

COMPLIANCE REPORT OF THE RECOMMENDATIONS OF THE SAFETY AUDIT-2025

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**ISO 9001:2015, ISO14001:2015 AND
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COMPLIANCE STATUS OF SITE SPECIFIC RECOMMENDATIONS FOR SAFETY AUDIT-2025

S.No	Observations	Compliance Status
1	CMS PLANT	
	1. Observed Chloroform 200 liter drums stored over the road in the open atmosphere. If chloroform is released to the atmosphere due to the failure of the carboy could result in a serious health hazard. It is advised to store it in a dedicated storage only 2. Access the Fire Monitor is blocked with Chloroform 200ltr carboys and could result in a delay in fire response time. Hence, it is advised that clear access shall be maintained by marking no storage zone near the fire monitor area. 3. AFFF carboys stored in open atmospheric conditions. Atmospheric conditions could result in poor performance of AFFF, which is not desirable in a firefighting situation. Hence shall be stored in controlled weather conditions. 4. Label regarding Manufacturing date and expiry dates are missing on the AFFF solution carboy. Manufacturing and expiry dates at AFFF carboys shall be ensured.	1. Chloroform 200 L drums are shifted to a designated storage area with proper containment. 2. Obstruction near fire monitor has been cleared. "No Storage" markings provided to ensure free access at all times. 3. AFFF carboys are provided with PP sheet shed to avoid exposure to atmospheric conditions. 4. All AFFF containers are now labeled with manufacturing and expiry dates. Periodic inspection is implemented.
2	CMS COMPRESSOR HOUSE	
	5.4 No of compressors are located in the building, ID No and test dates are not available at the safety relief valve (SRV) of all 4 compressors. SRV ID No and test dates shall be made available 6. One cable hanging with exposed conductor (insulation removed) at the motor side of Compressor ID No: C2101C. cable insulation shall be ensured. 7. The electrical switch cover is missing at the compressor C2101A. Cover needs to be provided. 8. EOT crane at CMS1, Capacity 10 tons SWL and Test dates are not available. Test dates shall be made available near to the crane. 9. Canteen, MCB switch distribution box near wet grinder area kept open condition all electrical conductors are exposed. The MCB distribution box cover shall always be kept closed. Hazard communication like DANGER, not to open, shall be displayed at door	5. Safety Relief Valves (SRVs) of all compressors are now tagged with ID numbers and test dates. Records are maintained. 6. Damaged cable has been properly insulated and secured properly. 7. New switch cover has been installed to ensure safety. 8. Tested date is displayed near the crane. Test records are maintained. 9. MCB box is kept closed and danger board is displayed.

S.No	Observations	Compliance Status
	10. Two LPG gas cylinders are attached to the gas manifold, and the entire system is located inside the building. In case of gas cylinder failure inside the building could result in a serious explosion. Hence, it is advised to relocate gas cylinders and the manifold outside the building in well-ventilated area under the shade to prevent explosions. 11. Gas cylinders connected to the manifold directly without any isolation valve; if the regulator fails, there is a probability of gas leakage during cylinder changing time. Hence, shut off valve shall be provided for each cylinder at the gas manifold. 12. Quick shut-off valve not provided at Manifold out let to the kitchen. LP gas handling system shall be provided with at Manifold out let and at the usage end also to shut off the gas immediately during an emergency. (refer OISD regulation)	10. LPG Cylinder and manifold are relocated outside the building in a well ventilated area with proper shading arrangements to prevent heat exposure and reduce explosion risk. 11. Individual shut off valves are installed for each gas cylinder connected to manifold to prevent gas leakage during cylinder replacement. 12. Shut-off valve have been provided at manifold outlet.
3	BRINE PLANT	
	Salt Yard: 1.Raw material being unloaded with power shovels, Standard wheel blocks are to be provided to the truck wheel stopper event accidental rolling of truck due to power shovel operations in line up with CMV rules 1989 (R138). 2. Brine solution pumps motor earthing strips are getting corroded at weld joints and earthing continuity fails, need to be checked and rectified. 3. Brine solution pumps base is getting corroded, needs painting or to be replaced. 4.The pumps are found to be running with continuous seal water causing water wastage, seals to be repaired. 5. One of the Bucket Elevator (stand by elevator) has casing its damaged and has holes. Needs to be repaired to prevent leaks. 6. At the Elevators pit approach area side railing to prevent fall in to pit found damaged to be rectified to prevent the incident of fall hazard in to pit.. 7. Salt hopper bottom pit approach stair case is not proper, it is neither a cat / monkey ladder nor a stair case. It is to be properly laid.	1. Heavy duty portable wheel chocks(yellow) are provided to trucks during unloading operations. 2. Damaged earthing strips are being replaced and continuity restored. 3. Corroded pump base was painted to prevent further deterioration. 4.Pump seal is repaired to prevent water wastage 5. Damaged casing of standby bucket elevator was repaired. 6. Handrail is provided to ensure adequate fall protection. 7. Approach staircase with handrail to bottom hopper is provided.

S.No	Observations	Compliance Status
	8.Maintenance persons are using electrical plug socket without proper plug. Found bare wires are inserted in the plug sockets at salt area MCC room. Also supply to two equipment is taken from single socket in the same way. This practice should be avoided by having strict vigilance and control of activity. 9. Sulfate removal system (SRS) one pump located in a pit of 2500mm depth, above the pit work platform is located and no guard rail is provided to prevent the risk of accidental fall into the pit. Guard railing shall be provided with reference to IS 4912 – 1938.	8. Plug tops are provided to maintenance persons and unsafe practices are eliminated. 9.Hand rail is provided to the pit at SRS plant
4	K2CO3 PLANT:	
	1. Liquid Carbon dioxide CO2 Storage tank area: There is no proper access for the local electrical control panel. The control panel is to be relocated to a safer location. 2. All the process equipment is provided with guards, and no guard conforms to standards and running parts are accessible. Hence, it is advised to redesign all the guards suitably with reference to IS: 9474-1980. 3. Lot of frost deposition was noticed over the CO2 supply line at the storage tank area. Some part of the CO2 supply line that passes close to the floor level is accessible with probable risk of frostbite injuries. Hence, it's required to provide insulation over the line where people move, and HAZCHEM information shall be displayed in a standard size of 600 mm x 450 mm (recommended for 10 -15m viewing), refer IS 9457: 2005 - Safety colors and safety signs - Code of practice. 4. Chiller unit at CO2 storage tank. Local electrical panel body earthing is missing. Same is to be rectified	1. Access to control panel provided. 2. Appropriate guards are provided ensuring complete enclosure of moving parts. 3. Insulation has been provided on CO2 Supply line. 4. Earthing provided for the local electrical panel of chiller unit.

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5	CHLORINE PLANT:	
	1. Observed drain loops of 7th, 8th, 9th, 10th and 11th cell hose found terminated at about two meters height, approximately above the floor level. Whenever the seal overflows and there is a possibility of overflowing liquid splashing over the floor and the persons who are working nearby. Hence, it is required to extend the drain loop up to the floor routed suitably to the nearby effluent drain. 2. Permit to work NO 1375 issued for civil work for working on scaffolding, and persons are allowed to move under the scaffolding. No barricading was provided to prevent persons' movement. Advised to strengthen the mill work at Policy and needs to train all affected employees 3. ID Nos not provided to the eye and body wash showers, eye & body wash drench located at the chlorine compressor area, not firmly fixed to the bottom 4. No insulated rubber mat available to the electrical local panel at the compressor K-701-F. advice to provide an insulated rubber mat confirming to the a IS 15652 (2006) in line up with regulation 21 of CEA rules 2023 5. Flange guard found missing at sulfuric acid storage tank manhole dummy D 602 and D602A. Suitable flange guard required to prevent unexpected emergencies. 6. Sulfuric acid Pumps ID number 607 A & 608 C Pump Motors Drive coupling. Guards not fastened firmly. The guard needs to be fixed to the base frame at both sides, suitable to prevent the guard from flying out in case of pump drive coupling failure (refer IS:9474-1980 for guarding requirement). 7. Sulfuric acid dyke entry found not secured. It is required to provide a gate with suitable access control to prevent unauthorized entry (preferably LOTO). A suitable HAZARD communication board needs to be displayed at the entry point.	1. Drain loops are extended to floor level and connected to the effluent drain to prevent splashing. 2. Barricading is provided below the scaffolding to restrict unauthorized movement. Work area secured. All affected employees have been trained on safe work practices and permit-to-work requirements. 3. Identification numbers are provided to eyewash shower sets in the plant. Eyewash shower sets are now firmly fixed to the base and made fully accessible at the chlorine compressor area. 4. Insulated rubber mat conforming to IS is provided at compressor K-701-F local electrical panel, in compliance with Regulation 21 of CEA Rules 2023. 5. Flange guards are provided at manhole dummy locations D-602 and D-602A to prevent accidental chemical exposure. 6. Coupling guards of sulfuric acid pumps (607A & 608C) are properly secured and firmly fixed to the base frame on both sides. 7. Unauthorized entry is strictly prohibited and Hazard communication signage is displayed.

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	8. The sulfuric acid filling point is found available near the sulfuric acid pumps area, and the filling area is not secured; filling receptacles are not labelled. In safety point of view filling area needs to be secured suitably by providing suitable, substantial barricading with access control. Filling receptacles shall be labelled in line with requirements as said in Sec 87AP Factory rules 95 under Schedule XX (handling and manipulation of corrosive substances). Only trained persons shall be allowed to fill the activity under strict supervision. 9. Rotating parts and running “V” nip points are found unprotected and exposed at chlorine compressors and air compressors. It is required to modify the guards in line up with IS: 9474-1980. 10. Painting workers found using an “A” type self-supported ladder for painting works, but the employee positioned himself at the topmost rung and was doing a painting job in this process, there is a probability of a person falling from the ladder due to imbalance. Hence, it is required to identify all affected employees and train them in safe working procedures of working at height and safe usage of ladders. 11. Safety relief valve of air compressor ID numbers, capacity and test dates are not displayed at the location. As part of the best safety practices, ID numbers, capacity and test dates shall be displayed at the location	8. The sulphuric acid filling area is barricaded with restricted access. Filling receptacles are properly labeled as per AP Factory Rules (Sec 87, Schedule XX). Only trained personnel are authorized to carry out the activity under supervision. 9. All exposed rotating parts and ‘V’ nip points in chlorine and air compressors are provided with guards. 10. All painting personnel are trained on safe working at height and proper ladder usage. Use of the topmost rung of “A” type ladders is strictly prohibited. Concerned paint Supervisor checks to ensure compliance with safe practices. 11. Safety relief valves of air compressors are now clearly marked with ID numbers, capacity, and test dates at the respective locations to ensure traceability and compliance with safety standards.

S.No	Observations	Compliance Status
6	Chlorine Gas Filling Area:	
	1. Chlorine leak detector sensors are mounted at a height of more than 5 feet in the Filling cubicle cabin. As chlorine is approximately 2.5 times heavier than air, it takes a lot of time to reach the chlorine leak detector. From a safety point of view and effective control of leak detection and control, the chlorine leak detector sensors are to be mounted close to the floor (approximately 300 mm above the floor). 2. Chlorine filling cubicles are provided with automated closing doors to contain chlorine inside the hood during accidental failure of the filling procedure. Some doors are wedged to prevent them from closing. During an emergency, this type of process failure could result in serious consequences. Hence it is advised to discourage unsafe workplace attitudes, making arrangements to prevent functional process automatic closing of cubicle cabin doors. 3. Inside the Chlorine filling cubicle, a suction hood (scrubber ID fan inlet duct) is provided to suck and deliver the chlorine gas to the scrubbing system for neutralizing. But the suction hood is terminated at about 900 mm from the floor level, and its damper is kept in closed condition. Since chlorine gas is heavier than air scrubber sucks air instead of chlorine, which is accumulated at floor level, and it is very difficult to open the suction hood damper during a raised emergency condition. Hence, it is advised to review the scrubber hood position and the damper operating process. In safety point it is better to bring down the hood opening as close to floor level and keep the damper always in open condition.	1. Chlorine gas leak detector sensors are repositioned to approximately 300 mm above floor level to ensure early detection, considering chlorine gas density. 2. All wooden or clamp wedged of automatic doors has is removed. Doors are now maintained in fully functional condition to ensure automatic closure during emergencies. Annual Maintenance Contract (AMC) has been given to M/s Shakti Hi-Tech, Chennai for periodic maintenance and servicing of doors. The contract carries out inspection, preventive maintenance and necessary repairs to ensure proper functioning and safety. Awareness has imparted to employees to avoid unsafe practices. 3. The suction hood is extended closer to floor level to effectively capture chlorine gas. The damper operating system has been reviewed and maintained in normally open condition to ensure immediate effectiveness during emergencies.

S.No	Observations	Compliance Status
	4. Adequate number SCBA sets. Airline masks are provided to meet the emergency during chlorine leak. It is observed that a lot of dust got accumulated inside the Face hood of SCBA set and airline masks. If anyone inhaled the dust that accumulated inside the hoods may cause serious respiratory illness. Hence, it is advised to maintain the hoods free from dust accumulation. 5. Airline respirator supply line found heavily corroded outside. It is needed to check the corrosion condition inside the pipeline. It is also advised to provide corrosion resistant metal tubing for breathing airline respirators. 6. It is learnt that moisture, oil and chemical filters are not made available on the breathing air supply line. Inhaling raw air may cause for respiratory hazard. From a safety point of view, moisture, oil and chemical filters shall be made available to filter all contaminants, and breathable air quality shall be ensured to prevent respiratory risks.	4. All SCBA sets and airline masks are thoroughly cleaned, and dust accumulation inside face hoods is removed. A periodic inspection and maintenance schedule is implemented to ensure cleanliness and hygiene of all respiratory protective equipment. 5. The corroded airline supply line is inspected internally and externally. Damaged sections have been replaced with corrosion-resistant metal tubing to ensure safe and reliable breathing air supply. 6. Moisture, oil, and chemical filters have been installed in the breathing air supply line. Air quality is now ensured as per safety requirements to prevent respiratory hazards.
7	HCL Plant	
	1. All air blowers running shafts and “V” running nip points found unprotected and accessible with a potential hazard of body part entanglement in running nips. Guards needs to be modified Suitably with reference to IS: 9474-1980. 2. SCBA, along with storing cabinet positioned outside the room, is exposed to the open atmosphere and a lot of dust accumulation is noticed inside the SCBA face mask. Dust may create respiratory health problems. Advise to relocate SCBA to nearby location where it is not exposed to open atmospheric condition.	1. All rotating shafts and ‘V’ nip points of air blowers have been provided with suitable guards in accordance with IS 9474:1980 to prevent entanglement hazards. 2. SCBA sets have been relocated to a protected indoor location with proper storage cabinets to prevent exposure to dust and environmental contamination. Regular inspection and housekeeping practices have been implemented.

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	3. HCl furnace 2 nd floor and operating floor, parapet wall found removed and unprotected due to building maintenance activity. The same shall be protected by providing a wall, if opening is required, same can be protected by providing a suitable removable guard railing and display hazard communication on the hazard of falling from height.	3. Parapet wall at HCl furnace (2 nd floor and operating floor) is provided.
8	OLD EVAPORATION PLANT:	
	1. Flange guards were found missing at some areas. 2. Observed flame / Gas cutting equipment being used without flashback arrestors at the regulator. Flame / Gas Cutting set is to be provided with flash back arresters at the regulator (as per S I 1323 – 1982) and a non-return valve at the cutting torch and pressure gauges and regulator to ensure safe cutting operations. Gas cutting requires inspecting with check list every time before using. 3. Fork Lift ID No: E2 was found without SWL marking and test date, and the reverse horn is also not working. Advised forklifts required to inspect with check list for its functional condition every time before using. 4. New pipeline rack. Civil construction work is in progress at new store building area using a non-standard wooden scaffolding. Using nonstandard scaffolding for height works could result in serious emergencies. Advised to use standard scaffolding (refer IS 3696 (Parts 1 & 2)) of working at heights. 5. 9th de-chlorination plant area, local electrical switch station converted into lab, working close to the electrical installation is not advisable due to electrical hazards, which is against to the CEA 2010 rules. Advice to relocate the lab to a safer area.	1. All missing flange guards are provided at the identified locations to prevent chemical splash and leakage hazards. 2. Flashback arrestors are provided at regulators, and non-return valves have been installed at cutting torches. Pressure gauges and regulators are ensured in proper working condition. A pre-use checklist is implemented for all gas cutting and periodically checked. 3. SWL marking and test date are displayed on the forklift. The reverse horn has been repaired and is now functional. A checklist-based inspection system has been implemented before each use. 4. Non-standard wooden scaffolding removed. Standard MS scaffolding is provided. 5. The lab previously located near the electrical switch station is relocated to a safer location.

S.No	Observations	Compliance Status
9	NEW HYPO PLANT:	
	1 No insulated rubber mat provided at the instrument panel of the New hypo plant. Insulated rubber mat shall be made available at the panel. 2 SCBA cabin fix inside the panel room over the wall, and it is very difficult to access. Needs to relocate at accessible height to access easily in case of emergency. 3 Observed Civil construction employees attending construction work with ordinary rubber shoe some shoes were found torn out. Using substandard shoes may cause serious injuries. Hence, it is advised to ensure foot protection conforming to IS 15298 (Parts 1-4) to prevent injuries. 4 Dilute caustic tank 108 dyke access provided with RCC stairs up to 2000mm height. But no fall protection was provided to the RCC staircase leading to dyke to prevent falling from height while ascending or descending the steps. Hand railings/guard rails are required to be provided in line up with is.4912.1978 to ensure falling from height and to ensure three-point contact while ascending or descending the steps. 5 Exhaust fan not provided to the Battery room located at panel room ID HYPOEMCC 1&2 to prevent cell gases accumulation, which may cause fire incidents. Suitable exhaust system shall be provided to prevent cell gases accumulations.	1. Insulated rubber mats conforming to relevant standards are provided at the instrument panel to ensure operator safety. 2. SCBA set is relocated from the panel room wall to an easily accessible location at an appropriate height for quick use during emergencies. 3. All construction workers are provided with safety shoes conforming to IS 15298 (Parts 1–4). Use of damaged or substandard footwear has been strictly prohibited. 4. Handrails have installed along the RCC staircase leading to the dyke of dilute caustic tank 108 to prevent fall hazards during access 5. Suitable exhaust fan is installed in the battery room to prevent accumulation of cell gases and mitigate fire/explosion risk.

S.No	Observations	Compliance Status
	6 Access to the mechanical store provided through the electrical panel room ID HYPOEMCC 1&2 and passing through the electrical panel is risky and nonconforming to the CEA 2010 regulations. Advised to provide a dedicated passage to the mechanical store. 7 A lot of mechanical items are stored in the electrical panel room ID HYPOEMCC 1&2, which is against to the CEA2010 regulations. 8.750 KVA Emergency DG Set located near to the electrical panel room ID HYPOEMCC 1&2; fuel tank of capacity 950 litres is not provided with secondary containment. Suitable secondary containment shall be provided. 9 750 KVA Emergency DG set: Appropriate firefighting requirements are not available to meet the diesel tank fire,. Suitable capacity Mechanical Foam type Extinguisher needs to be provided. 10 Pumps ID No: P101 A, B, & C located inside the Tank 108 Dyke, pump coupling guards are not fastened at both sides. Pump Guards needs to be fixed to the base frame at both sides, suitable to prevent the guard from flying out in case of pump drive coupling failure (refer IS:9474-1980 for guarding requirements). 11 Pumps ID No: P101 A, B, & C located inside the Tank 108 Dyke; if the tank fails these pumps can submerge in the dye with tank content process will be hampered. Hence, it is required to relocate the pumps outside the dyke to safely guard the pump and drive motor. 12 Pump ID No P1 1205 A&B Pump coupling rotating part are accessible. Guarding neds to reviewed with reference to IS: 9474-1980. 13 Hypo storage tank D1202 H 65 KL not provided with dyke. Tank shall be provided with a dyke to contain the tank content in case of tank failure refer in Sec 87AP	6. A dedicated access pathway to the mechanical store has been provided, eliminating the need to pass through the electrical panel room and ensuring compliance with CEA 2010 regulations 7. All mechanical items are removed from the electrical panel room. The area is now maintained exclusively for electrical installations as per CEA 2010 requirements. 8. Secondary containment (dyke) has been provided for the 750 KVA DG set fuel tank (950 litres capacity) to contain spills and prevent environmental hazards. 9. Mechanical foam type fire extinguisher of cap. 9 L is kept near the DG set to address diesel fire risks. 10. Pump coupling guards for pumps P101 A, B & C are securely fastened on both sides to the base frame. 11. Shifted to out side of the Dyke. 12. Weld mesh guar is provided for pumps P1205 A & B to fully cover accessible rotating parts. 13. A dyke is constructed around the hypo storage tank D-1202 to contain tank contents in case of leakage or failure.

S.No	Observations	Compliance Status
	14. Storage tanks D-120 E, F, G 65 KL each located in a single dyke. This dyke provided drain line without a valve. Drain valve shall be provided, and the valve shall be kept closed at all times.	14. Storage tanks D-1202 E, F, G 65 KL. Each located in a single dyke. This dyke provided drain line without a valve. Drain valve is provided, and the valve is kept closed at all times.
10	CELL HOUSE:	
	1. Cell house No:9 electrical bus bars are accessible. Access shall be protected by providing suitable guard railing and display hazard communication on LIVE bus bar hazards. 2. The elements lifting floor opening is protected with guard railing, which is not adequate as mid rail is not provided. Guard railing shall be reviewed with reference to IS 4912 - 1938	1. Hand rail provided to restrict access to electrical bus bars. 2. The elements lifting floor opening is protected with guard railing.
11	COMPRESSOR HOUSE:	
	1. Compressor ID no K2777 C, & D provided with substandard guards running parts are accessible through the guard with a potential hazard of body part entanglement in running nips. Guards needs to be modified suitably with reference to IS: 9474-1980. 2. No insulated rubber mat was provided to the electrical panel near the compressor K2777 C area. Insulated mats shall be provided. 3. Nitrogen compressor drive Guards are not adequate. Guards need to be modified suitably with reference to IS: 9474-1980. 4. Temporary cables are drawn over the floor for fabrication activity at the outside building. These cables may entangle with the foot, resulting in person-trip incidents. Similar conditions were observed at other locations, construction and maintenance activities. Hence, advised to develop a temporary cable policy to ensure safety.	1. Suitable belt driven guards are provided to prevent access to running parts. 2. Insulated rubber mat provided. 3. Nitrogen compressor drive Guards are modified to prevent from rotating parts. 4. Temporarily cables are properly routed across all areas.

S.No	Observations	Compliance Status
	5. Instrument air compressor K-2777-C provided an operating platform at 400mm height from the floor level. Platform found unprotected toward the building entry point and there is a probability of falling from the platform. Hence, advised to provide guard railing to the platform's unprotected edge.	5. Hand rail is fixed at the unprotected edge of the platform.
12	Power Plant:	
	1. Power plant over all housekeeping is good. 2. It is good to note that QESH policy etc., are found displayed in the control room. 3. Lightning protection system is to be studied and to be provided accordingly to cover entire area. 4. For the air receiver tank (D – 730A) pressure gauge, SRV calibration is due as per tag it is due on 16.07.2025. Ensure the same for all the pressure vessels in the plant. 5. Scaffold found erected for maintenance activity, tagging is not evident to know the status / condition of the scaffold for using it. Ensure to put the relevant tag to certify the use of scaffold. 6. There are about three number of breaker lifting trolleys in the MCC, test certification for these is not evident as these are coming under lifting tools they are to be tested and certified by competent person and provide a tag to the trolley regarding tested and due date of testing. 7. In the MCC smoke detectors wiring found to hanging, to be fixed properly.	1. Good housekeeping standards are being consistently maintained across the power plant area. 2. QESH policy and related safety information are prominently displayed in the control room for employee awareness. 3. Lightning protection study is conducted in the recent past by third party M/s ELECON, Gujarat and awaiting for report. 4. Calibration of pressure gauge and SRV for air receiver tank D-730A is completed. 5. All scaffolds erected for maintenance activities are now provided with proper color coded tagging to indicate inspection status and fitness for use, i.e. Green – safe for use, Red-Do not use and Yellow-Under erection. 6. All HT breaker lifting stand is provided by supplier only. 7. Loose wires of smoke detectors are properly dressed.

S.No	Observations	Compliance Status
	8. In the generator floor lot of spare material (seems to be heavy) found stored on the floor, Integrity of the floor slab to hold the weight of the material to be ensured.	8. Excess and heavy materials are removed. Floor load-bearing capacity is verified, and proper storage practices are being followed.
13	HYDROGENATION (AUTO CLAVES):	
	The hydrogenation system totally is not working at the time of audit and no maintenance activity observed. Observations given are based on the inter action with the operator at the work place and walk through observations. ☐ Hydrogenation plant housekeeping is to be improved, unwanted material, dust is found at the top platform of Auto claves. ☐ There shall be two escapes from the installation building. ☐ Autoclave earthing strips continuity is to be ensured. ☐ Emergency Response, direction to assembly points list of first aiders, rescue team members etc., are not displayed at the section. These are to be clearly displayed for the awareness of persons working at the area. ☐ The inter communication / PA system phone at the operator table found to be not working. ☐ Hydrogen leak detectors are to be calibrated as scheduled and the updated tags are to be displayed so as to know the tested date and due date of next testing and calibration. ☐ Pressure indication gauge is provided between Rupture Disc (RD) and SRV, consider providing a transmitter to indicate the pressure on panel also and audiovisual display for real time indication of the failure of RD to the operator concerned. ☐ For the step ladder provided for going to the top platform of auto claves, only one side railing was given, provide railing on the second side also for ease of climbing up.	☐ Housekeeping in the hydrogenation plant, including autoclave top platforms is improved. Unwanted materials and dust are removed, and regular cleaning practices are implemented. ☐ Two safe escape routes have been ensured from the installation building in compliance with safety requirements. ☐ Earthing strips of autoclaves are checked, and continuity is ensured for safe operation. ☐ Emergency response information, including escape routes, assembly points, first aiders, and rescue team details, has been clearly displayed at the workplace for awareness. ☐ The intercom phone at the operator table is repaired and is now functioning properly. ☐ All hydrogen leak detectors are calibrated as per schedule. Updated calibration tags indicating last calibration date and next due date is displayed. ☐ We will review internally and if necessary we will provide transmitter with audio visual display. ☐ Additional railing has been provided on the second side of the step ladder to ensure safe access to the top platform.

S.No	Observations	Compliance Status
	☐ Pressure gauge, SRVs are to be calibrated once in six months by competent person as per AP factories rules 1950 related to pressure plant under section 31 of factories act 1948 and rule 56 of the AP factories Rules and calibration date and due date of calibration is to be displayed on the SRV / pressure gauge, For the SRVs / pressure gauges on the auto claves the Calibration found to be due. ☐ Vents, including those of pressure relief devices, shall be arranged to discharge in a safe place in the open air so as to prevent impingement of escaping gas on to personnel or any structure. ☐ SRV and RDs are to relieve the pressure to safe location such as a dump tank of suitable capacity as designed and the dump tank also should have a vent relieving to safe location. ☐ Consider providing High-pressure audio-visual alarm for any increase of pressure in auto claves, so as to take immediate action by the operator concerned before the RD blows off. ☐ It was observed that the Rupture Disc and SRV are provided in series on the auto claves basing on process reasons, though two pressure relieving devices are there, only the SRV is actually relieving the pressure of the auto clave in case of high pressure. Hence the functioning of the SRV is to be ensured periodically as there is no other redundant devise to safe guard the auto clave. ☐ Process flow diagrams, Critical parameters of Hydrogenation process and action to be taken in case of hydrogenation process emergency are to be displayed visibly at operators panel board. ☐ Ensure adequacy of firefighting equipment at Hydrogenation process unit	☐ All pressure gauges are calibrated yearly internally by Inst. Department with master equipment and SRVs are tested half yearly by a competent person as per AP Factories Rules. Calibration tags with test dates and due dates are affixed. ☐ All vents, including pressure relief device outlets are routed to safe locations in open air to prevent exposure to personnel and nearby structures ☐ SRVs and rupture discs are connected to a properly designed dump tank. The dump tank is provided with a vent line discharging to a safe location. ☐ We will review internally and if necessary we will provide transmitter with audio visual display. ☐ Periodic testing and inspection of SRVs are carried out to ensure proper functioning. ☐ Process Flow Diagrams (PFDs), critical operating parameters, and emergency response actions for the hydrogenation process are displayed prominently at the operator panel for easy reference. ☐ Adequate firefighting equipment is provided at the hydrogenation unit. Periodic inspection and maintenance of firefighting systems are ensured.

S.No	Observations	Compliance Status
14	Castor oil filters:	
	☐ Castor oil filters are seeming to be handling oil at temperatures about 80degC to 100 deg C, in case of any oil spills due to leak etc., the burn injury will be severe consider barricading the area and display caution regarding hot oil and use of suitable PPE and ☐ Also provide flange guards for hot oil pipe flanges. ☐ The bottom tray provided at one of the filters for collecting any leaked oil found totally corroded and oil gets spread over the floor in case of leak in to the tray, renew the tray. ☐ Provide insulation for hot oil piping to avoid any accidental contact. ☐ Unwanted material / equipment to be identified and removed from Hydrogenation and Castor Oil filters area.	☐ The area is barricaded. Persons are mandated to use appropriate PPE while working in the area. ☐ Flange guards are provided on all hot oil pipelines to prevent splash/burn injuries. ☐ Corroded bottom tray is replaced with a new. ☐ Left over all hot oil pipelines is properly insulated to prevent accidental contact and burn injuries. ☐ Unwanted materials are removed. The area is maintained clean.
15	Hydrogen Compressors and Hydrogen storage bullets section:	
	(At the time of audit, all the three compressors are not working due to planned shutdown. Audit carried out basing on the inter action with operating persons and site observation.) ☐ Hydrogen storage bullets area entrance to unauthorised persons is found restricted by providing a gate and is locked too. However, there is other side entry through compressor room, where there is no gate or door and people are found entering through it. In such case the provision of locked gate at one side is getting defeated. Consider restricting personnel entry through compressor room also by providing a door,	☐ Entry through the compressor room is restricted by providing a door. Unauthorized entry to the hydrogen storage area is fully controlled.

S.No	Observations	Compliance Status
	☐ Provide caution display such as Hydrogen storage and compressors area, unauthorised entry restricted Also provide caution such as No un authorised hot work, No smoking, No cell phone usage, No Plastic / Polythene usage, cautioning personnel not to enter wearing clothing which can generate static charges etc., ☐ One plastic chair was found inside compressor room, use of plastic material inside is to be restricted. ☐ Compressor and bullets area is found to be of cemented and hard flooring, which when metallic materials / equipment such as N2 cylinders are moved on it or when people are entering inside the area, their shoe soles may have stone pebbles or metal pieces stuck can cause friction and invisible sparking, which is enough to cause Hydrogen to catch fire in case of any leak there. Consider providing non sparking mastic floor or any provide with any other material which doesn't cause sparking. As to ignite a stoichiometric Hydrogen – Air mixture requires a Minimum Ignition Energy (MIE) of 0.02 milli Joules(mJ). This tiny amount of energy means nearly any spark or hot surface is an effective ignition source, ☐ In case of using rubber sheets for flooring ensure conductive rubber sheets are used, so as to ground the static charge of the moving personnel. ☐ While doing so also ensure perfect grounding of personnel moving or working at the area. ☐ Personnel Static charge grounding (dissipater) provided at the entry gate to bullets area, seem to be not working properly, it is to be checked periodically for its proper functioning. ☐ The personnel static charge dissipater is to be provided at entry through compressor's room also as the energy required to ignite Hydrogen is roughly ten times less than that for common hydrocarbon fuels. This energy level is so low that a static discharge from a human body, which is typically less than 1 mJ can easily ignite a wide range of flammable mixture (4% - 75% by volume) of Hydrogen.	☐ Appropriate caution boards such as "Hydrogen Storage Area – Unauthorized Entry Restricted" is provided at entry points. ☐ Plastic chair and any other plastic materials are removed from the compressor room. ☐ We have provided rubber mat to avoid any spark generation while carrying N2 cylinders and other metallic equipment. ☐ Where rubber sheets are used, conductive type rubber mats are provided to ensure dissipation of static charges. ☐ Proper grounding arrangements for personnel have been ensured. Static charge grounding practices have been implemented for all personnel entering the area. ☐ Human dissipater Static charge is provide at the entry gate is checked and repaired, and is now functioning properly. ☐ Persons are using the existing human dissipater at H2 Bullet area nearer to the compressor room.

S.No	Observations	Compliance Status
	☐ Intrinsic safe electric equipment / lighting has been provided at compressor room, ensure that the lighting and instrument equipment wires glands are not loose and gaps are there. (Ex: for PS 1761 cable gland came out.) ☐ Hydrogen leak detectors testing seem to be not done; detectors are having cobwebs. ☐ Except K 501 C, A & B compressors and connected piping and supports are getting corroded, needs painting. ☐ Compressors and connecting piping and supports are to be properly earthed, ensure continuity of earthing (for some piping flanges continuity bonding found missing) ☐ Hydrogen MSDS and Dos and Don'ts regarding Hydrogen handling is to be displayed visibly at work place. ☐ It is noted that Drawing office is located above the compressor room. Hydrogen gas if leaks go up and might enter in Drawing office and eventually cause fire incident as the lighting and other electrical equipment used in the office may not be of intrinsic safe (Ex: Air Conditioner etc.), Consider relocating the drawing office from Hydrogen handling / storage area. ☐ Compressor room sun shading found to be getting damaged, need repair. ☐ Lot of electrical cables are found laid on the sun shade haphazardly, any joints in the cables can cause hot spots, these cables are to be properly laid preferably through a conduit. ☐ Outside compressor room, castor oil loading platform railing is not good and once side railing is missing, it is to be rectified. ☐ By the side of platform drain is full with stagnated water and drain is not having any cover. Stagnated water is to be cleaned and drain to be covered.	☐ All intrinsically safe electrical equipment, lighting fixtures, and instrument wiring/glands are checked. Loose connections are rectified. ☐ All hydrogen leak detectors are cleaned, calibrated, and tested. Cobwebs and dust are removed. ☐ Corroded compressors (K-501 A, B, C) and associated piping/supports are de-rusted and painted with anti-corrosive paint. ☐ Proper earthing are ensured for compressors, piping, and supports. Missing bonding across flanges is provided and continuity of earthing is verified. ☐ Hydrogen MSDS and Dos and Don'ts are displayed. ☐ We will discuss internally with our concerned technical person and take appropriate decision. ☐ Damaged sunshade is repaired and strengthened to ensure structural safety. ☐ All electrical cables previously laid haphazardly are properly routed through trays. Loose joints and potential hotspots are eliminated. ☐ The damaged railing are replaced with new one to ensure complete fall protection. ☐ Stagnant water is cleared and the drain is covered with precast slabs to prevent slips.

S.No	Observations	Compliance Status
	☐ There is lot of vehicle / fork lift movement by the side of Hydrogen compressor room, ensure that the vehicles exhaust is provided with standard spark arrestors. ☐ At bullets area there are about 4 to 5 Hydrogen leak detectors are provided. However, all the detectors are fixed at one side only, in case the leak goes other sides due to wind direction or otherwise, leak may not be detected, provide leak detectors at other sides also; especially towards Fusion plant where there is furnace. ☐ For the SRVs on the bullets the discharge outlet height seems to be less, consider increasing the height so as to vent out any released Hydrogen due to popping / passing of SRV at a higher height for safe dispersal of gas. ☐ Bullet area sprinkler system checked and found to be good. ☐ Consider spark proof mastic or other flooring at bullet area also at the same time ensuring static charge grounding of personnel moving at the area i.e., in case of using rubber sheets use conductive rubber sheets.	☐ The forklifts operating near the hydrogen compressor area are now equipped with standard spark arrestors. ☐ The existing four H₂ gas detectors are positioned considering probable leak sources and hydrogen dispersion characteristics at the manifold area. ☐ Discharge outlets of SRVs on hydrogen bullets are extended to a higher elevation to ensure safe dispersion of released hydrogen gas. ☐ Sprinkler system has been inspected and confirmed to be in good working condition. ☐ Wherever movement is anticipated appropriate rubber mats are provided.
16	Hydrogen handling system (compressors, storage bullets and hydrogenation system) Pipelines and Vessels:	
	☐ Pipelines for hydrogen shall be clearly marked by means of colour coding and/or labels and flow direction are to be marked ☐ Mechanical integrity of Hydrogen piping and vessels handling Hydrogen and their support structure are to be checked periodically basing on the corrosion level and of Hydrogen embrittlement. ☐ Hydrogen has a very low molecular weight and high diffusivity making it prone to leaks hence mechanical integrity checks of the equipment and connected piping should be carried out more frequently.	☐ All hydrogen pipelines are clearly marked with color coding, labels, and flow direction indicators for easy identification. ☐ Periodic inspection is carried out for hydrogen pipelines, vessels, and support structures considering corrosion and Hydrogen embrittlement effects. ☐ Inspection of hydrogen is focused more considering hydrogen's high diffusivity and leak potential to ensure system integrity.

S.No	Observations	Compliance Status
	☐ For Hydrogen handling System consider carrying out HAZOP study referencing P&ID and actual site lay out to evaluate process hazards and operability and to comply with the recommendations accordingly. ☐ While doing HAZOP consider hazards those are likely to impact from the other areas of operations. ☐ Any modifications / changes in system are to be addressed under Management of Change and HAZOP to be carried prior to modification / change. ☐ The hydrogen pipeline should be run at a higher elevation than other pipelines. ☐ Ensure bonding of the piping flanges and good earthing of the piping system.	☐ HAZOP study is carried out based on P&ID and actual site layout. All most recommendations are implemented to enhance process safety. ☐ Interactions and potential hazards from nearby process areas are evaluated and addressed as part of the HAZOP study. ☐ A formal Management of Change system is implemented by PSM committee. All modifications are reviewed through MOC and HAZOP prior to execution. ☐ Hydrogen pipelines are routed at higher elevations compared to other pipelines to minimize risk. ☐ Proper earthing and bonding of hydrogen pipelines, including flange connections are ensured and verified for continuity.
17	Identification of and Access to Hazard Zones:	
	☐ The extent of the hazard zones is to be posted by permanent notices, particularly at access points, or by distinctive lines painted on the ground. Notices shall indicate the nature of the hazard, e.g. <i>HYDROGEN - FLAMMABLE GAS NO SMOKING - NO OPEN FLAME</i> ☐ Only authorised personnel shall be allowed to enter these zones. These personnel shall be aware of the hazards likely to be encountered and the relevant emergency procedures. Notice to that effect is to be posted as <i>NO UNAUTHORISED ENTRY</i> Personnel shall be instructed on the dangers of using unauthorised electrical equipment ☐ These instructions shall include advice on hazards, which may arise. Such instructions should be repeated at regular intervals. ☐ Ensure that only Flame / spark proof electrical fittings / lighting has been provided at Hydrogen handling zone. Also ensure that cable glands for the electrical boxes / lighting etc are totally tight fitted without gaps.	☐ Hazardous zones are displayed. Signages indicating “HYDROGEN – FLAMMABLE GAS / NO SMOKING / NO USE OF MOBILE PHONE” are also displayed at entry area. ☐ Entry into hydrogen hazard zones are restricted to unauthorized personnel only. “NO UNAUTHORIZED ENTRY” boards are displayed. All hydrogen handling personnel have been trained on associated hazards and emergency procedures. ☐ Detailed safety instructions covering hydrogen hazards and safe practices are displayed. Periodic training and awareness programs are conducted for all concerned personnel. ☐ We have provided flame proof electrical fittings and lighting within hydrogen handling zones. Cable glands and enclosures are properly tightened and sealed to eliminate any gaps.

S.No	Observations	Compliance Status
	☐ Strictly prohibit cell phone usage at Hydrogen handling area. Only use intrinsically safe phones for communication. ☐ Display caution regarding spark proof tools for maintenance activity. Also strict vigilance is required on maintenance activity carried out by regular maintenance personnel or contract work force regarding use of spark proof tools.	☐ Use of regular mobile phones is strictly prohibited in hydrogen handling areas. ☐ Caution boards regarding the use of spark-proof tools are displayed. Strict monitoring and supervision of maintenance activities are carried out to ensure compliance by both employees and contract workers.
18	Earthing & Static Charge Prevention:	
	☐ Equipment and systems shall be earthed and bonded to give protection against the hazards of stray electrical currents and static electricity. ☐ All systems shall be bonded, where necessary, and effectively earthed to give protection against the hazards of stray electrical currents, static electricity and lightning protection ☐ Floors, floor coverings, rubber mats, chairs, steps, etc. shall be of conductive material in order to achieve the electrostatic earthing of persons ☐ All persons working in hydrogen stations should wear conductive footwear. ☐ Care shall also be taken in the choice of material for working clothes since most synthetic materials readily generate static charges. Fire resistant clothing should be worn when working in classified areas.	☐ All equipment and systems are properly earthed and bonded to prevent hazards due to stray currents and static electricity. Continuity of earthing is verified. ☐ Effective earthing and bonding systems are in place to safeguard against static electricity and lightning hazards. ☐ Floors, rubber mats, platforms, chairs, and access equipment in hydrogen handling areas are made of conductive materials to ensure proper dissipation of static charges from personnel. ☐ Conductive footwear is used by persons working in the hydrogen station to avoid static discharge. ☐ Non static generating clothes are used to minimize static charge generation.
19	Sodium Hydroxide flakes loading:	
	1. Sodium Hydroxide flakes jumbo bags loading plat form, provide a step ladder for easy accessibility, in case of any caustic spill, which is of 98% concentration, person should come down easily. 2. Provide all the necessary PPE for carrying the activity. 3. There is no shower / eye washer near to the loading point. In case of spill on body / eye one has to run a distance for washing it and by the time he goes to the shower / eye washer he gets burns because of high concentration of caustic. 4. Provide caustic MSDS and dos and don'ts display in Telugu which is to be clearly visible.	1. A dedicated loading platform for sodium hydroxide is provided with ladder to ensure safe access of personnel 2. All personnel involved in the activity are provided with necessary PPE and are using suitable for handling of sodium hydroxide. 3. An emergency eyewash with shower set is provided near loading area to enable immediate de-contamination in case of exposure to high concentration caustic flakes. 4. MSDS along with Dos and Don'ts in Telugu is displayed.

S.No	Observations	Compliance Status
	5.Ensure the exhaust system is in good working condition to suck any Caustic dust emitted during activity.	5.The exhaust system is inspected and functioning effectively to control and remove caustic dust generated during the loading activity.
20	FIREFIGHTING DEPARTMENT:	
	1. Numbers of fire tenders are available with the department. 2. Fire NOC has been taken on dated: 21.09.2021 and is valid for five years. 3. Fire water pressure is being maintained at 7.0 kg / Cm 2 4. Diesel operated pumps are available for fire water in case of Power failure, which will be started manually when power fails. 5. No secondary containment provided for Diesel tank. Secondary containment (Bund wall or otherwise) is to be provided. 6. AFFF shelf life is not evident, ensure the shelf life. It is not good to keep AFFF exposed to sun as the properties of foam may deteriorate. (EX: Carbuoys are kept exposed to sun at 11 & 12 fire water monitors area). 7. At the 11 & 12 monitors and at some other areas scrap material and other waste found placed, this hampers the accessibility to monitors operation. All the firefighting equipment such as hydrants, monitors, CO2 or others shall place such that they are easily accessible. 8. Also, for some monitors the valve wheel is so fixed that for operating the wheel one has to go into a congested place. While fixing hydrants / monitors ergonomic study to be carried for ease of operation. 9. It was observed that two of the fire tenders became very old, recommended to replace with new fire tender with all facilities. 10.Recommended to provided tested tag to all fire extinguishers.	1. Three number of fire tenders are available with the department.. maintained at 7.0 kg / Cm 2 2. Fire NOC dated 21.09.2021has been obtained and is valid for five years.. 3. Fire water pressure is maintained at 7.0 kg / Cm 2 4. Diesel operated fire water pumps are available and are being operated during power failure. 5. Secondary containment (FRP tray) has been provided for diesel tank. 6. Self-life of AFFF has been verified and recorded.AFFF containers have been shifted to a storage area to avoid sunlight exposure. 7. Scrap materials and waste are cleared, ensuring unobstructed access to all fire monitors and hydrants. 8. Modifications are done for safe access to monitor valve wheels. 9. Old fire tender replaced with new multipurpose fire tender equipped with modern facilities. 10All fire extinguishers have been provided with updated test/inspection tags.

S.No	Observations	Compliance Status
	11. Fire hoses after usage shall be dried placing them on a slanted stand or ramp so as drain all the water. By the present practice of drying those keeping horizontally on floor may leave water traces inside hose and eventual pitting and causing holes in hoses.	11. Fire hoses are dried using a designated stand to ensure complete drainage of water
21	OCCUPATIONAL HEALTH CENTRE (OHC):	
	1. No Full-time medical Officer available in OHC. A qualified Medical officer MBBS with AIFH (Associate Fellow in Industrial Health) required in line up with Statutory requirements as said in Factories act 1948 Sec 10, 61(SC) B, AP of factory rules. 2. OHC is equipped with 8 beds and 5 nursing staff. Also 3 ambulances are available. 3. All Occupational health hazards are to be identified and annual tests to be conducted basing on these findings. 4. Recommending arranging some of the training sessions by doctor for all the workers regarding health hazards. 5. Doctor should be a member in Safety Committee and need to attend all the Safety Committee meetings to discuss any repeated First-aid cases or injuries 6. Material Safety Data Sheets (MSDS) of all the hazardous chemicals being used in the plant are to be made available at OHC so that Doctor can Know the health hazards of the chemicals and accordingly keep medicines and treat patients and even if the patient is sent to tie up hospital can provide the details to the Doctors there. 7. Annual medical checks are being carried for all the employees. Along with the existing medical checks consider adding Liver function test also. 8. First aiders list is not evident, consider providing first aid training to some of the employees taking employees from each plant / section and display the list of trained first aiders. (their names, section, employment number, contact number etc.,) 9. At Oxygen cylinders storage, (about 15 cylinders are found stored) display Oxygen cylinders handling precautions.	1. A full-time qualified Medical Officer (MBBS) has been appointed in compliance with statutory requirements under the Factories Act and AP Factory Rules. 2. OHC is equipped with 10 beds supported by 5 nursing staff, and 3 ambulances are available to handle medical emergencies effectively. 3. Occupational health hazards have been identified, and annual medical examinations are being conducted based on the identified risks. 4. Periodical training sessions on health hazards are being conducted by the Medical Officer for all employees. 5. The Medical Officer has been included as a member of the Safety Committee and is actively participating in meetings to discuss first aid case and injuries. 6. Material Safety Data Sheets (MSDS) for hazardous chemicals have been made available at the OHC for reference and effective medical treatment. 7. Annual medical examinations are being conducted for all employees & contract workers. Liver Function Test (LFT) has been included as part of the medical check-up those is working chlorine and dust exposure area. 8. Employees from all plants/sections have been trained in first aid. A list of trained first aiders (including name, department, employee number, and contact details) has been displayed at control room. 9. Safety and handling precautions for oxygen cylinders are displayed at OHC. Safe storage and handling practices are being followed.

S.No	Observations	Compliance Status
22	132 KV SWITCH YARD:	
	1. List of the authorised electrical persons shall be displayed at the entrance as per IE rules. 2. Gravels are to be provided as per IE rules. 3. Caution regarding entry of un authorised persons, dos and don'ts while working inside switch yard to be displayed at the entrance and entrance to un authorised personnel is to be controlled. 4. Persons who are working at battery room are not having awareness on hazards of the battery room and panels. 5. In the Wet battery room, exhaust is not evident, provide exhaust fans so to disperse any liberated Hydrogen.	1. List of authorized electrical personnel has been displayed at Electrical department as per IE Rules. 2. Required gravels are provided in the switchyard area as per safety standards. 3. Warning boards including "No Unauthorized Entry," Do's & Don'ts have been displayed. Entry is restricted to un authorized personnel only. 4. Personnel working in battery rooms have been trained on associated hazards and safe work practices. 5.Exhaust fans are installed in the wet battery room to safely disperse hydrogen gas.
23	RECTIFIER TRANSFORMERS:	
	1. For most of the transformer's silica gel is to be replaced it is getting exhausted and colour turning to pink. 2. Transformer below pit is having stagnated water, needs to be cleaned and pit properly covered. 3. 4 transformer area, cables on the cable tray are found tied with armoured wire, Armoured wire used for Cable dressing is not correct, it gets rusted in duecourse and may cut the insulation and cause unwanted incident. Pl uses AlClamp. 4. In case of transformer fire only 2 nos. Of 22.5 Kg CO 2 extinguishers are available, ensure adequacy of fire fighting equipment.	Rectifier Transformers: 1.Exhausted silica gel has been replaced in all transformers, and breather condition restored to ensure proper moisture control. 2. Stagnant water has been removed from transformer pits, and proper covers have been provided to prevent water accumulation. 3. Armored wire used for cable dressing has been removed. Proper cable clamps have been used to secure cables without damaging insulation. 4. Adequate firefighting equipment is provided, including additional CO₂ type fire extinguishers in addition to NIFPS(Nitrogen Injection Fire Protection System) has been installed for transformer fire scenarios.
24	CANTEEN:	
	1. Canteen up keep is good. 2. Canteen waste is found dumped outside the canteen openly, provide bins with cover for dumping the waste.	1. Good housekeeping is maintained in the canteen area. 2. Covered bins have been provided for proper disposal of canteen waste, and open dumping has been eliminated.

S.No	Observations	Compliance Status
25	MAIN STORES:	
	1. Storage racks load bearing capacity to be tested by authorised person and to be displayed on the racks. 2. For rejected material dedicated storage place shall be identified and rejected material shall be stored at locked area, so that rejected material is not being used by mistake, which eventually may become cause for some unwanted incident. 3. For the liquefied CO2 storage container, the due date of approval is displayed as 30.09.2025, no evidence of further approval. It is to be corrected in case approval is taken or otherwise approval is to be taken.	1. Storage racks have been tested by the supplier and load bearing capacity are verified. 2. An area is identified for rejected materials. The area is locked to prevent inadvertent use. 3. The license for the Liquid CO2 storage tank (License No. S/HO/AP/03/368) is renewed and is valid up to 30.09.2030. The relevant details are displayed at the site.
26	Laboratory:	Laboratory:
27	1. SOP on Safe handling of laboratory chemicals needs to be prepared & all the laboratory team needs to be trained on this SOP. 2. O2 analyzer is to be provided in the closed room where gases used for analysis. 3. Burette stands are getting damaged needs renewal.	1. SOP for safe handling of laboratory chemicals has been prepared and implemented. All laboratory personnel have been trained accordingly. 2. Oxygen is analyzed periodically with portable Oxygen detector in the closed room where gases are used for analysis to ensure safety. 3. Damaged burette stands are replaced with new ones to ensure safe laboratory operations.
28	Mechanical Department: 1. Consider recording every preventive maintenance test conducted by the department in hard copy for references. 2. Recommending conducting Illumination, Noise and Ventilation survey reports at necessary locations 3. All parts of the plant, equipment, machinery which in the likely event of failure may give to an emergency situation shall be examined by the competent person as per Rule-95, Schedule-XV under chemical works as per Factories Rules. 4. According to Rule-56 of Factories rules, all air receivers/pressure vessels must be Hydro tested once in every two years in presence of Competent person and is to be certified. 5. Recommending integrity checks for all pipe lines at regular intervals 6. Full Body harness and Life lines must be tested and certified by a competent person under Rule 61C of factories rules. 7. It is an important that usage of MEKP liquid for making FRP should take care on usage, storage and transportation. Civil Department: 1. It was observed that some of the process and utility buildings and structures are seems to be getting corroded.	Mechanical Department: 1. A system has been implemented to record all preventive maintenance activities in hard copy for reference. Additionally, an experienced consultant has been engaged on a regular basis to exclusively verify the PM activities 2. Illumination and noise surveys are conducted periodically at required locations, and records are maintained. 3. All critical plant equipment and machinery, which may lead to emergency situations upon failure, are being examined by M/s Lumen Engineering Associates, Visakhapatnam as per Rule 95, Schedule XV of Factories Rules. 4. All air receivers and pressure vessels have been hydrostatically tested by M/s SG Testing, Hyderabad through a 3rdparty agency and certified as per Rule 56 of Factories Rules. 5. Integrity checks of H2 & Cl2 pipelines are carried out periodically and records are maintained by mechanical department. 6. Full body harness are replaced every six months and are periodically inspected by Safety Department and records are maintained.

S.No	Observations	Compliance Status
29	2. As per Building Regulations Act 1989, buildings below 15 years of age, need to obtain Stability Certificate once in every 5 years and if the buildings are above 15 years of age need to obtain Stability Certificate once in every 3 years, So Consider conducting Structural Stability tests for buildings accordingly by a Factories department approved competent person. 3. It is important that scaffolding which is using at present at most of the places is fully non-standard. it is to be taken care that standard scaffolding materials are to be used. Electrical Department: 1. Earth leak mats and HT hand gloves should be tested for potentiality for every one year according to IS-4770. 2. Qualified Electrical Safety Officer to be designated and ratified by CIG. 3. All license holders' names with contact numbers to be displayed in MCC rooms. 4. Consider providing Firefighting system for the Transformer like increasing Fire extinguishers and sand buckets which could lend a hand in emergencies. 5. Instruments like Multi meter, Megger etc., must be calibrated and recorded.	7. Safe procedures for storage, handling, and transportation of MEKP have been established and implemented. Civil Department: 1. Corroded process and utility structures are identified, repaired, and protected with suitable anti-corrosive coatings. The work is carried out by specialized personnel from Asian Paints. 2. Structural stability assessments is carried for all buildings by A. R. Industrial Services, Guntur and recommendations are implemented.. Electrical Department: 1. Insulated rubber mats and HT hand gloves have been tested by supplier. 1. A qualified Electrical Engineer has been deployed in the Safety Department under the supervision of a competent and ratified Safety Officer for monitoring all electrical safety activities. 2. Names and contact numbers of all authorized electrical license holders have been displayed in MCC room. 3. Additional firefighting equipment, including fire extinguishers and sand buckets is provided near transformers. 4. All instruments such as multimeters, meggers, etc., have been calibrated and records are maintained. Road Safety: 1. Road safety signboards, including speed limit boards are displayed at the factory site. 2. Zebra crossings and pedestrian walkways have been marked at all critical intersections. 3. Speed breakers have been installed at critical turns and pedestrian crossing areas. 4. Convex mirrors are installed at blind corners to improve visibility and prevent accidents.
30	Road Safety: 1. Recommending pasting of Inspiring Road Safety Signage's with Speed limit boards at entrance of the factory 2. Road crossing systems like Zebra crossing system, pedestrian walk ways to be implemented at all intersections 3. Speed control bumps/speed breakers needs to be places at critical turnings & People crossings. 4. Convex mirrors at blind corners needs to be placed. 5. Pedestrian walkways are to be marked clearly and caution to pedestrians to be displayed regarding usage of pedestrian path, especially from main gate entry to administration block / inside plant, stores area and other areas where vehicle and pedestrian movement is there. 6. Display caution at main gate cautioning two-wheeler raiders entering the plant on "WEARING OF CRASH HELMETS"	

S.No	Observations	Compliance Status
31	Safety Department: 1. It is noted that announced mock drills are being conducted periodically as per statutory requirement of once in six months. Consider doing unannounced mock drill and mock drill in evening / night shift or on holidays. 2. assembling points are identified in case of any on site emergency, review the Onsite emergency plan and consider providing one or two more assembling points as the distance to assembling points to some plants areas seem to be more. 3. For the assembling point # 1 at administration building, it was observed that the area is getting blocked with cars parking; consider moving the point to opposite park area by providing suitable approach to the area as it is at a little height. 4. Emergency Control Centre should be located with all required items as specified in factories rules. 5. Consider providing static discharge pads at all production blocks entrances, solvent storage tank forms and also at Laboratory as hydrogen is being used. 6. Doctor (head nurse until regular Doctor is appointed), should be added as a member in Safety committee meeting. 7. Along with the existing Work permits like hot work; work at heights, confined space, Electrical works, consider implementing permit for vessel / pipeline opening also. As at times pipeline / vessel opening may cause incidents due to locked up pressures / locked up hazardous chemicals / dust etc., 8. Site evacuation root plans along with Assembly point locations needs to be displayed at various locations in the plant. 9. Way to Assembly point and Assembly point markings to be displayed. 10. Existing assembly points is to be relocated, because it is on the road. 11. Consider implementing Process Safety Management system for all process related activity.	5. Pedestrian pathways have been clearly marked to ensure safe movement of pedestrians. 6. Safety signage mandating the use of crash helmets for two-wheeler riders is displayed at the main gate. Safety Department: 1. In addition to scheduled mock drills, mock drills are conducted during evening/night shifts and holidays to improve emergency preparedness. 2. Onsite Emergency Plan is periodically reviewed and updated. The last review of OSEP was carried out on 24.12.024. 3. Assembly Point: 1 is relocated to the ADM building opposite garden area. 4. Emergency Control Centre are equipped with all required equipment as per Factories Rules. 5. Provided 6. Medical Officer is included as a member in the Safety Committee and is participating in meetings. 7. Permit-to-Work system is strictly followed for all non-routine jobs and necessary control measures are implemented. 8. Block wise evacuation routes and assembly point layouts are displayed at prominent locations across the plant. 9. Way to assembly points is marked in the factory premises. 10. Existing assembly points are relocated to safer places. 11. Process Safety Management (PSM) system is implemented for all process-related activities and reviewed in monthly Apex Committee. 12. PSSR procedure is implemented for all new processes. Checklists are in place and followed. 13. MOC system has been implemented. All changes are evaluated through HAZOP (for process hazards) and HIRA (for general activities) before execution.

S.No	Observations	Compliance Status
	12. Before starting of any new equipment / process or activity or starting a unit / process after longer shut down, consider implementing Pre-Start Up Safety Review (PSSR) by preparing suitable checklists. 13. For any modifications or changes in the plant / process consider implementing Management of Change (MOC) and carry out hazard analysis by doing HAZOP for evaluating Process Hazards and HIRA for all general activities. 14. Consider evaluating ergonomically hazards also in general activities. 15. Recommending Vertical Life line with Fall arrestor system for all vertical ladders especially at tall structures such as chimneys, cooling tower cat ladders etc., 16. Recommending Hazardous area classification (HAC) study for entire plant as many haz chemicals are being used. 17. Emergency Siren codes to be displayed at Siren location and other important locations of the plant and also this siren codes to be displayed at security. 18. Recommending improving Personal Protective Equipment usage in the plant. 19. For the chemical cartridge respirators expiry to be marked and the duration of usage is to be noted. 20. About the usage of chemical cartridge respirator personnel using them are not aware of how to test whether they have fully tightened the face mask or not, further training is to be imparted. 21. SCBA set face masks are to be properly kept, many areas they are found to have dust, At power plant area they kept them neatly. Similar way other areas can also follow. 22. Also, SCBA sets can be kept at a convenient height so that persons can wear them easily and quickly during emergency. 23. As there are modifications in the plant On-Site Emergency Response Plan is to be updated by considering all emergencies and provide training for all the plant personal. So also Safety Report is to be revised	14. Ergonomically hazard assessments are to be carried out. 15. Vertical lifelines with fall arrestor systems have been installed at loading/Unloading areas and critical locations. 16. Hazardous Area Classification study is carried out by Safety Department and the same is displayed. 17. Emergency siren codes are displayed at prominent areas across the plant for easy reference. 18. PPE compliance has been strengthened through awareness programs, supervision, and enforcement. Personnel are consistently using appropriate PPE. 19. Expiry dates of chemical cartridges have been marked, and replaced half yearly with new ones. 20. Training is provided to personnel on proper wearing for chemical cartridge respirators. 21. All SCBA face masks are cleaned and maintained free from dust and kept in the SCBA Box. 22. SCBA sets are kept at convenient heights and accessible locations to enable quick use during emergencies. 23. On-Site Emergency Plan is updated considering plant modifications. Safety Report is also revised and training provided to all employees. 24. QESH policy is displayed at prominent locations of all plants and. Training has been conducted to ensure employees understand policy commitments, roles, and responsibilities. Security: 1. Traffic management plan has been implemented for incoming and outgoing trucks/tankers to ensure safe and controlled movement at entry gates.

S.No	Observations	Compliance Status
32	24. OHS policy is clubbed with Quality and Environment as QESH policy (signed on 01.12.2021, by Executive Director, technical and also is occupier,) the policy is to be displayed at all plants and prominent places and workmen training is to be covered on policy points and their roles responsibilities in the implementation of policy. Security: 1. Lot of incoming and outgoing truck tanker movement is there for the transportation of materials at entry gates. The truck tanker movement is to be controlled by drawing a suitable plan for the incoming and outgoing trucks. 2. Regular security checks are being carried at the gate for personnel and vehicles entering the plant, the checks shall be more thorough as sabotage and terrorist activities can cause catastrophic situation in a hazardous chemicals handling plant. Arrange to Check the vehicles underneath by probing with mirrors and check for possible flammable materials / detonators etc. 3. Emergency Escape layout of entire plant should also be displayed at gate. 4. Emergency Response team and Action plan also to be displayed at security. 5. In the Safety Induction presentation to all visitors consider including what are the Hazardous chemicals used in the plant and primary care to be taken in case of exposure. 6. Emergency Siren Codes to be displayed at gate. 7. Currently to know the Head count of personnel present inside the plant it is taking about 1/ 2 an hour time for the security, consider implementing a suitable system for giving the head count in real time. 8. Consider taking Roll call of personnel present at each assembly point in case of emergencies or during emergency mock drills.	2. Security checks at entry points have been strengthened. Thorough inspection procedures for personnel and vehicles have been implemented to mitigate risks of sabotage and unauthorized access. 3. Emergency escape layout of the entire plant has is displayed at the 2nd gate garden area. 4. Emergency response team details is displayed at the security office notice board. 5. A safety induction video is shown to all visitors in the visitor room located at Security Gate No.2 to create awareness on safety practices and emergency procedures. 5. Emergency siren codes is displayed at the security main gate. 7. Suitable system has been implemented to provide real-time headcount of personnel inside the plant for emergency situations. 8. Headcount is conducted by the time office in co-ordination with security personnel at Assembly point. The headcount is verified and tallied with Time Office attendance. Search operation is carried out in case of shortfall.

S.No	Observations	Compliance Status
33	GENERAL OBSERVATIONS AT OTHER AREAS: 1. Though caution regarding cell phone usage is displayed at high hazardous areas such as Hydrogen storage and handling, Chlorine plant and at storage of flammable chemicals such as Methanol storage etc., no control is evidenced. Consider keeping guarding at such areas and when persons are entering the area the cell phones are to be handed to the guard. For workmen who need to communicate intrinsic safe communication phones (such as ATEX or IECEx) are to be used. 2. Consider installing Earth-leakage circuit breaker (ELCB) or Residual Current Circuit Breaker (RCCB) in high Earth impedance electrical installations to prevent shock. It detects small stray voltages on the metal enclosures of electrical equipment, and interrupts the circuit if a dangerous voltage is detected. 3. It was observed that for earthing (grounding) of vessels / equipment strips are being used and in case of usage of more strips they are welded / brazed at joints, these weld joints over a period gets failed causing failure of earthing, periodical survey for the continuity of grounding from equipment to earth pit is to be ensured and recorded. 4. For almost all the chemical storage tanks in the plant, working platform on the tank roof top is not evident. Work men seem to be standing directly on the roof top for carrying out any work, this practice is unsafe. Provide working platform on tank tops. 5. For most of the piping flanges carrying hazardous chemicals such as strong acids, alkalis etc., flange guards are not evident. As at many times flange gaskets are prone to leak, provide flange guarding to prevent chemical leak / splash on persons working at nearby area. 6. For the chemical storage tanks display clearly the name of the content in the tank, tank capacity and important chemical properties of the Chemical and the PPE required at the area. Labeling is very important in chemical storages and chemical plants as wrong labeling or no labeling may cause unwanted incidents.	General observations at other areas: 1. Strict control measures have been implemented at hazardous area. Personnel deposit mobile phones at security guard post before entering hazardous area such as methanol storage tank area and hydrogen bullet area. 2. Earth Leakage Circuit Breakers (ELCB) protection is provided for all Lighting Distribution Boards (DBs) and welding DBs across the plant to ensure electrical safety and protection against earth leakage faults.. 3. Earthing systems are reviewed. Welded/brazed joints are rectified and proper continuous earthing conductors have been ensured. Periodic inspection and testing of earthing continuity is implemented and records are maintained. 4. Safe working platforms with access arrangements have been provided on chemical storage tank rooftops. Left over walkway platform work in progress Unsafe practices of standing directly on tank roofs is prohibited. 5. Flange guards are provided on all pipelines carrying hazardous chemicals such as acids and alkalis to prevent splashes and leaks. 6. All chemical tanks are clearly labeled with the name of the contents, capacity, NFPA symbols and required PPE used in the area 7. MSDS and Do's & Don'ts board is repositioned to ensure clear visibility. Obstructions have been removed. 8. MSDS and safety instructions are displayed in Telugu in addition to English. 9. Periodic assessment of employee awareness on MSDS is implemented. Refresher training programs are conducted based on training evaluation results.

S.No	Observations	Compliance Status
	7. Though MSDS / Dos & Don'ts are displayed on walls or boards, the displays are found to be covered by material storages etc., The display is to be clearly visible to all the workmen working at that area. 8. Also, MSDS or Dos & Don'ts is also to be displayed in local language Telugu for the benefit of those who doesn't know English. 9. Awareness on the MSDS of the chemicals being handled by the workmen is to be tested periodically and if required they are to be trained about the chemical properties. 10. Presently though, the training programs are being conducted but there seems to be no training calendar prepared. training calendar basing on competence evaluation and training needs requirements as per annual appraisal system and accordingly prepare training schedules. Training programs to include safety related topics such as work permit system, emergency response, hazard identification and control, Material safety data sheets, legal requirements etc., Training programs to include video shows / clippings on safety and environment. Also include the topic on behavior-based safety. 11. Consider arranging specialized training program on static electricity and its hazards and controls. 12. Also training programs / pep talks to contract employees are to be conducted. 13. A multi-functional team may be constituted and a thorough inspection of each department may be carried out by setting a periodical inspection schedule. The inspection to focus on 1.) Process safety, such as possible process hazards, material compatibilities during storage and handling, functioning of trips and by passes, alarms, pressure relief systems 2.) Electrical safety such as defective electrical equipment,	10. A half yearly training calendar is developed based on competency evaluation and training needs. Training programs include safety topics such as permit-to-work system, emergency response, hazard identification, MSDS, and statutory requirements. Audio-visual training methods are also incorporated. 11. Specialized training program on static electricity, associated hazards, and control measures is conducted for relevant employees. 12. Toolbox talks are conducted for contract workers to enhance awareness and compliance by safety department personnel. 13. A multi-functional inspection team has been constituted. Periodic inspection schedules are implemented covering process safety, electrical safety, structural safety, mechanical safety, and general safety aspects. Observations are tracked and closed systematically. 14. Lists of first aiders, rescue team members, emergency response team members, and key personnel with contact details have been displayed at control rooms. 15. Adequate safety measure is implemented at the lift exit facing the road, by controlling pedestrian pathway to prevent direct exposure to vehicular movement at ADM Building. 16. HAZCHEM boards of standard size is provided at cylinder storage areas.

S.No	Observations	Compliance Status
	cabling, condition of panels, switch yard, intrinsic safe electrical system, earth pits, probable static charges and their grounding etc., 3.) Structural safety such as condition of buildings, roof structures, slabs provided on drains, stair cases, walk way platforms and their supports etc., 4.) Mechanical safety such as equipment condition and base supports, tools and tackles, pressure vessels / pressure pots, guarding of equipment etc., and 5. On general safety, such as housekeeping etc., 14. List of first aid trained personnel, Rescue team members, Emergency response team members, Names and contact numbers of key personnel shall be displayed at plant control rooms or at prominent places. 15. At administration block Personnel lift door opening at ground floor is facing towards the road, personnel are directly entering the road once they come out of the lift, with a probable risk of a person being hit by moving vehicles on the road. Hence, it is advised to provide a bull guard in front of the lift gate at the ground floor to restrict person entering on to the road directly from the lift. 16. Number of gas cylinders are found kept in cylinders bay without any HAZCHEM information. HAZCHEM information shall be displayed in a standard size of 600 mm x 450 mm (recommended for 10-15m viewing) refer IS 9457: 2005 - Safety colours and safety signs - Code of practice. 17. For the piping laid on the pipe tracks (bridges) colour coding is not evident any area in the plant, colour coding is to be displayed at strategic areas. 18. Duly Signed Safety Policy (QESH policy) with signed Date from occupier should be displayed at entrance of the plant and at prominent places such as canteen administration block, control rooms of plant etc.,	17. Color coding and flow direction markings are provided on all pipelines at strategic locations across the plant for easy identification. 18. Duly signed QESH policy with date from the occupier is displayed at the main entrance and all prominent locations to ensure awareness among all employees.