	Are the cylinders stored and segregated as per their compatibility?	Though license is not required but to be handled and used as per Gas Cylinder Rules
d	What are the measures taken for combating any emergency in the cylinder's storage area?	OEP needs to be prepared
e	Whether integrity test certificates are obtained from the suppliers of the cylinders?	Supply from authorize dealer
f	Are the cylinders chained and secured properly along with the valve caps and proper identification colour code?	Needs to be done
g	Are the cylinders protected from heat or sun and rain?	Needs to be protected
h	Whether monitors for detection of leakage of flammable / toxic gas installed?	Hydrogen leak detector need to be installed.

## C-20.6 OBSERVATIONS

a	Cylinders are stored in dry place away from direct sunlight.
b	Gas cylinders shall be stored as per the legal condition even if license requirement is not there.
c	Proper stacking in upright position need to be done for Filled & empty both cylinders

## C-20.6 COMMENTS

a	Store cylinders with valve caps in place, even when empty.
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**C-20.7 Labeling and Colour Coding**

a	Are all the container, vessels and storage tanks labeled for its content and capacity?	YES
b	Whether the pipelines are colour coded as per IS 2379?	YES
c	Is any plant specific colour code followed?	Approved by PESO & DISH
d	Whether the colour codes are displayed conspicuously in the working areas?	YES

**C-20.8 Hazardous waste Managements**

a)	Is identification done for various types of hazardous wastes?	YES
b)	Are these quantities less than those specified by the hazardous wastes? (Management and handling Rules-1989)	YES
c)	What are their disposal modes?	SOP's available
d)	What are the systems/ measures adopted for controlling air / water / land pollution?	Monitoring as per MPCB consent
e)	Whether the solid waste like combustibles, plastic, metals etc. segregated?	Yes

**C-20.8 OBSERVATIONS**

a)	System is available for regular monitoring of the ambient air, and other environment parameters.
b)	Consent to operate is received from MPCB and activities compiled accordingly.

**C-12 FIRE AND EXPLOSION HAZARD****C-21.1 Organizational Set-up for fire fighting**

a)	What is the total strength of the fire station and fire crew?	Fire pump & hydrant system available
b)	How many fire crews are available in each shift?	Security team act as fire-fighting team

e)	Is there fire squad identified in each shift?	Need to prepare
d)	Standing fire order is available with latest revision	No
e)	How is the communication with the fire station?	Land line, mobile
f)	Does fire safety inspections carried out?	Yes
g)	Does emergency procedure available for leakage or combustion of flammables?	Yes, OEP available
h)	What measures are available to control the fire load in the plant area?	Layout approved by PESO
i)	Whether technical knowledge and skills of the manager and staff responsible for overall fire safety of the plant is adequate?	Yes
j)	How many major and minor incidents / fires were there in the factory during the last five years? Give department / plant wise.	Nil
k)	Have all the fires / incidents been investigated and corrective actions taken? Give break-up.	Yes
l)	Resources:	
	<p>1) Adequacy of protective clothing (coat, trouser, gloves, boots and helmets);</p> <p>2) Availability of SCBA for fire-fighting operations and spare cylinders (at least 2 for each SCBA);</p> <p>3) Adequacy of hose, nozzles, ladders, lighting equipment and pumps; and</p> <p>4) Communication facility at fire station, walkie talkie sets during fire-fighting.</p>	Yes provided

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**C-21.1 OBSERVATIONS**

- a) Fire extinguishers for emergency, located at strategic positions at different section of the plant, storage areas, security office etc. the same area be easily accessible, mark properly and maintained regularly.

**C-21.1 COMMENTS**

- a) Fire hydrant is available in all plant need to be provided with fire hydrant system in the plant considering the major fire hazards as compliance to The Maharashtra Factory Rules, 1963 R-70B and provisional NOC is obtained from Directorate of Fire, Govt. of Maharashtra as per The Maharashtra Fire Prevention and Life Safety Act, 2008.

**C-21.2 Built in Safety in civil Design and Construction**

a)	Whether the two-safe means of escape available? Are they in separate directions?	Yes
b)	Is emergency exits provided to the building handling flammables?	Yes, approved by PESO
c)	Whether emergency lights are provided?	Yes
d)	Whether fire/ smoke detectors are installed in fire prone areas?	Yes
e)	Whether fire call points are provided in different areas?	Yes
f)	Whether Fire hydrants are provided near the buildings?	Yes
g)	Is ventilation system in plant handling flammables is adequate to prevent formation of flammable mixtures?	Yes
h)	Is adequate separation is provided between combustible/flammable materials and other material to restrict the fire growth?	Yes, plan approved by PESO
i)	Access routes for firefighting operations is available for areas having high fire load?	Needs to be provided

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j)	Whether building changes interferes with fire detection and / or fire suppression systems?	No
k)	Whether building changes cause unreasonable fire loading / openings in the fire rated walls?	Need to be done

**C-21.2 OBSERVATIONS**

- a) Adequate Firefighting system is available. Fire NOC No. MFS/51/2022/782 dated 25.10.2022 issued by Directorate of Maharashtra Fire Services Govt. of Maharashtra.

**C-21.2 COMMENTS**

- a) Fire smoke detector needs to be provided in fire prone area to avoid fire incident.

**C-21.3 BUILT IN SAFETY IN ELECTRIC CIRCUITS AND EQUIPMENT**

a)	Are the electrical equipment in areas where flammables mixture is likely to be present of flame-proof type?	Yes
b)	Are lightning arrestors are provided to the buildings / structures storing flammable materials?	Yes
c)	Whether adequate bonding and grounding of electrical equipment / pipelines provided?	Yes

**C-21.3 OBSERVATIONS**

- a) Adequate bonding and grounding need to be check. Glands of flameproof equipment found open in few locations.

**C-21.3 COMMENTS**

- b) Electrical fitting to be of flame proof type, adequate bonding and grounding of electrical equipment /pipelines to be provided.

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**C. 21.4 EXPLOSIVE SUBSTANCES**

a)	Whether necessary license / approval taken from concerned statutory bodies?	Yes
b)	Whether systems for explosion suppression, high speed fire detection with deluge, sprinklers, explosion venting etc. are provided?	Yes, layout approved by PESO & DISH
c)	Whether explosion resistant walls or barricades are provided around explosive storage?	Yes, Explosives Process buildings protected by VIFT, and explosives products stores/magazine are protected by NAT of earthen mounds.
d)	Whether explosive substance storage areas are restricted for entry?	Yes
e)	Whether only trained persons are handling explosive substances?	Yes, trained and competent persons as approved by PESO are deployed in explosives handling.
f)	Whether explosive substances are stored and transported in approved containers only?	Yes, in approved vans
g)	Whether electrical fixtures in areas handling explosives are explosion proof type?	Yes
h)	Whether adequate measures are taken to prevent any sources of ignition where explosive substances are handled?	Yes

**C-21.5 Fire Safety in handling Flammable and Explosive material**

a)	Whether emergency procedure is available for control of leakage?	Need to prepare
b)	Whether emergency measures are displayed locally in case of accidental spillage / leakage?	Yes

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c)	Whether facility is provided for safe drainage of combustible or flammable liquids in case of leakages?	No flammable liquids storage. Acid storage area is protected by dyke wall and it is connected to ETP
d)	Whether highly flammable liquids are stored under inert atmosphere?	NA
e)	Whether flammable storage tanks are provided with flame arrestors?	Yes
f)	Whether suitable PPEs are provided?	Yes

**C-21.5 OBSERVATIONS**

C-21.5	Electrical fitting is not flame proof type, adequate bonding and grounding of electrical equipment /pipelines to be provided.
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**C-21.6 Fire Detection and Alarm system**

a)	What type of fire detection and alarm system provided?	Yes, fire detection and alarm system provided in AN storage and CFB stores
b)	Whether all fire prone areas of the plant are covered with fire detection system?	No
c)	Whether fire detection equipment and smoke alarms in good operating condition?	NA
d)	Whether the number of fire call points are adequate and free from obstruction?	NA
e)	Whether regular inspection / maintenance / testing of fire detection and alarm system carried out and records maintained?	Yes, AMC is given, and testing records maintained.
f)	Whether any atmospheric monitoring is carried out for explosive mixture of gases or vapors?	No
g)	Whether emergency power supplies are provided to fire detection and fire alarm system?	NA

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h)	Whether smoke detectors are located considering ventilation pattern?	NA
j)	Whether annunciation of fire is local or in the control room or in both places?	NA
k)	Whether fire panel is constantly attended?	NA

**C-21.6 OBSERVATIONS**

a	Smoke detector found in working.
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**C-21.6 COMMENTS**

b	Smoke detector are operational, suitable type of fire alarm to be provided.
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**C-21.7 Passive and active Fire Protection System**

a)	What are the passive fire protection measures available? (barriers, door, dampers etc.)	Need to be provided.
b)	Are the areas requiring fire barriers identified?	Need to identify
c)	Whether the fire barrier provided is of adequate ratings?	Need to identify
d)	Whether ventilation ducts in flammable areas have been provided with isolation dampers of suitable fire rating?	No
e)	Whether sprinklers / deluge are installed wherever necessary?	Yes, deluge system provided in PETN, HMX, RDX and TNT process plants
f)	Whether regular inspection / maintenance / testing of the fire protection system carried out and records maintained?	No

## C-21.7 OBSERVATIONS

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a)	Fire barriers found provided and regular inspection and maintenance of fire protection system carried out and record maintained.
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## C- 21.8 Fixed Fire Extinguisher System

a)	What are the sources of fire water and whether they are dedicated to the fire extinguisher system?	Dedicated fire water storage tank is available.
b)	Whether the capacity of dedicated water reservoir is adequate to supply to hydrants for minimum 2 hours?	Yes
c)	Whether un-interrupted power supply is provided to the firewater pumps?	Yes
d)	Whether the extinguisher medium selected is appropriated to the class of fire (water, gaseous foam, dry powder)?	Yes
e)	Whether fire hydrant layout is available?	Yes
f)	Whether additional (over minimum requirement) fire hoses, nozzles are available?	Yes
g)	Whether the hydrant lines are kept pressurized?	Yes
h)	Whether regular inspection / maintenance/ testing of fixed fire extinguishing systems carried out and records maintained?	Yes, once in a year refilling done

## C-21.9 Portable Fire Extinguishing System

a)	Whether suitable type and numbers of fire extinguishers provided?	Yes
b)	Whether the fire extinguishers are located at conspicuous position and easily accessible? Are they fully charged and tagged?	Yes

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c)	Whether fire extinguishers periodically inspected, tested, refilled and records maintained?	Yes, once in year refilling done
d)	Whether defective / unchecked fire extinguishers present at site?	No
e)	Whether additional fire extinguishers are available?	Yes

#### C-21.10 Fire Fighting Equipment and Facilities

a)	Whether fire tenders (water / foam) are available?	Yes
b)	Whether the fire – fighting system and equipment approved, tested and maintained as per relevant standard?	Yes
c)	Whether the SCBA / fire suit provided to firefighting team for immediate action?	Yes
d)	What is the system for maintenance / recharge of SCBA?	Yes
e)	Is proper access available for firefighting equipment?	Yes
f)	Whether fire hose cabinets are in good condition easily visible and accessible?	Yes
g)	Whether drill tower is available? Are fire personnel carrying out regular fire drill?	No
h)	What is the communication facility at fire station? Is it adequate?	Through Mobile

#### C-21.11 Fire Drill

a)	Whether mock fire drills are conducted? What is the frequency of drills?	Yes
b)	Whether fire drills are also performed in night shift?	Not done
c)	Whether feedback of fire drill is documented?	Not done

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d)	What is the system of mutual – aid scheme?	No
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### C-21.12 Fire Fighting Training

a)	Whether there is a system of providing firefighting training to plant personnel?	Yes, regularly training conducted
b)	What is the frequency and duration of such training? Whether training records are maintained?	02 Hrs., record is available
c)	Whether fire squads are identified for different areas for first-aid firefighting and rescue, and suitably trained?	Employees are trained
d)	Are all personnel conversant with the fire prevention and protection measures?	Yes
e)	Whether the fire staff are sent for refresher / advanced training courses?	No

### C-21.13 Static Electricity and Lightning

a)	Whether all vessels and pipes are provided with suitable bonding and grounding?	Yes
b)	Whether arrangement has been made for grounding the tanker containing flammable liquid during loading / unloading?	Yes
c)	Whether spark resistant tools are provided?	Yes
d)	Whether lightning protection is provided and is adequate?	Yes
e)	Whether antistatic clothing hand gloves and footwear are provided?	Yes

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**C-21.14 Pressure Relief System**

a)	Whether the listing of all pressure plants (as defined under Factories Act) has been done?	Yes
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**C-21.14 OBSERVATIONS**

a)	Pressure relief system to be checked, firefighting training to be provided.
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**C-21.14 COMMENTS**

b)	Portable fire Extinguisher and Spark arrestor needs to be checked and record to maintained.
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**C-22 INDUSTRIAL HYGIENE / OCCUPATIONAL HEALTH**

**C-22.1.1 Ventilation**

a)	Whether any ventilation study has been carried out?	Needs to be carried out
b)	Whether natural ventilations are adequate or not?	Yes
c)	Whether dust / fumes/ hot air is generated in the process?	Yes, Boiler house, and dry fuel mix preparation area.
d)	Is there any exhaust dilution ventilation system in any section of the plant?	No
e)	Is periodic / preventive maintenance of ventilation system carried out and record is maintained?	Yes
f)	Does any ventilation system recirculate the exhausted air in work areas?	No
g)	Is the work environment assessed and monitored for chemicals and physical?	Yes
h)	Whether PPE are provided to workers exposed to dust / fumes and gases?	Dust mask provided. Suitable PPE (Nose mask) for fume are provided

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**C-22.1.2 ILLUMINATION**

a)	Whether illumination study has been carried out for the assessment of illumination level?	Lux level is checked periodically by the EHS team. Obtained values to be verified with standard values.
b)	Is there any system of periodical cleaning and replacing the light fitting/lamps in order to ensure that they give the intended illumination levels?	Yes
c)	Are the workers subject to periodic optometry tests and records maintained? Give details.	No, done for quality team and for vehicle drivers
d)	Are emergency lighting available at first aid center?	Yes

**C-22.1.12 OBSERVATIONS**

a)	Illumination level monitoring is done on regular basis. Illumination study needs to be conducted.
b)	Obtained results need to compare with IS standards or with The Maharashtra Factory Rule-35 of TMFR, 1963 rules.

**C-22.1.12 COMMENTS**

a)	Light fittings need to be maintained to ensure proper illumination at site. Cleaning shall be done for light fittings.
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**C-22.1.3 NOISE**

a)	Whether any noise study conducted?	Yes
b)	Are there any machines / processes generating high-noise?	Boiler area, D. G. Set, Testing site
c)	Whether engineering and administrative controls been implemented to reduce noise exposure bellow the permissible limits?	Yes, canopy provided to DG Set. Insertion loss is monitored periodically by NABL approved laboratory.
d)	Is there a system of subjecting all those employees to periodic audiometric test who work in high level noise areas?	Annual health check done for workers working in high noise area

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e)	Whether the workers are made aware of the ill-effects of high noise?	Yes, record to be maintained
f)	Whether ear muff / plugs are provided and used?	Need to be provided

**C-22.1.3 OBSERVATIONS**

a	Regular checking of work place noise done.
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**C-22.1.3 COMMENTS**

a)	Worker's needs to be insisted to use ear plugs, mask, goggle, apron, safety shoes as per IS standard on regular basis.
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**C-22.1.4 VIBRATION**

a)	Are there equipment which contribute excess level of vibration and whether they are identified?	Vibration check in electrical motors and compressors is done. Analysis can be done for system improvement if required
b)	Whether any vibration study has been carried out?	Yes
c)	Are the measures taken to combat vibration to acceptable levels?	Yes, rubber dampers are provided
d)	What is the frequency for measurements of vibration?	Need to set, at present as and when required study conducted
e)	Are the records of measurements and maintenance of equipment/ system maintained?	No

**C-22.1.5 HEAT STRESS / COLD STRESS (EXTREMES OF TEMPERATURE)**

a)	Are there sources from equipment increasing the heat load in work places?	NA
b)	Whether evaluation of heat stress is carried out?	NA
c)	Whether natural ventilation is adequate to minimize the heat stress in work environment?	NA

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d)	Are resources available to deal with very hot or very cold conditions (drinking water, lined gloves, insulated boots)?	NA
e)	Do workers know the symptoms of heat cramps/heatstroke or frost bite/hypothermia?	NA
f)	Are the personal protective equipment suitable for reducing the effects of heat stress available?	NA

#### C-22.1.6 NON-IONIZING RADIATIONS

a)	Does the work involve likely exposure to non-ionizing radiation (ultraviolet, infrared, radiofrequency, microwave, lasers etc.)	NA
b)	Whether risk assessment have been done for all work areas involving presence of non-ionising radiation?	NA
c)	Are the work areas displayed with relevant safety signs?	NA
d)	Are the employees aware about the hazards of non-ionizing radiations?	NA
e)	Does written procedures exists for working in non-ionising radiations?	NA
f)	Is the work environment monitored periodically for physical hazards and control measures initiated whether deviation from permissible values is observed?	Yes.
g)	Whether suitable personal protective equipment are provided to workers exposed to non-ionizing radiation?	NA

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## C-22.2 WORK PLACE MONITORING FOR HAZARDOUS CHEMICALS

a)	Whether the dust, fumes, smoke aerosols and mist are monitored as per statute and records maintained?	VOC monitoring done. Coal dust can be monitored
b)	What are the types of detectors used for monitoring concentration of hazardous chemicals?	NOx monitoring done
c)	Is any alarm system installed for any leakage of hazardous chemicals?	No
d)	Are antidotes available for toxics chemicals?	NA
e)	Are control measures initiated whenever deviation from permissible values is observed?	NA

## C-22.3 FIRST AID FACILITIES AND OCCUPATIONAL HEALTH CENTRE (OHC)

a)	Are adequate numbers of first aid boxes provided? Give location details?	First aid box provided in all departments.
b)	Are qualified / trained first aider available in each shift?	Internal training done, needs to get certified by external authorities
c)	How many qualified / trained first aiders are available at each plant / department?	Training to be done
d)	How many persons are trained / given refreshers training in first aid in a year?	Needs to be provided
e)	Whether occupational health centre is provided?	Available but not as per R-73W
f)	Does OHC conform to the provisions of the existing statues?	No
g)	Are the medical attendance / Doctors available in each shift?	Not available
h)	What facilities are available for transportation of the injured to hospital?	Company vehicle

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j)	Are the names of the trained first aiders displayed?	Need to display
k)	Are the names of nearest hospitals and its telephone number available in OHC?	Yes, available at main gate, to be provided at OHC.
m)	Does the plant have any special preventive medicine program?	No
n)	Is ambulance posted in proper place and is it available whenever required?	Yes
o)	Are sufficient numbers of anti - dotes available in case of any emergency?	NA
p)	Are fire safety measures provided in first aid Centre?	No
q)	Are emergency lighting arrangement available at first aid Centre?	No

**C-22.3 OBSERVATIONS**

a	As per Sec.45 of The Factories act 1948, OHC/ambulance room is maintained.
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**C-22.3 COMMENTS**

a	Company is having OHC inside plant need to be maintained in compliance with R73W of The Maharashtra Factories rules, 1963.
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**C-22.4 PERIODIC MEDICAL EXAMINATION**

a)	Whether the periodical medical examination of employees, required under relevant statute is carried	Yes
b)	Whether it is ensured that contractor's employee are medically examined during pre-employment as well as during the course of employment?	Pre-employment medical certificate available.
c)	During the periodical medical examination of the workers are they examined as per the hazardous	Yes, by certifying surgeon

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	process in which they work? (First schedule of the Factories Act, 1948)	
d)	Are the records of all such examination maintained?	Yes Form7 available

### C-22.5 PERSONAL PROTECTIVE EQUIPMENT AND EMERGENCY EQUIPMENT

a)	Whether list of required PPEs for each hazardous activity is available?	Yes
b)	Whether feedback from workers obtained during selection of PPE?	Procedure need to start
c)	Have the workers been trained in proper use of PPE including BA sets?	NA
d)	What is the system of procurement, inspection, issue, maintenance and replacement of PPE?	Need to start
e)	Whether qualitative and quantitative fit-check for respirators is ensured prior to use?	NA
f)	what are the arrangements for safe custody and storage of PPE?	Yes, lockers are available
g)	Are the contractor's workers provided with the required PPE?	Yes
h)	Do the PPE conform to any standard?	IS standard
j)	Are sufficient eye wash fountains and safety showers available?	Yes
k)	Whether appropriate respiratory protective devices are available in accordance to the hazard potential?	SCBA available
l)	Are the staff members trained in the right use of respiratory protective devices?	Training to be given regularly

## C-22.6 OCCUPATIONAL DISEASES

a)	Whether pre-employment medical checkup data available?	Need to start for worker
b)	During the medical checkup, is any person found having occupational diseases mentioned in 3 <sup>rd</sup> schedule of The Factories about the occurrence of the occupational disease?	NA
c)	Whether the medical practitioner informed the chief inspector of factories about the occurrence of the occupational disease?	NA

## C-23 ACCIDENT/INCIDENT REPORTING, INVESTIGATION AND ANALYSIS

## C-23.1 ACCIDENT REPORTING AND DATABASE MANAGEMENT

a)	What is the procedure for accident/incident/dangerous occurrence reporting?	SOP available
b)	Whether the accident data for the last five years for reportable and non-reportable accidents are available?	Yes

## C-23.2 ACCIDENT INVESTIGATION

a)	Are all the accidents investigated?	SOP need to prepare
b)	Whether accident investigation procedure is documented?	Yes
c)	Whether accident investigation reports are submitted to top management?	Yes
d)	How are the findings from accident investigation reports communicated to workers?	Yes

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**C-23.3 ANALYSIS OF ACCIDENTS**

a)	Whether accidents analysis is done as per IS 3786?	Analysis needs to be done as per IS 3786
b)	Whether root cause of accidents is analyzed?	Yes
c)	Is the accident statics effectively utilized? If yes, how?	Partially done
d)	What nature of injuries occurred during the last five years?	Burn, cut, explosion.

**C-23.4 IMPLEMENTATION OF RECOMMENDATIONS**

a)	How does the management ensure implementation of the recommendations to avoid recurrence of accidents and incidents?	Through MOC SOP
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**C-23.5 REPORTING AND INVESTIGATION OF NEAR – MISS INCIDENTS**

a)	Are all near-miss incidents reported and investigated?	Yes
b)	Is there any system of classifying and analyzing the near-miss incidents?	Yes

**C-24 EMERGENCY PREPAREDNESS****C-24.1 SITE SPECIFIC DETAILS**

a)	Are the site area maps (including layout, access roads and assembly points) available in control room/emergency control center?	Yes, displayed at ECC
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**C-24.2 DUTIES AND RESPONSIVITIES OF KEY PERSONNEL**

a)	Is the hierarchy emergency response personnel right from site emergency controller downward, and alternative officials identified?	Yes
b)	Are the duties and responsibilities assigned to the designated officials during emergency, both during	Yes

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and outside normal working hours clearly identified  
and understood by them?

### C-24.3 IDENTIFIED OF EMERGENCY AND ACCIDENT SCENARIO

a)	Are the possible accident scenario leading to emergency identified and known to the operating personnel?	Yes
b)	Are approved emergency preparedness plans (on - site and off-site) in place?	Yes

### C-24.4 DECLARATION AND TERMINATION OF EMERGENCY

a)	Is the list of designated officials who are to be communicated about declaration and termination of emergency available in the control room/ emergency control Centre?	Yes
b)	Are the methods of communication (siren, public address system etc.) for declaration and termination of an emergency known to all the workers?	Yes

### C-24.5 RESOURCES-EVACUATION/TRANSPORT

a)	Are the following resources (equipment, personnel and procedures) required to handle emergency available?	Yes
1)	Communication	Through Mobile
2)	Public announcement systems *	NA
3)	Monitoring of hazardous release into the environment,	Quarterly Monitoring conducted by MoEF approved laboratory. Online NOx monitor and Handheld VOC monitor available. Also, CAAQS monitoring stations available
4)	Emergency shelters at the facility	NA

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5)	Emergency exits with proper illumination, with uninterrupted power supply.	Yes
6)	Direction for emergency exit / escape route marked in haulage / Alleyways.	Approved by PESO & DISH
7)	Transport for evacuation of plant personnel.	Yes
8)	Medical care including administration of antidotes and	Available
9)	Security / maintenance of law and other	Yes

**C-24.6 COMMUNICATION FACILITIES**

a)	Does the emergency control center have direct communication links with the fire station and the plant control room?	Yes
b)	Are there adequate alarm points from which an emergency alarm can be raised?	Yes
c)	Is there infrastructure available for ensuring back up electrical power supply for communication links where required	Yes

**MEDICAL CARE**

a)	Is the procedure for emergency medical care available?	Yes
b)	Whether the system has been tested at regular frequency through mock drill / exercises for its adequacy?	Yes
c)	Does the system of periodic replacement of antidotes and medicines require in emergency exit?	Yes

**C-24.8 UPDATION OF EMERGENCY PLAN**

a)	Is the emergency plan updated based on the feedback from the periodic drills/ exercise?	Yes, Last Emergency Plan updated on 30.09.2023 in accordance to CIMAH Rules, 2003.
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b)	Are the contract details of all concerned official kept updated in the emergency plan?	Yes,
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**C-24.9 PERIODIC DRILLS/ EXERCISE**

a)	Are mock-exercise conducted at stipulated intervals?	Yes
b)	Are the scenarios varied in the mock-exercise to ensure that all possible factors including meteorological conditions, affected plant personnel covered?	Yes
c)	Whether emergency preparedness plans have been tested and reviewed at regular frequency through mock drill for its adequacy?	Yes

**C-24.10 TRAINING OF PLANT PERSONNEL**

a)	Are public awareness programs conducted for the people around the site regarding the action to be taken in case of off - emergency	Awareness comes needs to be conducted
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**C-24.12 MUTUAL-AID PROGRAMME**

a)	Is the type of accidents where external organizations would be involved in remedial actions identified? Are their responsibilities defined?	No
b)	Is the plant responsible for rendering mutual aid assistance to any other external organizations?  Does this assistance effect the plants emergency preparedness?	Yes  No
c)	Whether the communication channels for mutual assistance identified and known with and between two organizations?	Yes

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**C-24.13 EMERGENCY CONTROL CENTRE**

a)	Is the emergency control center located beyond the effective distance of identified emergency scenarios?	Yes near Security room
b)	If the emergency control center is located within the effect distance, is it suitably protected that it will be available in case of emergency?	Away from plant process area

**C-25 SAFETY INSPECTION****C-25.1 INSPECTION PROGRAMME**

1.	Are checklist available for inspection? For example, availability of checklists like:	Yes, through Gensuit safety management Software
a)	Handling, storage and transportation of hazardous chemicals:	Yes
b)	Electrical hazards	Yes
c)	Fire safety	Yes
d)	Hand and portable power tools	Yes
e)	Machine hazards	Yes
f)	Lifting equipment	Yes
g)	Ladders and scaffolding	NA
h)	Environmental Monitoring	Yes
j)	Civil structure	Yes
k)	House keeping	Yes
m)	Emergency equipment and	Yes
n)	Gas cylinder and other pressure vessels used/available in the organization.	Yes

**C-25.2 SAFETY RELATED DEFICIENCY (SRD) REPORT**

a)	Are SRDs generated based on the area wise checklists?	Yes through GEN
b)	What is the procedure for resolving the SRD?	Yes
c)	Whether the procedure exists for notification and root cause analysis of non-conformities and action taken on them?	Yes

**C-25.3 SAFETY INSPECTION RECORDS**

a)	Are the safety inspection records maintained?	Yes, soft
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**C-25.4 METHODOLOGY AND INSPECTION TEAM**

a)	Is there written procedure for safety inspection?	Yes
b)	Whether safety inspection is carried out by a designated team?	By safety & production
c)	What is the frequency of safety inspections?	Monthly
d)	Whether an inspection report is generated?	Yes online

**C-25.5 COMPLIANCE OF RECOMMENDATIONS**

a)	To whom the recommendation are submitted?	Plant Head
b)	Are recommendation of safety inspections complied in time?	Yes
c)	Is compliance of recommendation sent to top management?	Yes
d)	Is compliance of recommendations reviewed by safety committee?	Yes
e)	Does top management follows-up the compliance?	Yes

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**SECTION 9: STATUTORY APPROVALS**

Checked all Legal Documents there is regular follow up on the statutory compliance and well – maintained record. Over all there is commitment of management towards compliance to the statutory requirements is seen. The follow up system is satisfactory. Procedure for updating legal and statutory compliances is evident. Detailed Legal register is prepared along with summery of list of licenses.

Sr. No.	Particulars	Details
1	Name of Occupier	Mr. Milind Deshmukh
2	Name of Factory Manager	Mr. Purushottam Pundalik Deotare
3	Name of Safety Officer (If Applicable)	Mr. Hemant Tepale Mr. Sujay Kumar Mr. Dhiraj Rajgure Mr. Pawan Hiwse Mr. Shubham Ghuse
4	Name of Company Doctor (If Applicable)	Dr. Ashok Kasatwar , MBBS, AFIH
5	Name of Welfare Officer (If Applicable)	Mr. B.B. Singh
6	Form 27 annual return	Jan. 2024
7	Factory License Number	10492 valid till 31.12.2026
9	Last plan approval from DISH	12050000025343 dated: 06/08/2021
10	Stability from Structural Engineer	71-2017-2595-601, Date. 26/12/2023
11	Medical Health check	Dr. Varsha Potdar on dated: 16-18 Aug'2023
12	Pressure vessel & Lifting equipment's Testing Date & by Whom	27.11.2023 To 29.11.2023 By M.D. Safety Consultants Pvt. Ltd.
13	MPCB License	Formate : 1.0 CAC/UAN No. 0000119394/CR - 2201001112 dated 25.01.2022 valid up 30.06.2026
15	Registration of Contractor	165-2300710007921 dated 03.02.1998
16	PESO License	List enclosed
17	Weights & Measures	Testing Conducted on 15.03.2023
18	Fire Insurance	NA
19	Fire NOC	Fire NOC No. MFS/51/2022/782 Dt. 25.10.2022
20	BCC date from MIDC	NA
21	Latest Electrical Engineer Approval	SE/NRC/T/HT/179 Dated 15.01.2024
22	Lift License (If Applicable)	NA
23	Sexual Harassment Committee Date of Declaration	Available
24	Gas Cylinder Storage License (If Applicable)	NA
25	D G Set Approval from Electrical dept.	0E150500110520220006922 Dt. 19.05.2022

**SECTION 10: RECOMMENDATIONS**

The desired end result of a safety audit is the identification of primarily unrecognized hazards in the light of experience and early recognition of shortcomings in the areas such as the maintenance and testing of critical equipment.

The recommendations are to two types:

1. Improvement in the system's specified requirements and
2. More effective implementation of the specified.

**Observations / Suggestions:****Legal & General:**

- a. Site Notification to be Submitted to DISH authority as per CIMAH Rule 2003
- b. OHC is available in the plant, needs to be maintained as per rule 73-W of the Maharashtra Factories Rules 1963.
- c. Safety policy found signed by occupier as per section 7A & of TFA, 1948 & are 73L of PMFR 1963
- d. All new buildings, sheds to be approved from regulatory authorities.

**Building No – ANS – 1 Ammonium Nitrate ANS (Solid) Stores: Capacity – 5000 MT**

1. Suitable railing with toe guard to be provided unloading platform
2. SOP for loading and unloading of AN to be prepared in local language and shall be displayed,
3. Cracks on the wall of the building to be repaired.
4. While replacement of white FRP sheets or turbo ventilator replacement provision of rule 73F to be adhered for working at height.
5. SOP for lifting of jumbo bags to be prepared and hooks of jumbo bags to be checked before Lifting.
6. Acid proof flooring to be provided. Floor in warehouse found damaged.
7. Workplace monitoring for ammonia fumes to be done on regular interval and ensure it shall be below TLV records to be maintain.
8. Effective measures to be taken to remove ammonia fumes / provision of exhaust system to be done.
9. Housekeeping to be improved in raw material storage area.
10. Muddy portion to be clean regularly
11. All practicable measures to be taken to prevent wet floor in store to prevent accidental fall of the person.

**Accessories – 4 Store**

1. Safe stacking height of the material to be maintained as per marking

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2. Emergency exists to be kept free from obstruction and accessible.
3. All aisles, walkways to be kept free from obstruction.
4. Fire alarm is not working in this area.
5. TMT bars are coming outside of the staircase to be repaired / removed

**Building No – SN 03: Shock tube Cutting and Coiling Man.Limit – 38+2 Capacity – 20Kg**  
**License No – E/HQ/MH/20/52(E3206)**

1. Emergency exit to be kept open and accessible
2. Cut shock tubes to be kept in antistatic containers.
3. Paddle guard to be provided to end sealing machine.
4. All the provisions of the schedule VIII A for the power press shall be strictly complied with.

#### **Electrical PCC room**

1. Cracks found developed in panel room.

#### **Fabrication workshop**

1. Cracks in wall in carpentry section to be removed.
2. Gas cylinder to be stored as per gas cylinder rules.
3. Earthing to be provided to all portable electrical equipments
4. SOP to be prepared in local language for cleaning and burning of solid and hollow parts and shall be displayed.
5. Loose electrical wiring in workshop to be avoided
6. Ordinary three pin sockets shall not be used and industrial sockets to be used.
7. All Safety measures to be taken to prevent contact of human body part while cutting wooden material.
8. Junction boxes are found open ensure all the JB to be closed.

#### **Shell plant**

1. Life expectancy of grinding wheel to be checked and maximum peripheral speed of bench grinder and grinder wheel to be matched.

#### **Accessory shed – 1 and 2 (Corrugated Boxes Stores)**

1. Maximum safe stacking height to be marked and material to be stacked as per that norms only.
2. Smoke detectors and sprinklers to be provided in shed,
3. All aisles, walkways to be kept free from obstruction.

4. SOP for loading and unloading of material to be prepared in local language and shall be displayed.
5. Residence family quarters inside factory premises to be shifted outside boundary wall.

#### **Sodium Nitrate (SN) Plant**

1. Dyke pit to be design considering maximum storage capacity of WNA tank.
2. SOP to be prepared for unloading of WNA from tankers
3. Cautionary notice to be displayed for use of PPE
4. SOP for feeding of Soda ash in to feeder needs to be prepared & displayed
5. Top lid of starrier / mixer to be provided with suitable interlocking arrangement,
6. All provisions of rule 57 of agitator and mixer to be strictly complied with.
7. Vertical moving shaft of starrier to be securely guarded
8. All parts of the reactor and its associated pipelines, glands, gaskets etc. to be regularly checked and records to be maintained.

#### **COB plant**

1. Dyke wall to be provided to the OB storage tank

#### **FO Storage tank**

1. SOP for unloading of FO to be prepared in local language & displayed

#### **AN concentration plant , vacuum distillation plant closed.**

#### **BMD Loading plant: (Bulk Matrix Delivery) Van:**

1. DRP dry run to be checked regularly
2. Rupture disk to be checked regularly before start of operation

#### **AN melt storage tank**

1. Dyke to be design considering maximum storage capacity.

#### **Thermo pack boiler**

1. All provision of thermic fluid heater to be strictly complied with. Thermic fluid to be got tested regularly.
2. Startup and shutdown procedure to be prepared in local language and shall be displayed.
3. Color coding of pipe lines to be done as per IS code

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**SMO / PIBSA**

1. All parts of reactors lids, glands, gaskets, nut bolts, pipelines to be regularly checked
2. Interlocks for pressure, temperature, level to be checked regularly and records to be maintained
3. Maintain nitrogen level
4. Adequate railing with toe guard to be provided to working platform
5. Expansion tank of thermic fluid to be installed outside
6. SMO sludge to be removed time to time and general housekeeping to be improved
7. SOP for heating diethyl amine to be prepared in local language and shall be displayed
8. All pipelines connected to various reactor vessels to be properly colored as per IS code their attachment such as gland, gaskets, valves, flanges, flange joints to be checked regularly.

**ETP**

1. SOP for removal of sludge from ETP to be prepared in local language and shall be displayed
2. Secondary containment to be provided to all containers containing liquid chemicals.
3. Adequate toe guard to be provided to washer platform.

**Aluminum flake**

1. Earthing to be checked regularly.
2. Flame proof DB to be provide
3. At present single earthing is provided to, ensure double earthing.

**Wire coating plant**

1. All moving, rotating parts and pullies, shafts of extrusion machine to be securely fenced
2. Rotating pullies of wire winding machine to be securely guarded.
3. Adequate guard to be provided to harness wire spool machine
4. Moving belt drive of motor to be securely fenced.

**HMX plant is under preventive maintenance**

**Process – HMX RDX Crystallization Explosive Limit 1500 Kg Man limit – 3+2**

**License no E/HQ/MH/20/95 (E113511)**

1. Operating switches of the crystallizaors to be made accessible to all during working hours
2. All practicable measures to be taken to prevent tilting of nutsche filter
3. Exhaust fan is removed form the location as it is not in working condition, install new flame proof exhaust fan

4. Solvent BLO drums is to be stored under shed
5. Dry vegetation to be clean immediately.

**Process – Granulation Building GB – HMX – RDX**

1. SOP for granulation and milling operation to be prepared in local language and shall be displayed
2. To ensure floor to be in wet condition, at the time of audit it was not wet.
3. Operating switches and interlocks to be checked regularly for its smooth operation and records to be maintained

**Building No PP-19 Process- RDX manufacturing. License – E/HQ/MH/20/95/(E113511)**

Man Limit – 3 + 2

1. Plant is not in working condition during the audit.
2. Concentration of ammonia fumes to be reduced by adopting suitable measures such as water spray ‘
3. Cables of flame proof lights to be totally fixed in Glands.
4. Vacuum pump leakage to be prevented. Material (acetic acid) found leaked, all practicable measures to be taken to prevent leakage.
5. Workplace monitoring to be carried out for ammonia fumes.

**PP – 25 New upcoming plant**

1. Plans of PP-25 and machine layout to be got approved from DISH

**Building No HD – 5 Process – HMX/RDX and compound product drying**

License no – E/HQ/MH/20/95/(E113511) Explosive limit – 1000 Kg Man Limit – 2+1

1. Flame proof lights to be provided, ordinary lights are installed outside the building.
2. Solenoid valves to be checked regularly for its functioning and records to be maintained
3. Vegetation grass in the periphery of the building to be cleaned.

**Building No PB – 1 Process – HMX/RDX compounded product packing**

License no – E/HQ/MH/20/99/(E113448) Explosive limit – 1000 Kg Man Limit – 5+1

1. Seat with back rest to be provided to the workers working in inspection area.
2. Humidity to be maintained in the area.
3. Surface to be made wet all the time.
4. Gland packing of flame proof lights enclosure is found loosen ensure it must be tight.

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5. MEG and MEK drums are found kept in open to sky, it shall be kept inside the shed.

**R & D Laboratory:**

1. H2 detector in gas chromatography area to be made operational.
2. Ensure Emergency exits to be kept open and shall be used at the time of emergency
3. All practicable measures to be taken to prevent H2 leakage.
4. All electrical fittings in H2 area shall be of approved flameproof type.
5. Empty cylinders to be chained properly to avoid fall
6. Hydrogen cylinders shall be kept in shed.

**Plans and machinery layout:** Found displayed at the workplace

**Granulation and Crystallization Building No GB- 2**

License no – E/HQ/MH/20/95/(E113511) Explosive limit – 1000 Kg Man Limit –4+2

1. SOP for granulation and crystallization to be prepared in local language and shall be displayed at the point of use.
2. Wheels of Nutsche filter to be checked whether they are antistatic type or not, use antistatic wheels to the filter.
3. Earthing and bonding shall be checked regularly.

**HMX/RDX Compounded Product Packing Building No PB – 3 Process**

License no – E/HQ/MH/20/95/(E113511) Explosive limit – 1500 Kg Man Limit – 4+1

1. SOP for screening of RDX to be prepared in local language and shall be displayed at the point of use and employees needs to be trained accordingly.
2. Continuity of earthing at crocodile clip for table to be checked, at present it is found loose.

**LA / LS Manufacturing Plant (Building No SL-1)**

License no – E/HQ/MH/20/09/(E130024) Explosive limit – 20 Kg Man Limit – 6+2

1. Color coding of pipelines shall be as per IS code
2. Top lid of strainer and mixer shall be securely guarded.
3. CCTV camera shall be enclosed in flame proof casing.
4. Electrical control panels are not properly enclosed some gaps found in panel are closed by using plastic tapes.
5. Rubber insulating sheets in front of MCC panel in utility area to be changed.
6. Electrical cable dressing to be done properly near vacuum pump.

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**Building No SL – 2 Process – Wet LA / LS / Dry ASA store****License no – E/HQ/MH/20/09/(E130024) Explosive limit – 200 Kg Man Limit – 2+1**

1. Remove pipe tree behind building inside wall.
2. Vegetation grass on mound to be removed.

**Building No SL – 3, 4, 5 Process – ASA / APA Drying Plant****License no – E/HQ/MH/20/110/(E130073) Explosive limit – 9 Kg Man Limit – 3+1**

1. All interlocks of electrical heaters to be checked regularly for their proper functioning.
2. Steel cupboard kept inside the plant may cause spark due to friction, it is advisable to use wooden cupboard in place of steel cupboard
3. Interlocks of hot air blower to be checked regularly for its proper functioning and records to be maintained,

**ETP**

1. Top opening of ETP pits adjacent to SL – 5 to be closed.
2. All openings of underground tanks to be securely fenced
3. SOP for sludge removal to be prepared and shall be adhered
4. Top opening of neutralization tank to be covered with suitable interlocking arrangement.

**Building No SD – 3 Process – Filling Pressing and packing****License no – E/HQ/MH/20/110/(E130073) Explosive limit – 60 Kg Man Limit – 39+2**

1. Seat with backrest to be provided to workers engage in empty shell and filing inspection activity
2. Non-sparking antistatic, intrinsically safe, spark resistant tools to be used for packing the boxes of explosive filled shells.

**Building No SD – 2 Process – Filling Pressing and packing****License no – E/HQ/MH/20/52/(E32609) Explosive limit – 60 Kg Man Limit – 39+2**

1. Seat with backrest to be provided to workers engage in empty shell and filing inspection activity
2. Non-sparking antistatic, intrinsically safe, spark resistant tools to be used for packing the boxes of explosive filled shells.
3. Cracks found develop on the walls of the building

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**Building No SD – 1 Process – Filling Pressing****License no – E/HQ/MH/20/108/(E130071) Explosive limit – 99 Kg Man Limit – 25+2**

1. SOP in local language to be prepared for filling and pressing activity and shall be displayed at the point of use.

**Building No – FHSED Process – Fuse Head Soldering & Solar E Det Manufacturing House****License no – E/HQ/MH/20/110/(E130073) Explosive limit – 58 Kg Man Limit – 91+3**

1. Cracks found develop on the walls of the building to be repaired

**New Boiler:**

20 TPH boiler is under erection. Plans of the same to be got approved from DISH

**Building No – DPS Process – Dry and PETN stores.****License no – E/HQ/MH/20/109/(E130024) Explosive limit – 300 Kg Man Limit – 4+1**

1. Cracks found develop on the walls of the building to be repaired
2. Grass and vegetation found develop on the mound to be clean

**Building No – SN-1 – Shock tube manufacturing process****License no – E/HQ/MH/20// (E32609) Explosive limit – 50 Kg Man Limit – 24+2**

1. Moving pullies of composition coating unit shall be securely fenced.
2. All moving pullies of extrusion unit shall be securely fenced
3. Workers to be trained for use and care of SCBA kept in the office.
4. Checklist for checking of SCBA to be prepare and inspection to be carried out in regular

**Building No – SN – 2 Process – Mixing building****License no – E/HQ/MH/20/52/(E32609) Explosive limit – 125 Kg Man Limit – 2+1**

1. Maintain humidity in the building as per norms

**Process – Detonating Fuse Manufacturing****License no – E/HQ/MH/20/96/(E113464) Explosive limit – 800 Kg Man Limit – 14+2**

1. V Belt drive, moving pullies, moving gears of winding unit to be securely fenced
2. Rotating spool of Pay off unit shall be securely fenced
3. Rotating pullies of extruder to be securely fenced
4. Moving pullies of crushed coated fuse unit shall be securely fenced

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**Building No – PP – 16 Process – Small Dia Emulsion Manufacturing plant****License no – E/HQ/MH/20/7/(E13748) Explosive limit – 1000 Kg Man Limit – 13+2**

1. All interlocks of machine in the EM section to be checked regularly and records to be maintained
2. Intake nip between moving roller and moving conveyor of material carrying conveyor to be securely fenced
3. Toe guard to be provided across blender machine platform.

**Building No – PP – 11 Process – Continuous Slurry Manufacturing****License no – E/HQ/MH/20/7/(E13748) Explosive limit – 1000 Kg Man Limit – 20+2**

1. Intake nip of rotating pulleys and belt of conveyor to be securely fenced.

**DFM – 2 Dry fuel mix preparation area.**

1. Effective measures to be taken to prevent dust nuisance
2. Effective measures to be taken to prevent dust explosion.
3. SOP for all activities to be prepared in local language and shall be displayed
4. Insist use of suitable dust mask to the worker working in this area
5. Working floor and staircase to be kept free from dust.
6. Toe guard to be provided to working platform.
7. O<sub>2</sub> level to be maintained as per norms while dry fuel blending.

**TNT Plant: Building No. PP-18 (Explosives limit 1250 Kg)**

1. Flow Interlocks to be checked regularly for ONT, CAN, WNA and olium
2. All the recommendation in HAZOP to be followed regularly
3. Temperature interlocks to be checked regularly and records to be maintained
4. Agitator impeller failure to be avoided
5. Motor RPM to be checked regularly
6. Workplace monitoring to be carried out for acid fumes into tank farm area.
7. All interlocks to be checked regularly and records to be maintained.

**Building No – PP – 14 Process – Continuous PETN manufacturing.****License no – E/HQ/MH/20/99/(E113426) Explosive limit – 1000 Kg Man Limit – 4+2**

1. All interlocks to be checked regularly and records to be maintained
2. Acetone vapors to be monitored regularly and calibration of acetone sensor to be done in

regular interval

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3. Temperature interlocks to be checked regularly and records to be maintained.

**Building No – PP – 06 Process – HMX / RDX compound.**

**License no – E/HQ/MH/20/98/(E113453) Explosive limit – 300 Kg Man Limit – 7+2**

1. Electrical panels in control room to be closed during all working hours
2. Filter cloth kept behind panel to be shifted immediately
3. Staircase is blocked by aqueous solvent drums, ensure all the walk ways and staircases shall be free from obstruction
4. Aqueous carrying pipeline to be installed properly
5. Pneumate line is lying on the ground shall be properly routed & clamped
6. Tank farm area behind utility plant is not in use as reported.
7. Life line for tanker inspection shall be installed

**Ammonium Nitrate Stores (AN- 9)**

1. Hooks of jumbo bags to be checked before lifting
2. Safety stacking height shall be strictly maintained
3. SOP for lifting of jumbo bags to be prepared in local language and shall be displayed
4. Material should not be kept in exit and walkways
5. Electrical Distribution board found open.

**New Burning pit area**

1. Burning pit area is installed but not in operation because final PSEO approval is not received plan approval from DISH shall be also obtain for that area.
2. Grass and vegetation in burning pit area to be removed.

**Transportation**

1. Vehicle movement to be monitored continuously, hooter to be blown during reverse movement of vehicle to alert the person working in that area
2. Supervisor to be deputed to control traffic movement of vehicle
3. All legal, statutory documents of driver and vehicle to be checked
4. Stopper to be provided to all parked vehicles
5. Checking of Spark arresters to be introduced in vehicle checking checklist.
6. Form no 11 shall be obtain for all the hand pallets and jacks from competent person
7. Cylinders to be kept in upright position

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**Dispatch**

1. SOP for loading of containers to be prepared in local language.
2. Stoppers to be provided to vehicles when they are in rest position or parked.

**Building No – M 28 (Magazine /Stores for Slurry & Emulsion)****License no – E/HQ/MH/21/1068/(E83676) Man Limit – 4+1**

1. Railing to be provided to railing bay
2. SOP for keeping the products to be prepared in local language
3. SOP for loading material from telescopic conveyor to be prepared in local language and displayed
4. Inching switches shall be in sound condition
5. Nip between moving conveyor and roller shall be securely fenced
6. Housekeeping near area shall be improved

**Test bed**

1. SOP for testing shall be prepared in local language and displayed.
2. Hooter to be blown before testing.

**Building No – CBH – 6 Process – Cast booster manufacturing.****License no – E/HQ/MH/20/144/(E114493) Explosive limit – 800 kg Man Limit – 16+2**

1. Workplace monitoring to be done for TNT
2. Antistatic wheels to be provided to trollies
3. Plans to be got approved for newly constructed above ground water reservoir also plans for PP 24 to be got approved from DISH

**Laboratory**

1. Chemical compatibility matrix to be prepared for stored chemicals.
2. All practicable measures to be taken to prevent the breakage of glass bottles of chemicals.

**Building No – HRCPC 1 Process – HMX / RDX/ compound casting house.****License no – E/HQ/MH/20/98/(E113453) Explosive limit 300 kg Man Limit – 8+1**

1. Process not in operation during audit.

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**Occupational Health Center (OHC)**

1. OHC dimensions to be ensured as per Maharashtra factories Rules
2. Staff and Doctors to be maintain as per Maharashtra factories Rules, R-73W.

**Canteen**

1. Hygiene to be maintain in kitchen area
2. LPG domestic gas is found used in kitchen area
3. Gas manifold bank to be prepare for the LPG in kitchen area as per IS standard
4. Sufficient space for workers near roti making area needs to be maintained.

**Boiler Shed - 12 TPH**

1. Noise level in Boiler area to be checked regularly and earplugs to be used by employees in that area
2. Moving shafts of ID fan to be securely fenced
3. All practicable measures to see that bricked used for boiler is stacked in the form of hips for preventing collapse and trapping of worker below it.
4. Pull cord to be provided to conveyor carrying fuel.
5. Intake nip between moving tail end pulley and conveyor belt shall be securely fenced '.

**Workshop**

1. Moving belt and pullies of lathe machine to be securely fenced.
2. Cutting blade of power saw to be securely fenced
3. Earthing to be provided to portable grinder

**Safety**

1. Accident analysis to be carried out as per IS 3786
2. Last Safety Committee was declared on 01/01/2022 but new safety committee is not constituted as per Rules
3. Maintain equal participation of workers in safety committee
4. Last safety committee meeting was conducted on 14/11/2023 no meeting found conducted after that, Safety committee meeting shall be conducted once in a quarter

**Electrical**

1. Calibration of electrical equipment shall be carried out from NABL lab '.
2. Training for CPR to be given to all the employees of Electrical department

3. Earthing of all the earth pits in the plant to be checked regularly and records to be maintain
4. Lighting arrestors to be checked regularly for their effective functioning.

### **CLOSING MEETING**

Closing meeting with the senior management of **Solar Industries India Ltd.** for respective departments was held off at the end of plant visit i.e. on **20.02.2024**. The observations and recommendations of the audit were discussed and agreed in the closing meeting.

### **SECTION 11: CONCLUSION**

In pursuit of continued improvement, the systems have adequate ability to achieve the desired goals. The General Duties of the "Occupier" specified at Section 7-A of the Factories Act gives different obligations of the occupier. Effective management system needs to develop to ensure safety of all workers working at site.

The systems need to develop with additional thrust on regular inspections and emergency preparedness to achieve desired goals on safety & occupational health. Over all there is commitment of management towards compliance to the statutory requirements is seen and the follow up system need to develop.

Action on the safety audit report is important. The Audit compliance follow up team should be formed. Suggestions, recommendations made in the text of this report (summarized in executive summery) to be complied. There should be regular review of the implementation of Audit recommendations by top management.

## Annexure-1

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**Storage Quantities of Hazardous Chemicals covered under The Maharashtra Factories  
(Control of Industrial Major Accidents Hazards) CIMAH Rules, 2003**

List of chemicals covered under Schedule 1 Part II.

**(a). Toxic Chemicals:**

Sr. No	Toxicity	Oral Toxicity LD50 (mg/kg)	Dermal Toxicity LD50 (mg/kg)	Inhalation Toxicity LC50 (mg/l)
1	Extremely toxic	< 5- Not applicable	<40 Not applicable	<0.5 Not applicable
2	High toxic	>50- 50 Not applicable	>40-200 Not applicable	>0.5-2.0 Not applicable
3	Toxic	>50-200	>200-100	>2-10 Not applicable
3.1	PETN	1660	Not applicable	Not applicable
3.2	HMX	1670	634	Not applicable
3.3	TNT	660	795	Not applicable

**(b) Flammable chemicals: Threshold column**

(i) Flammable gases	Not applicable
(ii) Extremely flammable liquids (Flashpoint $\leq 23^{\circ}\text{C}$ & BP $> 35^{\circ}\text{C}$ )	Not applicable
(iii) Very Highly flammable liquids (Flashpoint $\geq 23^{\circ}\text{C}$ & BP $> 35^{\circ}\text{C}$ )	Acetone -25.0 KL Isopropyl Alcohol- 6.0 KL Ethanol- 10.0 KL Methylethylketone 10.0 KL
(iv) Highly flammable liquids (Flashpoint $\leq 60^{\circ}\text{C}$ )	HSD (Diesel) - (72 KL)
(v) Flammable liquids (Flashpoint $\leq 60^{\circ}\text{C}$ & $< 35^{\circ}\text{C}$ )	Furnace Oil - (40 KL)

**(C) Explosives: Manufacturing of explosives, Pyrotechnic substances (Or a mixture of substances):**

Sl. No.	Explosive Substances	Manufacturing Capacity (Annual)	Licensed Storage Capacity
1	Slurry/ Emulsion Explosives	2,00,000 MT / Annum	520 MT
2	Bulk Emulsion	1,000 MT / Annum	30 MT
3	Detonator (Electric, Non- electric and Electronic)	125 million No /Annum	30 million nos.
4	PETN & PETN Drying	4500 MT / Annum	150.0 MT
5	Cast Booster	4500 MT / Annum <sup>e</sup>	40.0 MT
6	Detonating Fuse	225 million meter/ Annum	56.6 million meters
7	Lead Azide and APA, AA, APM Drying for Detonator Filling & Pressing	15 MT /Annum	1.267 MT
8	HMX & HMX Compounded products	300 MT / Annum	200.0 MT
9	RDX & RDX Compounded products	2900 MT / Annum	200.0 MT
10	TNT (Trinitrotoluene)	3000 MT / Annum	250.0 MT
11	Shock Tube (NONEL Tube)	450 million meter/Annum	33 million meters

## Annexure-2

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## List of Hazardous Chemicals Schedule I (PART II), SCHEDULE 2 (List of Hazardous chemicals)

## Part-I &amp; Part II:

Sr. No.	Material Description	Unit	List of Hazardous Chemicals Schedule-I (PART II)	Threshold Quantity Schedule 2 of MSIHC Rules, 1989	Threshold Quantity Schedule 3 of MSIHC Rules, 1989	Licensed Capacity	Threshold Storage capacity
1	ACETIC ACID	KG	YES	Not Specified	Not Specified	NA	125000
2	Acetic ANHYDRIDE	KG	YES	Not Specified	Not Specified	35000	150000
3	ACETONE	KG	YES	Not Specified	Not Specified	25000	250000
4	ALUMINIUM POWDER	KG	YES	Not Specified	Not Specified	NA	64000
5	AMMONIUM NITRATE MELT	MT	YES	Not Specified	350	620	620
6	AMMONIUM NITRATE PRILL	MT	YES	----	2500	24160	24160
7	AMMONIA SOLUTION 25%	MT	YES	Not Specified	500	NA	10
8	CYCLOTETRAMETHYLE NETETRAMINE (HMX)	MT	YES	.....	50	183.64	183.64
9	CYCLOTETRAMETHYLE TRINITRAMINE (RDX)	MT	YES	.....	50	177.85	177.85
10	DIETHYLAMINE	MT	YES	Not Specified	Not Specified	NA	2.5
11	ETHYL ALCOHOL	MT	YES	Not Specified	Not Specified	NA	10.0
12	FORAMLDEHYDE	MT	YES	Not Specified	Not Specified	NA	0.2
13	HEXANITROSTILBENE	KG	YES	Not Specified	Not Specified	250	3.0
14	ISOPROPYLE ALCOHOL	KG	YES	Not Specified	Not Specified	NA	6000
15	LEAD AZIDE	KG*	YES	.....	100	100	150
16	LEAD STYPHANATE	KG	YES	.....	100	100	NIL
17	MALEIC ANHYDRIDE	KG	YES	Not Specified	Not Specified	NA	8000
18	METHYLEETHYLE KETONE	KG	YES	Not Specified	Not Specified	NA	10000
19	MOLYBDENUM POWDER	KG	NA	NA	NA	NA	25
20	NITRIC ACID	KG	YES	Not Specified	Not Specified	NA	18000
21	ORTHONITRO TOLUENE	KG	YES	Not Specified	Not Specified	NA	33000
22	O Xylene	KG	YES	Not Specified	Not Specified	NA	1000

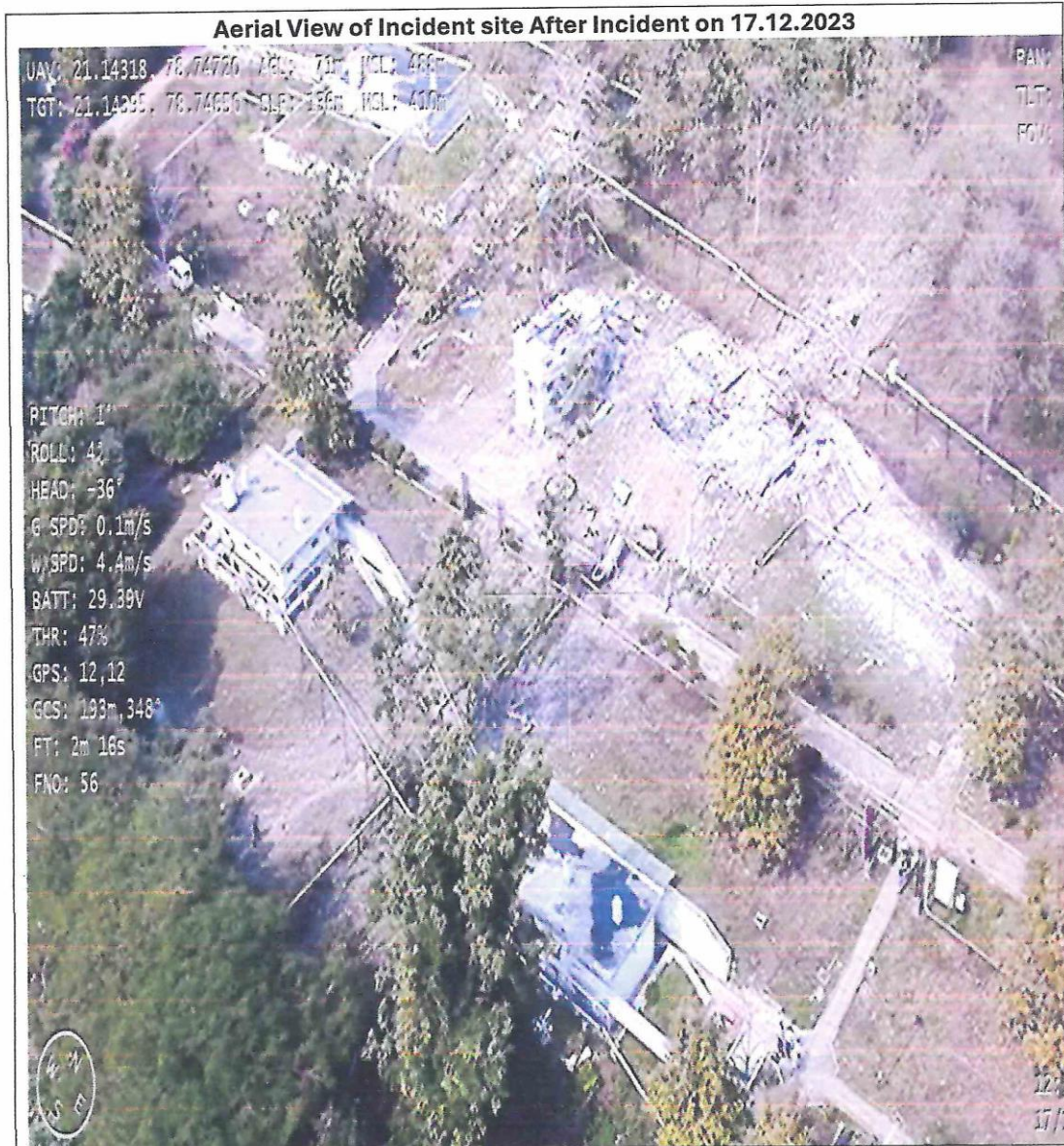
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23	Oleum	KG	YES	Not Specified	Not Specified	NA	164000
24	PARAFFIN WAX	KG	NA	NA	NA		50000
25	PENTAERYTHRITOL TETRANITRATE (PETN)	MT	YES	NA	50	135	117
26	SODIUM HYDROXIDE	KG	YES	Not Specified	Not Specified	NA	10000
27	SODIUM SULPHIDE	KG	YES	Not Specified	Not Specified	NA	10000
28	STYPHANIC ACID	KG	YES	Not Specified	50	150	150
29	SULPHURIC ACID	KG	YES	Not Specified	Not Specified	NA	100
30	TRINITROTOLUENE (TNT)	MT	YES	.....	50	200	150
<b>Other chemical used but not listed in schedule</b>							
1	MAGANISUM OXIDE	KG	NA	NA	NA	NA	125
2	LIMESTONE	KG	NA	NA	NA	NA	100000
3	LEAD STEARATE	KG	NA	NA	NA	NA	25
4	LEAD STEARATE	KG	NA	NA	NA	NA	25
5	LEAD NITRATE	KG	NA	NA	NA	NA	2500
6	SODIAM CHLORIDE	KG	NA	NA	NA	NA	21000
7	HIGUM	KG	NA	NA	NA	NA	48000
8	HEXAMINE	KG	NA	NA	NA	NA	32000
9	HEAVY OIL	KG	NA	NA	NA	NA	70000
10	SODIAM NITRATE	KG	NA	NA	NA	NA	40000
11	SODIUM NITRITE	KG	NA	NA	NA	NA	42000
12	PERCHLORATE	KG	NA	NA	NA	NA	178000
13	DEXTRINE	KG	NA	NA	NA	NA	500
14	SULPHUR	KG	NA	NA	NA	800	500
15	SODIUM PERCHLORATE	KG	NA	NA	NA	174	174
16	POTASSIUM CHLORATE	KG	NA	NA	NA	3	3
17	POT. PERCHLORATE	KG	NA	NA	NA	3	3
18	CALCIUM NITRATE MELT 60%	KG	NA	NA	NA		150000
19	ZINC OXIDE	KG	NA	NA	NA		5000
20	DIETHYLAMINE	KG	YES	Not Specified	Not Specified		10000
21	SORBITOL	KG	NA	NA	NA		85000
22	SOLVENT-1(GBL)	KG	NA	NA	NA		16000
23	FATTY ACID	KG	NA	NA	NA		114000
24	OLEIC ACID	KG	NA	NA	NA		1000
25	SODIUM DICHROMATE	KG	NA	NA	NA		5000
26	SODIUM CARBONATE	KG	NA	NA	NA		80000
27	POLY ISO BUTENE	KG	NA	NA	NA		120000
28	PARAFFIN OIL	LTR	NA	NA	NA		5000
29	PARAFFIN WAX	KG	NA	NA	NA		50000
30	PENTA ERYTHRITOL	KG	NA	NA	NA		80000
31	MEZZ STARCH	KG	NA	NA	NA		60000

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ANNEXURE NO. 22

Photographs



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Fig: Photo of Utility shed attached to HR-CPCH-2 Building & Removed Damage Equipment



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Earlier Photographs of HR CPCH2 Building



Photograph: Scrubber area attached to HRCPCCH-2 Building before Incident

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Photograph: South side process Building at the incident site



Photograph: South-West side process Building at the incident site



**DUSON**  
CIVIL ENGINEERING SERVICES LLP

ANNEXURE No. 23

**Form No-1 A**  
**Rule: - 3A**  
**Certificate of stability**

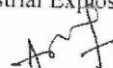
Name of Factory : Solar Industries India Ltd  
Village Town and district Which the factory is situated : Village Chakdoh, Bazargaon, Amravati Road, Tah- Katol, Dist- Nagpur  
Full postal Address of the factory : Solar Industries India Ltd Chakdoh, Bazargaon, Amravati road, Tah. Katol District Nagpur  
Name of the occupier : Mr Milind B. Deshmukh  
Name of Manufacturing : Explosives and Explosive Accessories Process to be carried on in the factory  
Numbers of floors on which workers Will be employed : Ground floor & Mezzanine floor

I certify that I have inspected the premises, the plant of which has been reviewed and examined the various parts including the foundation with special reference to the machinery plant etc that have- been installed.

Approved plans by the Chief Inspector in his letters no details as under: -(1) PLAN /82-96/3195/65 Dtd. 5.4.96 (2) Plan 195-96/129-5/55 Dtd. 6.9.96 (3) PLAN/II-DISH/VKS/PPM/260-98-99/738-55 Dtd. 23-02-1999 (4) Plan /II -DISH/VKS/PPM/257/-99/12007 (5) Plan /VKS/PPM/259/2000/2675-78 dt 13.10.2000 (6) Plan/VKSPM/NGP/22-2001/9301dt 31.10.2001 (7) ADIS /PLAN/47-2002/2589-2603 dt 2.5.2002 (8) ADIS/PLAN/89-2002/7728-35 dt 30.11.2002 (9) ADIS /PLAN /65-2004/2925/41 dt 4.6.2004 (10) PLAN/VKS/PPM/NGP/137/-14/6477-91 dt 30.10.2004 (11) PLAN/MNG/SAK/10/2009/10963-95 dt 17.12.2009 (12) PLAN/SLC/SAK/152-10/420-38 dt 24.01 2011 (13) □ □ □ □ /□ /SAK/102-2012/3992dt 13.8.2012 (14) □ □ □ □ /□ /SAK/35.2013/13714-16Dt 18.4.2013 (15) □ □ □ □ /□ //HHS/83-2014 /8161-99 dt 5.7.2014 (16) PLAN/JMM/SAK/16-15/1158-88 Dt.03/03/2015 (17)PLAN/JMM/SAK/48-16/3124-32 Dtd. 20/05/2016 (18) 120500000025343 Dtd. 06/08/2021.

And examined the various parts including the foundation with special reference to the machinery plant etc that have been installed.

I am of the opinion that all the works of engineering, construction in the Premises is/are structurally sound and that it's their stability will not be Endangered by its/their use as a factory/part of factory or manufacture of industrial Explosive for which the machinery plant etc. Installed are Intended.

Signature :   
Name : Arun D. Uttarwar  
Qualification : BE(Civil), M.Tech(Structure) (M. NO. F-125683-8)  
Chartered engineer, Fellow Member of Institution of Engineers  
Address :- 35, Deo Nagar Khamla Road, Nagpur-440015  
Date :-26.12.2023



35, Deo Nagar, Khamla Road, Nagpur-440015  
Tel.: 0712-2243353/54, +91-9823043162  
infongp@duson.co.in, arun@duson.co.in

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M/S Solar Industries India LTd

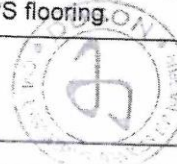
At Chakdoh ,Bazargaon ,Amravati  
Road, Tah Katol, Dist- Nagpur

List of Plant Building/Structures  
Factory Inspeitory Inspector Plan  
approval No.

S. NO.	BUILDING	SPECIFICATION
1	PP1 (SLURRY) REVISED	RCC framed structure with 230mm bricks wall with RCC roof,IPS flooring covered with R/wall earth mound
2	PP2 (SLURRY)	RCC framed structure with 230mm bricks wall with RCC roof,IPS flooring covered with R/wall earth mound
3	PP3 (SLURRY)	RCC framed structure with 230mm bricks wall with RCC roof,IPS flooring covered with R/wall earth mound
4	PP4 (EMULSION)	RCC framed structure with 230mm bricks wall with RCC roof,IPS flooring covered with R/wall earth mound
5	PP5 (EMULSION)	RCC framed structure with 230mm bricks wall with RCC roof,IPS flooring covered with R/wall earth mound
6	PP7 (EMULSION)	RCC framed structure with 230mm bricks wall with RCC roof,IPS flooring covered with R/wall earth mound
7	PP9 (EMULSION)	RCC framed structure with 230mm bricks wall with RCC roof,IPS flooring covered with R/wall earth mound
8	PP12 (EMULSION)	RCC framed structure with 230mm bricks wall with RCC roof,IPS flooring covered with R/wall earth mound
9	PP16 (EMULSION)	RCC framed structure with 230mm bricks wall with RCC roof,IPS flooring covered with R/wall earth mound
10	PP6 (HMX)	RCC framed str with 230 mm brickwall with RCC roof , IPS flooring covered with earth mound
11	PP15 (HMX)	RCC framed str with 230 mm brickwall with RCC roof , IPS flooring covered with earth mound
12	CB ( HMX- Crystallisation Building)	RCC framed structure with 230mm bricks wall with RCC roof,IPS flooring covered with R/wall earth mound
13	GB1 (HMX- Granualation Building)	RCC framed structure with 230mm bricks wall with RCC roof,IPS flooring covered with R/wall earth mound
14	HD 5 (HMX Drying Building)	RCC framed structure with 230mm bricks wall with RCC roof,IPS flooring covered with R/wall earth mound
15	PP 8 (PETN)	RCC framed str with 230 mm brickwall with RCC roof , IPS flooring covered with earth mound



16	PP10 (PETN)	RCC framed str with 230 mm brickwall with RCC roof , IPS flooring covered with earth mound
17	PP 14 (PETN)	RCC framed str with 230 mm brickwall with RCC roof , IPS flooring covered with earth mound
18	PP 18 (TNT)	RCC framed structure with 230mm bricks wall with RCC roof,IPS flooring covered with R/wall earth mound
19	PD1 (PETN DRYING)	RCC framed structure with 230mm bricks wall with RCC roof,IPS flooring covered with R/wall earth mound
20	PD2 (PETN DRYING)	RCC framed structure with 230mm bricks wall with RCC roof,IPS flooring covered with R/wall earth mound
21	PD3 (PETN DRYING)	RCC framed structure with 230mm bricks wall with RCC roof,IPS flooring covered with R/wall earth mound
22	PD4 (PETN DRYING)	RCC framed structure with 230mm bricks wall with RCC roof,IPS flooring covered with R/wall earth mound
23.	DF1	RCC framed structure with 230/350mm bricks wall /150mm RCC wall with RCC roof IPS flooring.
24	DF2	RCC framed structure with 230/350mm bricks wall /150mm RCC wall with RCC roof IPS flooring.
25	CBH 1 (HRCPCH)	RCC framed str with 230 mm brickwall with RCC roof , IPS flooring covered with earth mound
26	CBH 3	RCC framed str with 230 mm brickwall with RCC roof , IPS flooring covered with earth mound
27	CBH 4	RCC framed str with 230 mm brickwall with RCC roof , IPS flooring covered with earth mound
28	CBH 5	RCC framed str with 230 mm brickwall with RCC roof , IPS flooring covered with earth mound
29	WNS Storage Tank/CN Reactor/WNS Dosing Vessel	MS Structure with G.I. Sheet Roof Acid Proof tile flooring.
30	Pilot Plant (PP-Lab)	RCC framed Structure with RCC roof & Marble Flooring.
31	Compressor shed for PP5	MS Structure with G.I. Sheet Roof with IPS flooring.
32	Scissor Lift DFMB and Store )	RCC wall , 150 mm with MS shed
33	Scissor Lift - Magazine No. (M12,M15,M17,M18,M20,M21,M22,M23,M24,M25,M28,M29,M30,M31,M33,M34,M38)	RCC wall , 150 mm with MS shed
34	Magazine (M2,M9,M10,M11,M12,M15,M16,M17,M18,M20,M21,M22,M23,M24,M25,M28 , & M38)	RCC framed Structure with 460 mm brick wall with RCC roof,IPS flooring covered with earth mound .
35	OFB1	RCC framedstr with 230 mm brick wall with G.I. Sheet Roof IPS flooring.
36	OFB 2	RCC framedstr with 230 mm brick wall with G.I. Sheet Roof IPS flooring.
37	OFB 3	RCC framedstr with 230 mm brick wall with G.I. Sheet Roof IPS flooring.



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38	OFB 4	RCC framedstr with 230 mm brick wall with G.I. Sheet Roof IPS flooring.
39	OFB 5	RCC framedstr with 230 mm brick wall with G.I. Sheet Roof IPS flooring.
40	OFB 7	RCC framedstr with 230 mm brick wall with G.I. Sheet Roof IPS flooring.
41	OB 8	MS Structure with GI Sheet Shed & IPS Flooring
42	OB 9	MS Structure with GI Sheet Shed & IPS Flooring
43	COB PLANT	MS Structure with GI Sheet Shed & IPS Flooring
44	CFB PLANT	MS Structure with GI Sheet Shed & IPS Flooring
45	SMO PIBSA PLANT	MS Structure with GI Sheet Shed & IPS Flooring
46	SN PLANT	MS Structure with GI Sheet Shed & IPS Flooring
47	SME (BULK) PLANT	MS Structure with GI Sheet Shed & IPS Flooring
48	MELT ROOM CN MELT STORAGE	MS Structure with GI Sheet Shed & IPS Flooring
49	AN STORE 1	RCC framed str with 230mm brick wall with G.I. Sheet roof IPS flooring.
50	STORE (ACCESSORIES)	RCC framed str with 230mm brick wall with G.I. Sheet roof IPS flooring.
51	STORE (COROGATED BOXES)	RCC framed str with 230 mm brickwall with RCC roof , IPS flooring .
52	STORE (ALUMINIUM FLAKE)	RCC framed str with 230 mm brickwall with RCC roof , IPS flooring .
53	STORE (ALUMINIUM AUTOMISED)	RCC framed str with 230 mm brickwall with RCC roof , IPS flooring .
54	RM PLANT STORE COMPLEX (DOUBLE STORY)	RCC framed str with 230 mm brickwall with RCC roof , IPS flooring .
55	STORE CONSUMABLE	RCC framed str with 230 mm brickwall with RCC roof , IPS flooring .
56	STORE- PACKING MAT	RCC framed str with 230 mm brickwall with RCC roof , IPS flooring .
57	STORE- SPC	RCC framed str with 230 mm brickwall with RCC roof , IPS flooring .

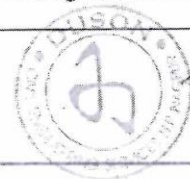


58	STORE- ACETONE	RCC framed str with 230 mm brickwall with RCC roof , IPS flooring .
59	STORE- SULPHER	RCC framed str with 230 mm brickwall with RCC roof , IPS flooring .
60	MAIN OFFICE BUILDING	RCC framed str with 230 mm brickwall with RCC roof , IPS flooring .
61	TIME OFFICE BUILDING	RCC framed str with 230 mm brickwall with RCC roof , IPS flooring .
62	SECURITY OFFICE (HIGHWAY GATE)	RCC framed str with 230 mm brickwall with RCC roof , IPS flooring .
63	SECURITY OFFICE (MAIN GATE)	RCC framed str with 230 mm brickwall with RCC roof , IPS flooring .
64	CANTEEN	RCC framed str with 230 mm brickwall with RCC roof , IPS flooring .
65	CYCLE STAND	MS STRUCTURE WITH GI SHEET SHED
66	AUTO. WORKSHOP	MS STRUCTURE WITH GI SHEET SHED
67	WATCH TOWER (1,2,3,4,5)	MS STRUCTURE WITH GI SHEET SHED
68	Effluent Treatment Plant (ETP)	RCC WALL INNER AREA FLOORING
69	Thermic Fluid Heater House (Revised)	MS STRUCTURE WITH GI SHEET SHED
70	33 KVA Pannel room	RCC framed str with 230 mm brickwall with with RCC roof ,IPS flooring.
71	DRIVERS ROOM	RCC framed str with 230 mm brickwall with RCC roof , IPS flooring .
72	GENERATOR ROOM	MS STRUCTURE WITH GI SHEET SHED
73	CHILLING UNIT ROOM	MS STRUCTURE WITH GI SHEET SHED
74	MSEB METER ROOM	RCC framed str. with 230 mm brick wall with RCC roof , IPS flooring .
75	BOILER HOUSE 1 (2 & 3 TON)	RCC framed str with 230mm brick wall with G.I. Sheet roof IPS flooring.
76	BOILER HOUSE 2 (6 TON)	RCC framed str with 230mm brick wall with G.I. Sheet roof IPS flooring.
77	BOILER HOUSE 3 (12 TON)	RCC framed str with 230mm brick wall with G.I. Sheet roof IPS flooring.
78	MAINTENANCE WORKSHOP	RCC framed str with 230mm brick wall with G.I. Sheet roof IPS flooring.
79	DRY FUEL MIXING BUILDING	MS STRUCTURE WITH GI SHEET SHED.
80	CRIMPING & PACKING HOUSE ( CPH1 )	RCC framed structure with 230/350mm bricks wall /150mm RCC wall with RCC roof IPS flooring.
81	CRIMPING & PACKING HOUSE ( CPH2 )	RCC framed structure with 230/350mm bricks wall /150mm RCC wall with RCC roof IPS flooring.
82	CRIMPING & PACKING HOUSE ( CPH3 )	RCC framed structure with 230/350mm bricks wall /150mm RCC wall with RCC roof IPS flooring.
83	CRIMPING & PACKING HOUSE ( CPH4 )	RCC framed structure with 230/350mm bricks wall /150mm RCC wall with RCC roof IPS flooring.
84	SD 1/SD2 - FILLING & PRESSING	RCC framed str with 230mm brick wall with RCC roof IPS flooring.

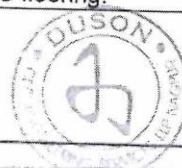


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85	SL1- LA/LS MFG	RCC framed str with 230mm brick wall with RCC roof IPS flooring.
86	SL3 ASA DRYING	RCC framed str with 230mm brick wall with RCC roof IPS flooring.
87	WIRE CUTTING & COATING	M.S. Structure with , GI Sheet Roof with IPS flooring.
88	R & D Laboratory (HMX)	RCC framed str with 230mm brick wall with RCC roof IPS flooring.
89	Transit Detonator Store-(TDS)	RCC framed str with 230 mm bricks wall with RCC roof,IPS flooring.
90	TOILET NEAR ETP	Load bearing str with 230mm brick wall with G.I. Sheet roof IPS flooring.
91	TOILET BOOSTER AREA	Load bearing str with 230mm brick wall with G.I. Sheet roof IPS flooring.
92	TOILET DCU AREA	Load bearing str with 230mm brick wall with G.I. Sheet roof IPS flooring.
93	C.N.PLANT	RCC framed str with 230mm brick wall with G.I. Sheet roof IPS flooring.
94	WEIGH BRIDGE	RCC framed str with RCC ramp.
95	HT YARD	RCC foundation chain link fencing.
96	FABRICATION SHED	MS Fabricated stru.GI Sheet Roof with IPS flooring
97	DF3	RCC framed structure with 230/350mm bricks wall /150mm RCC wall with RCC roof IPS flooring.
98	TRANING CENTER	RCC framed str with 230mm brick wall with G.I. Sheet roof IPS flooring.
99	TESTING SHED	RCC framed str with 230mm brick wall with G.I. Sheet roof IPS flooring.
100	WASTE EXPLOSIVES COLLECTION SHED	Load bearing 230mm brick wall G.I. Sheet roof
101	MAGAZINE- M29,M30,M31,M32,M33,M34,M35,M36 &M37	RCC framed Structure with 460 mm brick wall with RCC roof,IPS flooring covered with earth mound .
102	PROCESS PLANT - PP-11 (Slurry)	RCC framed structure with 230mm bricks wall with RCC roof,IPS flooring covered with R/wall earth mound
103	FOR PP-11 - OB - 6	MS Structure with GI Sheet Shed & IPS Flooring
104	DRY FUEL MIXING BUILDING - 2- DFMB - 2	RCC framed str with 230mm brick wall with G.I. Sheet roof RCC flooring.
105	GB -2 HMX / RDX	RCC framed structure with 230mm bricks wall with RCC roof,IPS flooring covered with R/wall earth mound
106	PP - 19	RCC framed structure with 230mm bricks wall with RCC roof,IPS flooring covered with R/wall earth mound
107	PACKING BUILDING -PB - 2 HMX&RDX	RCC framed structure with 230mm bricks wall with RCC roof,IPS flooring covered with R/wall earth mound
108	PACKING BUILDING -PB - 3 HMX&RDX	RCC framed structure with 230mm bricks wall with RCC roof,IPS flooring covered with R/wall earth mound



109	TRANSIT STORE -TS - 1 & 2	RCC framed str with 230mm brick wall with RCC roof IPS flooring.
110	PROCESS PLANT - 20 -PP - 20	RCC framed structure with 230mm bricks wall with RCC roof,IPS flooring covered with R/wall earth mound
111	OXIDIZER SOLUTIONS AND FUEL BLEND PREPARATION AREA-OFB - 10	RCC framed str with 230mm brick wall with G.I. Sheet roof RCC flooring.
112	PROCESS PLANT - 21-PP - 21	RCC framed structure with 230mm bricks wall with RCC roof,IPS flooring covered with R/wall earth mound
113	OXIDIZER SOLUTIONS AND FUEL BLEND PREPARATION AREA-OB - 9	RCC framed str with 230mm brick wall with G.I. Sheet roof RCC flooring.
114	CAST BOOSTER HOUSE -CBH -6 & 7	RCC framed structure with 230mm bricks wall with RCC roof,IPS flooring covered with R/wall earth mound
115	PETN DRYING - PD - 6,7 & 8	RCC framed structure with 230mm bricks wall with RCC roof,IPS flooring covered with R/wall earth mound
116	FUSE HEAD SOLDERING HOUSE & e-Dat MANUFACTURING-FHSED	RCC framed str with 230mm brick wall with RCC roof IPS flooring.
117	WET LA/LS & DRY ASA STORE-SL-2	RCC framed str with 230mm brick wall with RCC roof IPS flooring.
118	ASA DRYING PLANT - 4-SL-4	RCC framed str with 230mm brick wall with RCC roof IPS flooring.
119	ASA/APA/AA DRYING PLANT-SL-5	RCC framed str with 230mm brick wall with RCC roof IPS flooring.
120	SHOCK TUBE MANUFACTURING BUILDING-SN-1	RCC framed str with 230mm brick wall with G.I. Sheet roof RCC flooring.
121	MIXING BUILDING FOR SHOCK TUBE PLANT-SN-2	RCC framed str with 230mm brick wall with RCC roof IPS flooring.
122	SHOCK TUBE CUTTING, COILING, END SEALING & TAGGING BUILDING-SN-3	RCC framed str with 230mm brick wall with G.I. Sheet roof RCC flooring.
123	FILLING , PRESSING AND PACKING-SD-3	RCC framed str with 230mm brick wall with RCC roof IPS flooring.
124	LABORATORY-1-LAB-1 (REVISED)	RCC framed str with 230mm brick wall with RCC roof IPS flooring.
125	R&D Testing and Evaluation-Lab-2 (R&D-2)	RCC framed str with 230mm brick wall with RCC roof IPS flooring.
126	DECONTAMINATION CHAMBER -DC	M.S. Container with RCC flooring with earth mound.
127	AMMONIUM NITRATE STORE-ANS-6,7,8 & 9	RCC framed str with 230mm brick wall with G.I. Sheet roof Bitumen flooring.
128	HSD CONSUMER PUMP-HSD	RCC framed str with 230mm brick wall with G.I. Sheet roof IPS flooring.
129	SHELL PLANT-SP	RCC framed str with 230mm brick wall with G.I. Sheet roof IPS flooring.
130	WORKSHOP (HILLTOP)-WS - 1	RCC framed str with 230mm brick wall with RCC roof IPS flooring.
131	DISPATCH OFFICE-DO	RCC framed str with 230mm brick wall with RCC roof IPS flooring.
132	EFFLUENT TREATMENT LAB-ETL	RCC framed str with 230mm brick wall with G.I. Sheet roof IPS flooring.



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303

133	EFFLUENT TREATMENT PLANT - PP15 ETP AREA	Pre-Fabricated M.S. Welded Structure with G.I. Sheet roof IPS flooring.
134	WATER DISTILLATION UNIT-DIC	RCC framed str with 230mm brick wall with RCC roof IPS flooring.
135	COB SUBSTATION 33 KVA - 3-SUB-3	RCC framed str with 230mm brick wall with RCC roof IPS flooring.
136	DIESEL GENERATOR -DG	M.S. Structure with G.I. Sheet roof.
137	SULPHUR STORE-SS-1	RCC framed str with 230mm brick wall with G.I. Sheet roof IPS flooring.
138	SUBSTATION -4-SUB-4	RCC framed str with 230mm brick wall with RCC roof IPS flooring.
139	SECURITY CHECK POST-SCP	Pre-Fabricated M.S. Welded Structure.

I have personally gone through the structural drawing & inspected the structures.

It is certified that to the best of my knowledge & experience, the structures are perfectly safe & sound.



Arun D. Uttarwar  
B.E. (Civil) M. Tech. (Struct.)



Date: 26.12.2023

Place: Nagpur

## MAHARASHTRA POLLUTION CONTROL BOARD

Website : mpcb.mah.nic.in  
 E-Mail : [ronagpur@mpcb.gov.in](mailto:ronagpur@mpcb.gov.in)  
 Fax : 2560851  
 Phone : 2565308, 2560139



Regional Office,  
 5<sup>th</sup> Floor, Udyog Bhawan,  
 Civil Lines, Nagpur-440 001.

304

Regd.AD/Fax/Hand delivery.  
 No. MPCB/CD/1323/2023

Date: 17.12.2023.

To,  
 The Occupier,  
 M/s. Solar Industries India Ltd.,  
 Kh.No. 1,3,4,8,29-21,37-40,70-75,78,79,81-83,  
 85, 124, Chakdoh, Near Bazarganon,  
 Tal-Katol, Dist-Nagpur.

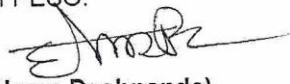
**Sub:** Closure Directions u/s 33A of the Water (Prevention & Control of Pollution) Act, 1974 and u/s 31A of the Air (Prevention & Control of Pollution) Act, 1981.

**Ref :** 1. Renewal of Consent granted by the M.P.C. Board vide Format1.0/CAC/  
 UAN No. 0000119394/CR-2201001112 dtd. 25.01.2022 Valid up to  
 30.06.2026.  
 2. Environment Clearance obtained on 07/06/2019.  
 3. News appear in E-Lokmat on 17.12.2023  
 4. Board Official visit dtd. 17.12.2023.

WHEREAS, the Maharashtra Pollution Control Board has granted you consent to operate under the provision of the Water (Prevention and Control of Pollution) Act, 1974 and Air (prevention and Control of Pollution) Act, 1981 and Hazardous and Other Wastes (Management and Transboundary) Rules, 2016 subject to certain terms and conditions more precisely prescribed in the consent order referred at No. 1.

AND WHEREAS, the News appears in E-Lokmat at 10.41 am about explosion in your factory premises and official of this office visited the site and observed that, the incidence of explosion occurred at HRCPh-2 (HMY/RDX Casting and packing house-2). During TNT (Trinitrotoulene) sieving activities & blast approx. 100 Kg of TNT materials affecting 9 nos. of peoples i.e. died in explosion.

NOW THEREFORE, in exercise of the powers conferred upon me by the Board u/s 33A of Water (Prevention and Control of Pollution) Act, 1974 and u/s 31A of Air (Prevention and Control of Pollution) Act, 1981, you are hereby directed not to restart the production activity of the affected/damaged section of your industry until you obtain permission from PESO, DISH, MPCB & other concerned departments and also directed to handle the explosive contaminated solid waste in the scientific way with the permission of PESO.

  
 (Hema Deshpande)  
 Regional Officer

**Copy submitted for information to:**

1. Hon'ble Member Secretary, M.P.C. Board, Sion, Mumbai.
2. The Asst. Secretary (Technical), M.P.C. Board, Sion, Mumbai.
3. The Joint Director (WPC), M.P.C. Board, Sion, Mumbai.
4. The Sr. Law Officer (HQ), M.P.C. Board, Sion, Mumbai.

**Copy for information and further necessary follow up to:**

Sub-Regional Officer, M.P.C. Board, Nagpur-I: It is directed to serve the copy of the directions sent on SRO's Email in person through special messenger and also to ensure the compliance of directions of closure within stipulated time and submit report thereof immediately about closure direction being complied.

ANNEXURE NO. 25

305



Safety • Quality • Reliability

Ref. SIIL/MPCB/2023-24/03

Date 30.12.2023

To,  
The Regional Officer  
Maharashtra Pollution Control Board  
5<sup>th</sup> Floor, Udyog Bhawan,  
Civil Lines,  
Nagpur (M.S.) 440 001

Sub.: Closure Directions u/s 33A of the Water (Prevention & Control of Pollution) Act, 1974 and u/s 31A of the Air (Prevention & Control of Pollution) Act, 1981 - regarding.

Ref: Your Office letter No. MPCB/CD/1323/2023 dated 17.12.2023.

Dear Sir,

We acknowledge the receipt of "Closure Directions" under reference delivered by Hand. In this regard we would like to inform you that an explosion incident had occurred at about 9:00 hrs. on 17<sup>th</sup> Dec 2023 in the HMX/RDX compounded product Pellet Casting House-2 (Building No. HRCPC-2), wherein TNT sieving operation was in progress. The incident has resulted in loss of lives of nine workers working in the plant. The Company deeply mourns this loss of life and stands with the family of the deceased in this moment of grief.

The information of the incident sent to your office vide letter no. SIIL/INCIDENT/2023-24/01 dated 17.12.2023 as well as at 13:36 hrs. over email dated 17.1.2023. Accordingly, District administration and officials of MPCB had visited the site and AAQ monitoring was conducted.

After the incident all the production process activities had been stopped immediately in the interest of public safety and "On-Site Emergency Plan" was activated.

We wish to apprise you that process building HRCPC-2 completely collapsed in the accident TNT present in the building got exploded.

The stability assessment of the surrounding buildings has been done and no damage observed. Also, no environmental damage was observed in the Water and Air, except Hazardous solid waste in the debris of the incident. Some of the explosive contaminated soil was collected from the incident site and destroyed by way of burning as per ER, 2008 and ashes will be disposed to CHWTSDF.

Since the company's manufacturing activities is governed under the Petroleum & Explosives Safety Organisation (PESO), hence, "Show Cause" and direction for suspension of that manufacturing license, as per the provision of Explosives Rules 2008 has been issued.

## Solar Industries India Limited

Regd. Office: "Solar" House, 14, Kachimet, Amravati Road, Nagpur-440033, INDIA

☎ (+91) 712 6634555/567 ☎ (+91) 712 6634578 ✉ solar@solargroup.com

CIN: L74099MH1995PLC085878 🌐 www.solargroup.com

(306)



Safety • Quality • Reliability

We do confirm that the production activity of the affected building will be stopped as per PESO & MPCB directions.

The Investigation for all the root cause and contributory causes is under progress and the corrective measures shall be implemented in due course.

Subsequent to the implementation of the corrective measures suggested, we would obtain permission from PESO, MPCB, and other concern departments.

Kindly take the above provided information for your records and consideration.

Thanking you,

Yours faithfully

For, Solar Industries India Limited

Milind B. Deshmukh  
Executive Director (Occupier)

Copy for information to:


1. Hon'ble Member Secretary, M. P. C. Board, Mumbai
2. The Asstt. Secretary, (Technical) M. P. C. Board, Mumbai
3. The Joint Director, (WPC) M. P. C. Board, Mumbai
4. The Sr. Law Officer (HQ), M. P. C. Board, Mumbai
5. The Sub Regional Officer, Maharashtra Pollution Control Board, Nagpur

## Solar Industries India Limited

Regd. Office: "Solar" House, 14, Kachimet, Amravati Road, Nagpur - 440 033, INDIA

☎ (+91) 712-6634555/567 📠 (+91) 712-6634578 ✉ solar@solargroup.com

CIN : L74909MH1995PLC085878 🌐 www.solargroup.com

Sub-Regional Office, Nagpur-I 5 <sup>th</sup> Floor, Udyog Bhawan Civil lines, Nagpur	 Maharashtra Pollution Control Board महाराष्ट्र प्रदूषण नियंत्रण बोर्ड	UAN No :	
		Rev. No :	
		Date :	
Phone : 95712 -2560139 / 52			
Fax : 95712 - 2560851			
Email : sronagpur1@mpcb.gov.in			

**VERIFICATION REPORT**

**Name of industry** :- M/s Solar Industries India Limited

**Address** :- Kh. No. 1,3,4,8,29-21, 37-40, 70-75,79, 81-83,85,124,  
Village -Chakdoh (Bazargaon), Tahsil-Katol, Dist-Nagpur,  
Pin Code 440023, State Maharashtra.

**Date of visit** :- 07/03/2024

**Visited by** :- Sub Regional Officer, Nagpur-I & Field Officer,

**Contact Person** :- Dr. S. K. Sharma (General Manager Technical)  
Mail – s.sharma@solargroup.com , Mob - 9665081945

**Purpose of visit** :- Order passed by Hon'ble NGT WESTERN ZONE BENCH,  
PUNE in Original Application No. 28/2024(WZ) Earlier Original  
Application No. 796/2023(WZ) during Hearing dtd. 19.02.2024  
Before Hon'ble Mr. Justice Dinesh Kumar Singh, Judicial  
Member Hon'ble Dr. Vijay Kulkarni, Expert Member and  
Direction vide Order Point No. 5 to the MPCB respondent No.1  
"to calculate the amount of EDC on account of damage  
caused to environment due to accident."

**Brief Description :-**

Board has granted consent vide consent No. Format 1.0/CAC/UAN/No. 0000119394/CR-220100112 dt. 25/01/2022 valid up to 30/06/2026.

Consent to operate granted for manufacturing of the following products. However during inspection the actual quantity of products manufacturing in the month of February – 2024 is as below :-

Sr. No.	Product	Maximum Quantity	Actual Quantity Feb. 24	UOM
1	Surry /Emulsion Explosives (Finished)	1,56,250	13644 MT	MT/A
2	Detonators (Finished)	125	4.84 Million Nos.	Million Nos./Year
3	Penta Erythritol Tetra Nitrate (PETN) (Intermediate & finished & finished & captive)	3000	216.4 MT	MT/A
4	Detonating Fuse (Finished)	150	11.78 Million meter	Million meter/Y
5	Pentolite /Cast Booster (Finished)	3000	205 MT	MT/A
6	Sorbitan Monooleate (SMO) (Intermediate & finished)	9162	225.7 MT	MT/A
7	Polyisobutylene Succinic Anhydride (PIBSA) (Captive & Finished)	6000	97.67 MT	MT/A
8	Calcium / Sodium Nitrate Melt (Captive )	3600	624 MT	MT/A
9	Dust Suppressant (Solar Pride) (Finished)	1000	0 MT	MT/A
10	GI/Cu Wire Coating	90	0.0 MT	Million Nos./Year
11	Filling/Pressing for Filled shells (Captive)	63	5.03 Million Nos.	Million Nos./Year
12	Land Azide (Captive)	9	0.723 MT	MT/A
13	Lead Styphanate (Captive)	3	0 MT	MT/A
14	ASA Mixing and Drying (Captive)	12	0.797 MT	MT/A
15	Cyclotetra methylene tetranitamine, (HMX) & HMX Compounded product (Captive & finished)	300	5.35 MT	MT/A
16	RDX & RDX Compounded Products	3000	6.31 MT	MT/A
17	Trinitrotoluene (TNT)	3000	83 MT	MT/A
18	Bulk Emulsion (SME)	125000	1213.2 MT	MT/A

As reported by the factory representative that the above products are manufactured for the supply to the mining activity & supply to Ordnance factories, DPSU, s DRDO and Armed Forces in India and leading exported to the Defence sector.

**Environmental Clearances:** The said unit has obtained Environmental clearance vide F. No. J11011/28/2017 IA(I), Govt. of India MoEF, New Delhi dated 07.06.2019.

The said factory has also obtained license under factories Act & Rules. Manufacturing and Storage licences from Petroleum and Explosives Safety Organization (PESO).

**The Action initiated by Regulatory Authorities & present status are as follows :**

Petroleum & Explosives Safety Organization, (PESO) had suspended TNT manufacturing licence vide letter No. E/HQ/MH/20/90(E89848) dated 20.12.2023 and licence No. E/HQ/MH/20/98(E113453) dated 20.1.2023 for manufacturing of HMX/RDX Compounded Products Casting House (HR-CPCH-2) where incident had occurred. Further "Show Cause" were issued in another manufacturing licences in view of conforming stability of the buildings and equipment. Accordingly, Stability of civil building, machinery and equipment was confirmed by chartered civil engineer. Mechanical installations, Pipelines and process safety interlock had been verified by process and safety team of the industry. An inspection of all the manufacturing building was carried out by the officers of the PESO, and their report submitted to the Chief Controller of Explosives, Nagpur, subsequently, licences above mentioned licences have been revoked on 13.02.2024 by PESO.

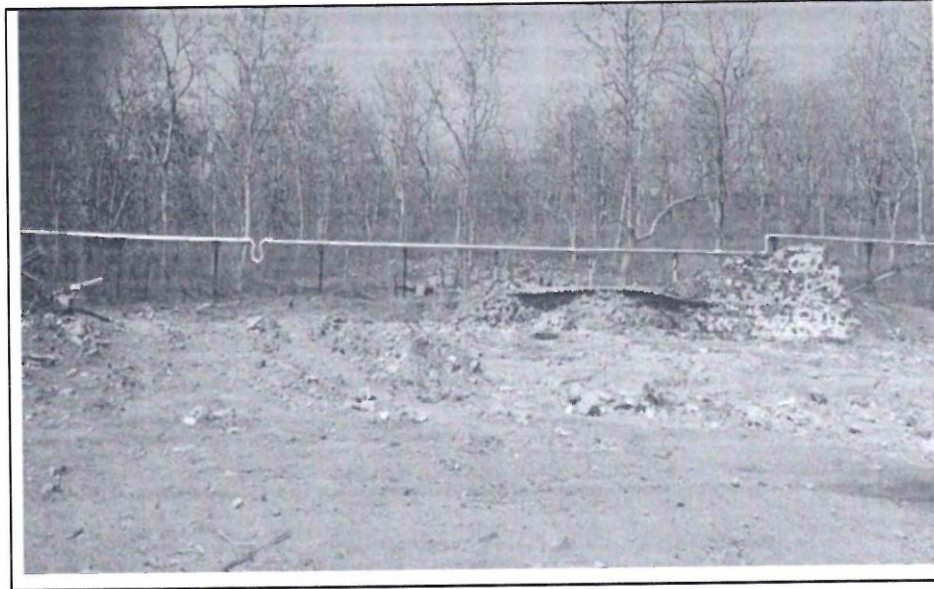
The Board has also issued "Closure Direction" vide letter No. MPCB/CD/1323/2023 dated 17.12.2023 was issued u/s 33A of the Water (Prevention & Control of Pollution) Act, 1974; and u/s 31A of the Air (Prevention & Control of Pollution) Act, 1981 and directed " not to restart the production activity of the affected/damaged section of the factory until permission from PESO, DISH, MPCB and other concern department is obtained and also directed to handle the explosives contaminated solid waste in the scientific way with permission of PESO.

Industry had submitted Reply vide letter No. SIIL/PPCB/2023-24/03 dated 31.12.2023 and further compliance submitted vide letter No. SIIL/PPCB/2023-24/04 dated 16.02.2024 and informed that suspended licences have been revoked vide PESO letter no. E/HQ/MH/20/98/E113453) and E/HQ/MH/20/90/E89848) dated 13.02.2024. However, activity of TNT sieving shall not be carried out as process building HRCPCCH-2 collapsed.

Presently during inspection of the site it is observed & verified that the damages occurred during the incident HMX/HMX Compounded products and RDX/RDX Compounded products Pallet Casting House-2 building no. HR-CPCH-2 was found collapsed & debris & damaged equipment kept beside incident site open to sky.

The contaminated solid waste – 1240 Kg was collected under the guidance of PESO and & disposed of dt. 26/02/2024 M/s. Maharashtra Enviro Power limited, Butibori, CHW-1, Nagpur. During visit Photo of incident site are as follows :

**Photo : Incident Site :-**



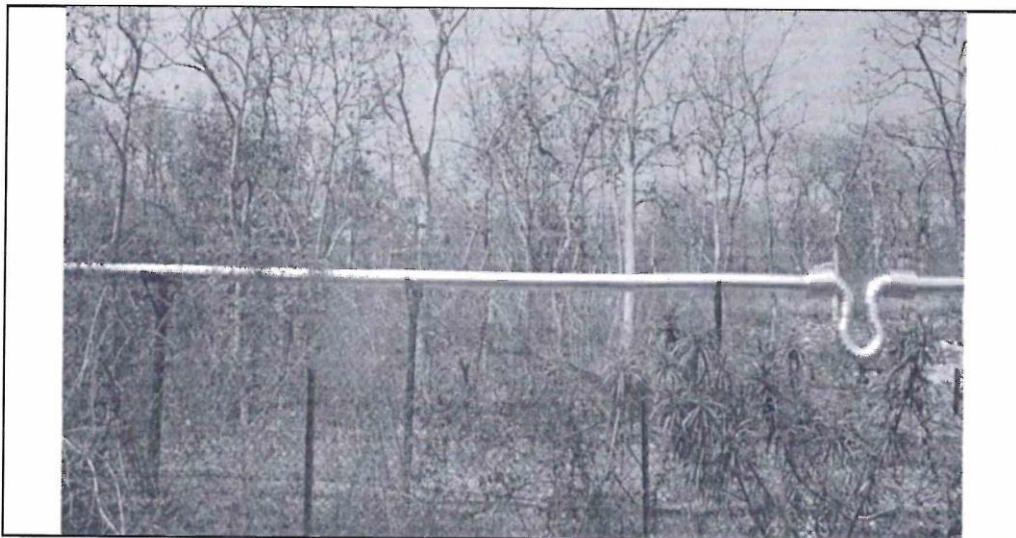
**Photo : Damaged Utility Shed at the Incident Site :-**



Photo : Debris and Equipment removed from the Incident Site :-



Photo : North side Forest Area at the Incident Site :-



During inspection & factory representative informed that due to explosion in HR-CPCH-2 building the minor damages were occurred in the surrounding building as following:

PETN/HMX/OCTOL/OKFOL/OMA Drying Building (PD-1): The 2 nos. doors were damaged and removed from the hinges and window glasses were found crack due to shock effect of the explosion. Accordingly, new doors have been replaced, wire mesh

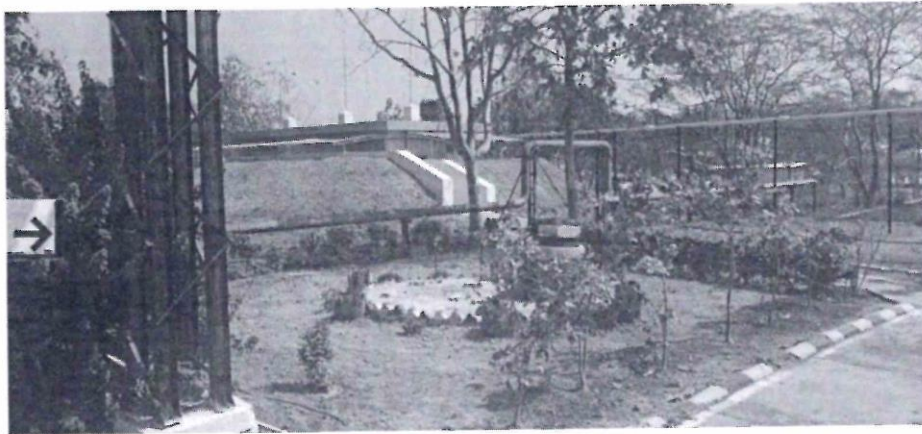
glass provided in the windows, and one cracked FRP sheet in front of building has been replaced.

**Photo : South Side of Incident Site :-**



PETN/HMX/OCTOL/OKFOL/OMA Drying Building (PD-1): The 2 nos. doors were damaged and removed from the hinges and window glasses were found crack due to shock effect of the explosion. Accordingly, new doors have been replaced, wire mesh glass provided in the windows, and one cracked FRP sheet in front of building has been replaced.

**Photo : South West of Incident Site :-**



Laboratory for Testing HMX/RDX (L): The window glasses were found crack due to shock effect of the explosion. Accordingly, new wire mesh glasses have been provided in the windows.

**Photo : Side view of Laboratory at the Southeast side of Incident Site :-**



HMX/RDX Compounded products Palette Casting House- (HR-CPCH):

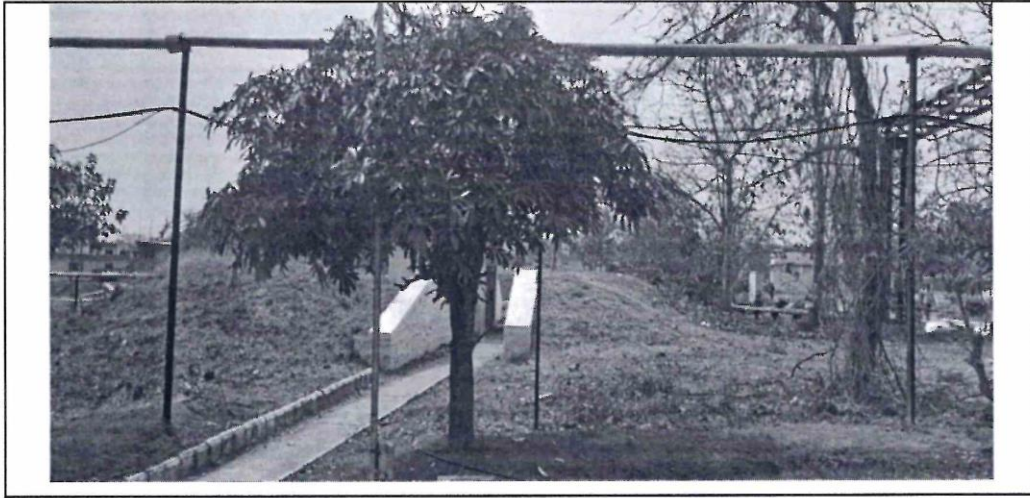
The 2 nos. doors were found damaged and removed from the hinges and window glasses were found crack due to shock effect of the explosion. Accordingly, new doors have been replaced, wire mesh glass provided in the windows, and two nos. cracked FRP sheet in front of building have been replaced.

**Photo : HRCPCH Building at the South Side of Incident Site :-**



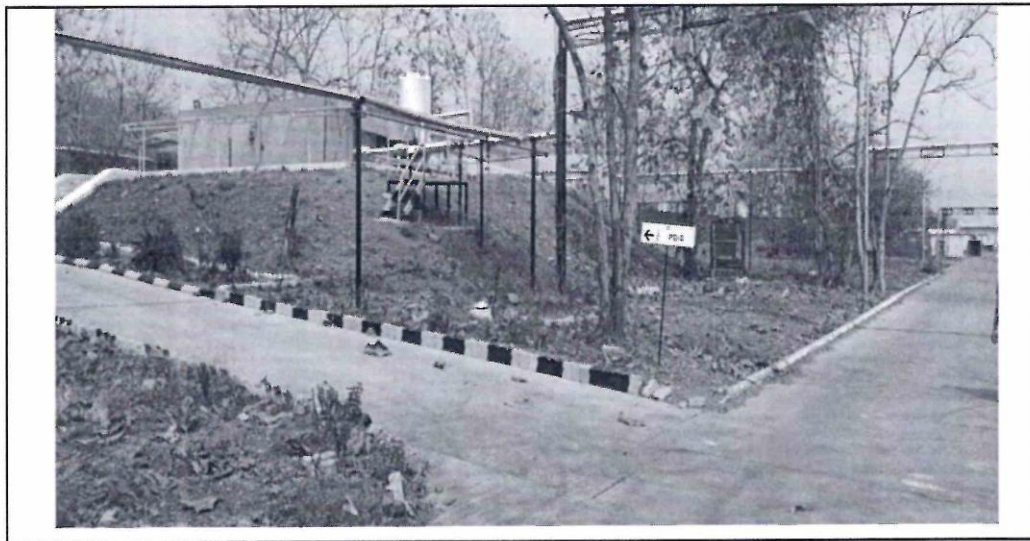
TPHOS: 2 doors and window were damaged which have been replaced.

**Photo : HRCPCH Building at the South Side of Incident Site :-**



PETN Drying (PD-2): There was no damage seen in the PETN Drying building (PD-2) located at the East side of the HR-CPCH-2.

**Photo : PD-2 Building at the east side of Incident Site :-**



From above, It is observed that due to the protection mound in the surrounding of the process building (HR-CPCH-2) blast effect was prevented mostly and barred travelling of shock waves outside buildings area and hence, no major damage observed in the other process building as well as nearby surrounding area with in the periphery of the factory site. However, due to minor shock effect and vibrations minor damage like cracking of window glasses and separating the doors from hinges and damage of FRP sheets which has been found. During site inspection of the incident site, it has been observed that there had no damage to the environment. There was no evidence of fire in the incident site and no damage to the nearby plantation has been noticed. Further, due to the effect of explosion the environmental damages of the water bodies of the surrounding area has not been observed.

As the location of Solar Industries India Limited factory situated at village Chakdoh, (Near Bazargaon) Tehsil Katol, Dist. Nagpur 440023 (Maharashtra) at the Latitude 21°2851-N and Longitude 78.7517-E.

The site location and distances in 10 km radius are as follows:

Distance from:	Distance (Km)	Name
• NH/SH	1.00	NH-53
• River	No	NA
• Bore Nallah	11	E side.
• Una Nallah	7.6	NE
• Lake (Talab)	3.0	Bazargaon
• Human Habitation	4.00	Bazargaon
• Ringanabodi	1.7	SW (Gram panchayat)
• Hardoli	3.0	W
• Dhaga	3.5	NE
• Panjra	2.5	SE
• Shiva	1.5	NE
• Bazargaon	3.5	E
• Hospital	11	PHC Kondhali
• Forest	0.5	Kondhali RF -N
• Religious place	No	NA
• Historical Place	No	NA

The company has owned land of 217.60 Hectare (537.7 acres), out of which manufacturing buildings, storage and other building construction has been carried out in 15.6 acres. Approx. 522.3 acres open land is available for plantation. About 10-meter periphery of the factory land has been covered with green belt. The company has obtained the forest clearance for the forest land 87.97- hectare. From Department of

Revenue and Forest, Mantralaya, Govt. of Maharashtra vide Letter No. FLD-3415/CR/FS/F-10 dated 15.04.2019.

**Habitation/ Population:** Nearest village is Bazargaon is located at the distance of 3.5 km East at the Nagpur- Amravati Highway no. 53. (earlier NH-6). According to last census in 2011, there are 784 households and 3233 people are living in this Village.

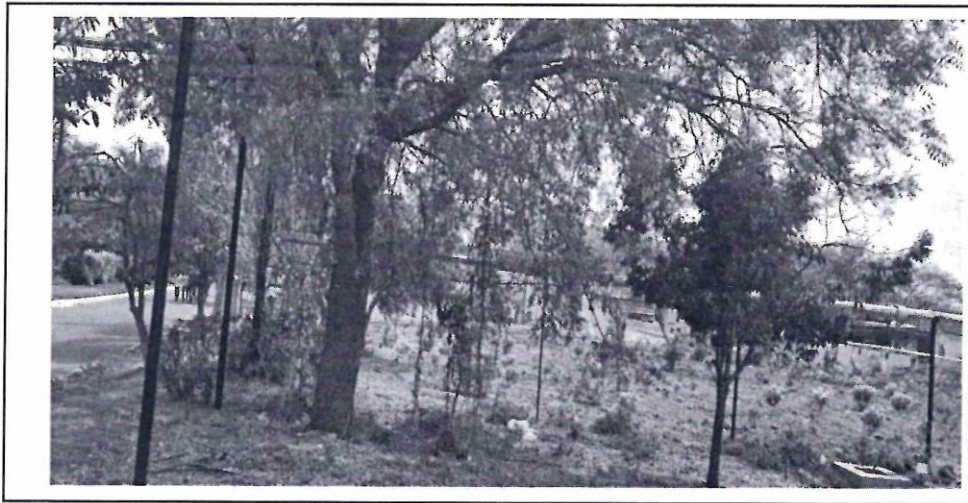
The clearances of factory boundary from the incident building No. HR-CPCH-2 are observed as following :

Direction	Location	Distances in meters
East	Boundary	487 meters
South- East	Factory Colony	656 meters
West	Boundary	1175 meters
North	Forest	261 meters
South	Main Gate	880 meters

During visit surrounding plantations photographs are as follows :-



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The Board officials was carried out Ambient Air Quality (AAQ) monitoring from 11:20 Am dated 17.12.2023 to 11.20 AM dated 18.12.2023 for 24 Hrs. The average of the AAQ analysis results of PM 10, SO<sub>2</sub> and NO<sub>x</sub> are as follows:

Sample No.	CPCB Permissible limit	MPCB BR-0059864			MPCB- BR-0060556			MPCB – BR-0060557		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
PM 10, µg/m <sup>3</sup>	≤ 100	258	341	299	177	433	320	50	185	132
SO <sub>2</sub> , µg/m <sup>3</sup>	≤ 80	11	25	18.5	11	26	18	6	18	11
NO <sub>x</sub> , µg/m <sup>3</sup>	≤ 80	23	30	27.8	22	32	26	18	26	22

The above mentioned AAQ results of SO<sub>2</sub> and NO<sub>x</sub> found well within the permissible limits of CPCB. However, Particulate matter (PM10) values found exceeding. This exceedance could be due to explosion incident and dispersion of dust particles in the environment, excavation of earth mound using JCB at the incident site and dumping of soil nearby plant site and vehicular traffic movement throughout AAQ monitoring carried out during the day hours.

**As directed by Hon'ble NGT, Environmental Damage Compensation Procedure:** Methodology adopted for assessing environmental compensation (EC) as per Board meeting No. 173 & CPCB guidelines and Hon'ble Green Tribunal (NGT). In the Chapter -I Hon'ble National Green Tribunal (NGT) Principal Bench in the matter of OA No. 593/2027/WP(Civil) No.375/2012 Paryavaran Suraksha Samiti & Anr. Vs Union of India & Ors. directed Central Pollution Control Board (CPCB) that: *The CPCB may take panel action for failure, if any against those assess accountable for setting up and maintaining STPs, CETPs and ETPs. CPCB may also assess and recover compensation for damage to the environment and said fund may be kept in a separate account and utilise in terms of an action plan for protection of the environment.* In view of above it is pertinent to mention that no such violation was reported [Point no. a) to c) & f)] in the subject incident. However, point 'd' has been considered that is "Accidental discharges lasting for short durations resulting into damage to the environment". The various environmental components are described in the following paragraphs.

The Environmental compensation calculation is done based on following formula:

$EC = PI \times N \times R \times S \times LF$
$EC (Rs) = 80 \times 1 \times 250 \times 1.5 \times 1.25$

Where,

EC	Environmental compensation in Rs.	
PI	Pollution Index of Industrial sector	Red category PI - 60-100, average PI considered as 80
N	Number of days of violation took place	1 day
R	A factor in Rupees for EC	R- factor considered 250
S	Factor for scale of operation	S- factor 0.5-1.5. Considered max. 1.5
LF	Location of factor	Population of Bazargaon town 5500 as on 2023 hence, LF considered 1.25

This formula incorporates the anticipated severity of environmental pollution in terms of pollution index, duration of violation in terms of number of days, scale of operation in terms of micro, & small/medium/large industry and location in terms of proximity to the large habitation.

(319)

However, there was no deviation observed in part of maintenance of ETP and STP and no wastewater discharge had occurred due to incident of explosion. The land environment has been decontaminated by removing of the soil and decontaminated under supervision of PESO and sent to CHWTSDF. However, due to explosion effect anticipated severity of environmental pollution regard to exceedance of AAQ on the day, considering calculation PI factors for large scale industry 80, other factors viz. R- 250, S-1.5 and Location factor 1.25 at the nearest town Bazargaon the Environmental compensation (EC) would be as follows:

$EC = PI \times N \times R \times S \times LF$
$EC \text{ (Rs.)} = 80 \times 1 \times 250 \times 1.5 \times 1.25 = 37500.00$
<b>EC = Rs. 37500.00</b>

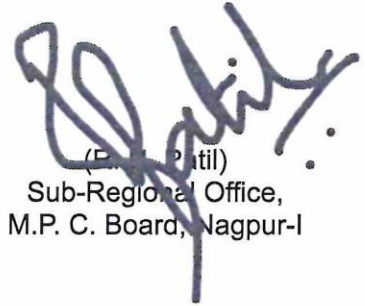
The above amount of EDC for 1 day is calculated on the basis of above CPCB guidelines & monitoring.



(Dr. S. K. Sharma)  
General Manager (Technical)  
Solar Industries India Limited



(Pramod Lone)  
Field Officer,  
M.P. C. Board, Nagpur-I



(P. P. Patil)  
Sub-Regional Office,  
M.P. C. Board, Nagpur-I



Maharashtra Pollution Control Board

महाराष्ट्र प्रदूषण नियंत्रण मंडळ

ANNEXURE No. 27

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Manifest For Hazardous And Other Waste

Submitted Date : 26-02-2024

Apply as Generator

Unit Name	Plant Name	Submit To
Solar Industries India Limited	Solar Industries India Limited	SRO-Nagpur I

Sender name and mailing address (including phone no. and email.)			
Sender Name	Sender Address	Sender Mobile No.	Sender Email
Dr. S. K. Sharma	village chakdoh ( Bajargaon ) Dist. Nagpur- 440023	9665081945	s.sharma@solargroup.com

Sender authorisation No	Manifest Document No	Membership No (if any)
Format1.0/CAC/ UAN No.0000119394/CR2201001112 Date 25.01.2022	MPCB-HW_MANIFEST-0000465689-337119	33000769

Transporter's name and address (including phone no. and email.)				
Transporter Name	Vehicle No.	Transporter Address	Transporter Mobile No.	Transporter Email
M/s. MAHARASHTRA ENVIRO POWER LIMITED, CHW-01, MANDWA VILLAGE, BUTIBORI MIDC AREA, NAGPUR-441122	MH40CM5802	Plot No. CHW-01, CHWTSDF, MIDC, Butibori village Mandawa, Tah. Hingna, Dist. Nagpur	9923596274	mepnu.mkt@smsi.co.in

Waste Disposal Details												
Sr No	Date	Waste Category	Waste Name	Waste QTY	Waste Unit	Waste Disposal To	Facility	State	Name of unit	Address of unit	Contact of unit	Email of unit
1	26-02-2024	37.2 Ash from incinerator and flue gas cleaning residue	Incinerator burning ash	1240	MT	CHWTSDF	Maharashtra Enviro Power Limited, Nagpur unit	Maharashtra	Maharashtra Enviro Power Limited	Nagpur unit	9923596274	mepnu.mkt@smsi.co.in
Number of Containers				Physical Form				Special Handling Instructions And Additional Information				
50				solid				use PPE's				



*Handwritten signature*

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SOLAR INDUSTRIES INDIA LTD.  
BAZARGAON, NAGPUR NAGPUR-440023

Slip No	::	102680	Truck No::	MH4CCM5802
Party	::	MAHARASTRA ENVIRO PO	Source ::	TIPPER
Product	::	CONTAMINATED SOIL WASTE ASH		
Transporter	::	MAHARASTRA ENVIRO POWER LIMITE		
Gross Wt	::	9520	26/02/24	11:29:16:AM
Tare Wt	::	8280	26/02/24	10:25:53:AM
Net Wt	::	1240	Unit	Kg.

*[Signature]*  
Prepared by

Checked by

Weigh Bridge By : (El Weigh) Sensors & Systems. Phone- 0712-2290777

Dated 09.03.2024

Ref: SIIL/MPCB/2023-24/05

To,  
The Regional officer  
Maharashtra Pollution Control Board  
Nagpur.

**Sub: Disposal of Explosive Contaminated Soil & Hazardous Waste collected from Accident Site of M/s Solar Industries India Limited, Chakdoh, Nagpur (Maharashtra)**

**Factory Location:** M/s Solar Industries India Limited (SIIL) is involved in the manufacturing and supply of explosives and initiating devices. The factory is located at village- Chakdoh (Bazargaon) Tehsil- Katol, District - Nagpur 440023 State- Maharashtra.

**Products Manufactured:** SIIL involved in the production of commercial explosives viz. Emulsion & Slurry explosives, Bulk Emulsion, Cast booster, Detonating Fuse, Detonators, PETN and defence products like HMX & RDX compound products and TNT and supplied in mining sector and Ordnance factories, DRDO and Armed Forces in India and leading exporter of the Defence products.

**Manufacturing Licence & Consent:** SIIL granted manufacturing licences from Petroleum and Explosives Safety Organization (PESO), and MPCB Consent to Operate in Red /LSI category vide Format No. 1.0/CAC/UAN No.0000119394/CR-2201001112 dated 25.01.2022 under section 26 of the Water (Prevention & Control of Pollution) Act, 1974 and under sec. 21 of the Air (Prevention & Control of Pollution) Act, 1981 and Authorisation under Rule 6 of the Hazardous Other Waste Wastes (Management & Transboundary Movement) Rules, 2016. Validity of Consent up to 30.06.2026.

**Brief about Incident:** On 17.12.2023 at about 8:45 AM an explosion accident had occurred at HMX/RDX Compounded Products Casting House building no. HR-CPCH-2 during sieving of TNT. Due to blast effect process building got collapsed. There were 9 workers fatalities out of total 11 workers in the shift and 02 workers survived as they were outside process building. List of workers enclosed as Annexure-1.

**Generation of hazardous Waste:** The process building (HR-CPCH-2) was licensed for manufacturing of HMX/RDX Casting & Packing purpose. TNT is used as raw material for melting and casting. During accident approx. 140 Kg TNT was available on 02 sieving tables. Due to blasting most of the explosive (TNT) would have exploded however, some of the un-blasted TNT spread in the building. During rescue operation debris and soil mound was removed under supervision of officers of PESO. The TNT contaminated soil 1832.9 Kg was collected in Polythene bags. This material was preserved in the TPHOS Store as advised by officer of the Chief Controller of Explosives Nagpur.

**Legal Action & Status:** Licence of manufacturing of TNT and HMX/RDX Compounded Products Casting House (HR-CPCH-2) was suspended vide Chief Controller of Explosives letter No. E/HQ/MH/20/90(E89848) dated 20.12.2023 and licence No. E/HQ/MH/20/98(E113453) dated 20.1.2023 respectively. Later, after completion of investigation of the incident and site inspection by PESO officers, above-mentioned licences have been revoked by The Chief

**Solar Industries India Limited**



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Controller of Explosives on 13.02.2024. In view of above disposal of contaminated soil waste could not be done.

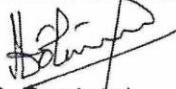
**Assessment of Environmental Components:** SILL has installed AAQ monitoring stations, OCEMS on Boiler stack and ETP based on MEE to compliance ZLD. The blast effect of explosion was confined within building as protected through earth mounds. There was no use of water in process and hence, no water environment had affected. The energy released due to explosion of TNT was instantaneous. However, minor dust emission occurred during blast and removal of debris through JCB. The contaminated soil was collected and decontaminated prior to disposal to CHWTSDF.

**Procedure of Decontamination & Disposal of Contaminated HW:** The TNT contaminated soil bags were taken through covered van to the PESO approved Explosives waste Burning & APC site within the factory premises. The soil was transferred into SS tray and soaked in water to desensitize the TNT explosives residues. Further, material is spared over RCC lined pits for sun drying. The dried soil is incinerated in the tray within the incineration chamber. The cooled material is collected in HDPE bags. This activity was performed under the guidance of competent person and supervision of PESO Officers. Finally, Incineration Ash (HW Category 37.2) Quantity 1240 Kg. was disposed to Maharashtra Enviro Power Limited, CHW-01 Mandwa, Butibori MIDC Area Nagpur vide MPCB-Manifest 0000465689- 337119 on 26.02.2024. Copy of Manifest enclosed as annexure 2. Details of TNT Contaminated Waste Treatment & Disposal

Sr. No	Type of Waste (Cat.37.2)	Date / Duration	No. of Bags	Wt. of Waste (kg)
1	Collection of TNT Contaminated Soil	17.12.2023 to 19.12.2023	166	1832.9
2	Soaking of Waste Soil in Water	14.02.2023 to 16.02.2024	166	1832.9
3	Drying of decontaminated soil waste	15.02.2024 to 18.02.2024	--	1534.0
4	Incineration of soil waste	17.02.2024 to 23.02.2024	65	1335.0
5	Collection of incinerated ash	18.02.204 to 25.02.204	60	1240.0
6	Disposal of Ash to CHWTSDF	26.02.204	60	1240.0

From above data it is evident that about (1832.9-1534) =298 Kg stones and RCC material recovered from waste, moisture (1534-1335=199 kg) removed during drying, and TNT contaminated soil incinerated (1335-1240 =95 Kg) and 1240 Kg. hazardous waste was collected and sent to CHWTSDF. This is submitted for information and record.

For Solar Industries India Limited

  
(P.P. Deotare)

Sr. General Manager (Works)

**Solar Industries India Limited**

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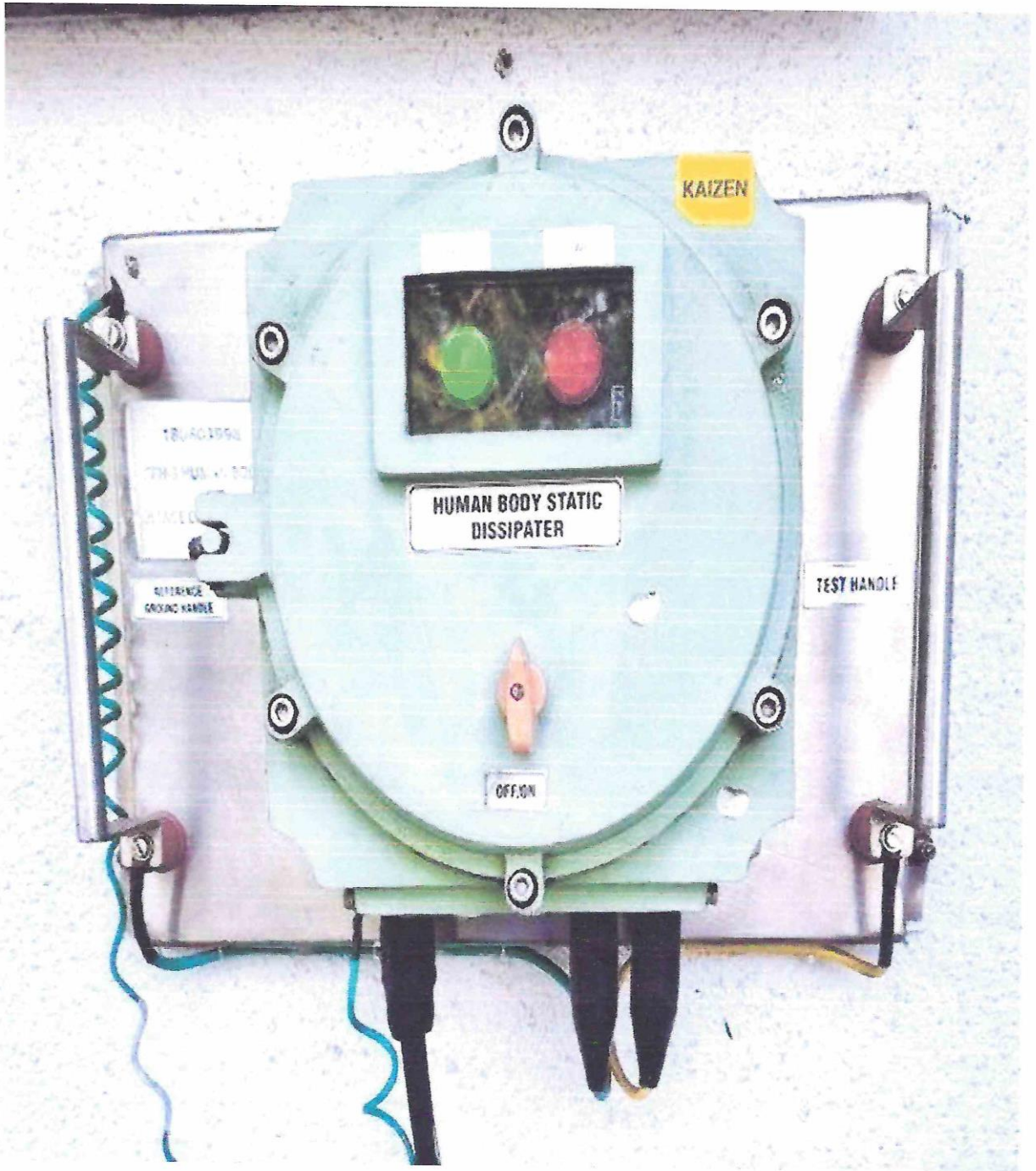


Fig: Screening Machine Installed at the TNT Manufacturing Plant

ANNEXURE No. 30

Photograph of New Human Body Static Dissipation System

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