

THIRD PARTY EXTERNAL SAFETY AUDIT REPORT

COROMANDEL INTERNATIONAL LIMITED

BEACH ROAD, KAKINADA
Kakinada - 533 033
Andhra Pradesh



Audit Dates: 28th February, 2023 - 2nd March 2023

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We, IRCLASS Systems and Solutions Private Limited are obliged to the Management representative and Employees of Coromandel International Limited, Kakinada for their co-operation and support to IRCLASS Systems and Solutions Private Limited auditors during the Third Party External Safety Audit.

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1. PREAMBLE

1.1 INTRODUCTION:

This report presents the findings and recommendations of the Third Party External Safety Audit carried out at **Coromandel International Limited, Kakinada Fertilizer Unit, AP** between 28th February, 2023 to 02nd March, 2023 by IRCLASS Systems and Solutions Pvt. Ltd. (ISSPL).

The objectives of this audit were to verify the Health & Safety (H & S) systems prevalent in the **Coromandel International Limited, Kakinada** and to identify potential H & S hazards and suggest corrective actions, wherever necessary.

The information presented in the report is based on perusal of various documents and internal records pertaining to H & S, a sample inspection of the **Coromandel International Limited, Kakinada**, associated Technical building and discussions held with various personnel deputed. The recommendations made herein in the report, are based on the conditions and systems prevalent in the plant and hence applicable only to the said locations or mentioned otherwise. Due care has been exercised while framing the recommendations to make them simple, practical, feasible and thereby workable.

1.2 SCOPE:

The Third-Party External Safety Audit has been carried out with reference to BIS 14489 – ‘Code of Practice on Occupational Safety and Health Audit’ as well as Rule 10 of Manufacture, Storage and Import of Hazardous Chemicals (MSIHC) Rules. The prepared checklist used is also attached filled as Annexure A. The Indian Standard: 14489 has been broadly applied in conducting this audit. As stated in the Purchase Order, the approach and methodology of Third-Party External Safety Audit is to ensure compliance and fulfil the statutory requirements.

The main areas covered in the Third-Party External Safety Audit are as under:

- Health and Safety (H&S) management
- Operation & maintenance safety
- Fire prevention and protection
- Electrical & Instrumentation safety
- Emergency planning and preparedness
- Other physical hazards and control

1.3 OBJECTIVES:

The main objectives of the audit were to particularly examine Health and Safety (H & S) systems prevalent in all operations and processes of the fertilizer plant including associated departments such as Fire and Safety, Operations, Maintenance, Occupational health, Commercial, Purchase and Distribution etc., identify the potential H & S hazards and suggest corrective actions, wherever necessary.

The focus areas were as follows:

- Examine the existing operating/maintenance and other work practices, safety systems, fire protection facilities and control measures that might have degraded over the time.
- Identify potential Health & Safety (H&S) hazards not covered by the existing control procedures.
- Recommend improvements for better effectiveness of the existing procedures, systems and control measures for H & S hazards.
- Recommend procedures, systems and control measures for the hazards identified.
- Study compliance with critical statutory provisions and relevant codes of practice and recommend actions to be taken wherever there is non-compliance.

1.4 METHODOLOGY:

- Study and analyse preliminary information provided by the representatives of **Coromandel International Limited, Kakinada**
- Conduct an Opening Meeting with concerned officials of the **Coromandel International Limited, Kakinada**
- Carry out sample inspection of the processes and infrastructure within the facility.
- Discuss with key personnel of various departments as required, to understand the perceptions and views, suggestions or to verify existence of the systems/procedures.
- Study relevant documents and records.
- Conduct a 'Closing Meeting' with the senior personnel of **Coromandel International Limited, Kakinada** to present important observations and recommendations.
- Submission of the draft report to concern HSE official of **Coromandel International Limited, Kakinada** to filter out any factual errors/discrepancies in its content.
- Submission of the Final Third-Party External Safety Audit Report incorporating comments.

1.5 OPENING MEETING:

As informed by IRCLASS Systems and Solutions Pvt. Ltd, **Coromandel International Limited, Kakinada** representative arranged an opening meeting on 28th February, 2023 at 10:00 AM at their Conference Room in the Administrative Building. The meeting was attended by Unit Head (Sr. Associate

VP) HOD (Production), GM (Ops), AGM (QA), AGM (Instrument), HOD (Bagging), DGM (EHS), AGM (Projects), DGM (Maintenance), FMO, Manager (Environment), Sr. Manager (Electrical) DM (EHS) & AM (EHS).

During the meeting, the methodology of conducting the audit was explained to the participants. The Audit Team Leader highlighted the following items:

- The Third-Party External Safety Audit is being conducted as initiated by the Management of the **Coromandel International Limited, Kakinada**. Hence the need of the involvement and co-operation of the process owners is very essential and important in carrying out the Third-Party External Safety Audit successfully.
- The Third-Party External Safety Audit is a sample inspection of the workplace and processes as well as the study of key documents and records. The scope of the Third-Party External Safety Audit will be limited to the field visit of areas as planned and made available by **Coromandel International Ltd., Kakinada** for inspection, information provided to the auditors and documents & records produced for verification.
- The Third-Party External Safety Audit is a fact-finding exercise and aims at identification of areas for improvement in the safety performance based on observations, discussions at various levels and reference to the records & documents made available for verification. The Third-Party External Safety Audit report would be a confidential document.

1.6 FIELD INSPECTIONS:

The field inspections were undertaken with a view of focusing on key areas of Safety. In order to help maintaining uniformity and speeding up collection of information, inspections were facilitated by using a pre-designed checklist covering various elements of BIS 14489 and related standards.

Inspections/Audits were carried out in presence of the Fire & Safety personnel associated with the respective departments.

1.7 DISCUSSIONS:

Information was also gathered through discussions with the **Coromandel International Ltd., Kakinada** personnel at various levels from respective disciplines such as Fire and Safety, HR, Operation, Instrumentation, Maintenance, Electrical and other departments. The auditors also interacted with the personnel involved in the Operations, Maintenance, Occupational health, Commercial, Purchase and Distribution etc.

1.8 STUDY OF DOCUMENTS

In order to check and assess the status of the H&S Management System prevalent in the facility, many documents such as safety policy, safety manuals, safe work procedures, work permit system, operating & maintenance procedures, inspection schedules & reports, previous Third Party External Safety Audit reports, calibration reports, records of testing of critical equipment, Earthing systems, fire extinguishers, etc. were perused.

1.9 CONCLUDING MEETING:

The closing meeting was held on 2nd March 2023 at 4.40 PM in the Main Administration Building. The meeting was attended by Unit Head (Sr. Associate V.P), Sr. GM (OPs), HOD (Production), GM (Ops), AGM (QA), AGM (Instrument), HOD (Bagging), AGM (Projects), DGM (Maintenance), Sr. Manager (Electrical), Manager (EHS), DM (EHS), DM (QA) & AM (EHS). The Audit Team Leader, supported by other members, made a presentation and briefly narrated the key findings of the audit along with the proposed recommendations.

1.10 BRIEF DESCRIPTION OF COROMANDAL INTERNATIONAL KAKINADA

Coromandel International Limited, Kakinada is an ISO 9001, 14001, 45001 certified organisations is an important contributor to Country's Fertilizer demand of various grades of NPK fertilizers.

Coromandel International Ltd (Coromandel), Kakinada, a Murugappa Group of Company is a Fertilizer manufacturing plant. It is located at Kakinada.

This being a Chemical Process Industry and covered under the provisions of Factories Act, 1948 and Environment (Protection) Act, 1986 and Manufacture, storage and Import of Hazardous Chemicals rules 1989.

The plant is located 5 Km north-east of Kakinada and connected to the areas by road and rail.

The Plant is located at 17 degree N latitude and 82 degrees E longitude. The site faces the sea on east, 500 meters away from high tide line.

The on-site activities are primarily concerned with the production of N-P-K complex fertilizers of various grades under the trade name Gromor.

Di-ammonium Phosphate and other complex fertilizers are manufactured using raw materials such as Ammonia, Phosphoric Acid and Sulphuric Acid. These raw materials are received by ships and unloaded at Deep water port. Natural gas is being used for steam generation and as a heating media at DAP Plant.

The Process involves neutralization of Anhydrous Ammonia with Phosphoric Acid, Sulphuric acid to form Di-ammonium Phosphate and other complex fertilizers.

Following are the operating units at the Coromandel complex.

S. No.	Plant	Capacity
1.	DAP Plant A, B & C Trains	20.5 LMTPA
2.	Atmospheric Ammonia Storage Tanks	32500 MT
3.	Sulphuric Acid Tanks	14600 MT
4.	Phosphoric Acid Tanks	84000 MT
5.	Gas Fired Boiler	1 x 7 TPH & 1 x 12 TPH

PROCESS DESCRIPTION:

1.1.1. *Process Description of Existing Products (NP/NPK/DAP PLANT)*

The main raw materials used for manufacturing NP/NPK/DAP fertilizers are phosphoric Acid (54% P_2O_5 , Ammonia, Urea, Sulphuric Acid, Zinc oxide, River sand/ Dolomite (as Filler). In addition to the above, Muriate of Potash is used as additional raw material for the manufacturing of NPK Complex fertilizer.

The facility comprises three identical manufacturing trains namely A, B, and C. The fertilizer manufacturing process consists of a pre-neutralizer and a pipe reactor in which ammonia and phosphoric acid react to form Mono Ammonium Phosphate (MAP) and further reacts with ammonia to form Di Ammonium Phosphate (DAP). The DAP which is further sprayed on urea prills and Muriate of potash to form NPK fertilizer in a granulator. The product from the granulator will be dried and coated as required. The detailed manufacturing process is explained below:

A. PRE-NEUTRALIZER PROCESS

1. Making NPK Fertilizers with mixed PN & PR Process

All necessary slurry of ammonium sulphate and part of ammonium phosphate slurry is being made in PN, and the rest of ammonium phosphate slurry is made in PR. About 50-60% of the total slurry of ammonium sulphate and ammonium phosphate slurry is made in PN.

The PN is fed with Phosphoric Acid, Sulphuric Acid, acid liquor from scrubbing systems, water, liquid ammonia, and gas ammonia from ammonia separator to prepare the slurry. Liquid or gas ammonia is fed from the bottom of the PN through a series of nozzles (4 for liquid and 4 for gas) located all along the circumference, to obtain the best reaction efficiency. The PN is provided with an agitator to improve the reaction process and to obtain a homogenous slurry.

2. Phosphoric Acid feed to Process

About 25% of the total required Phosphoric Acid along with water is fed to SET (scrubber effluent tank) to obtain 23 % P_2O_5 and Sp. Gr. 1.30 in scrubber liquor. The scrubber liquor goes to pre-scrubber where 70% of the total Phosphoric Acid required is fed to the system. Pre-scrubber specific gravity, mole ratio, and $P_2O_5\%$ are maintained at 1.46, 0.45, and 42% respectively for NP manufacturing. From pre-scrubber, some part of the acid goes to PN and some part to PR feed tank in addition to scrubber liquor. 5% of the total required Phosphoric Acid is fed in the pipe reactor feed tank. The temperature in PN is usually 110-120°C in case of making ammonium phosphate slurry and 106-110°C in case of making ammonium phosphate sulphate slurry. The slurry from PN is then pumped to the granulator. There are two independent slurry transfer lines, each one connected to one of the pumps. Each line is provided with set of flow meters of magnetic type with the control valve.

B. PIPE REACTOR PROCESS

1. Reactions in the Pipe Reactors

Ammonia, phosphoric acid having 54% P_2O_5 along with recycled scrubber liquor, and sulfuric acid are reacted in the PR in definite proportions depending upon the grade. The ammonium phosphate slurry produced is pumped to the granulator for further granulation. The fumes generated are passed through the scrubbing system for recovery of ammonia.

2. Pipe Reactor

Two pipe reactors, installed behind the granulator to feed ammonia, phosphoric acid, and sulfuric acid. All the above are mixed and reacted in the mixing tee unit of the PR. The slurry so formed in the pipe reactor is pumped through a venturi to the granulator. The heat of reaction generated in the process is used to evaporate a part of dilution water contained in the phosphoric acid and that in recycled scrubber liquor. The phosphoric acid dilution is adjusted by controlling the scrubber liquor to get the required phosphate content at the outlet of the pipe reactor. The ammonium phosphate slurry that has formed in the pipe reactors goes into the granulator for further granulation. The fumes generated are passed through a scrubbing system for recovery of ammonia.

3. Reactions in the Granulator

Ammonium phosphate slurry produced from the PR is sprayed on to the recycle material bed in the granulator. The recycle material bed is formed in the granulator out of the granulator/ fine material that recycled from the dry section equipment as recycle material to ensure designed moisture for effective granulation. Supplementary liquid ammonia is sparged into the granulator, beneath the rolling bed of solid materials to adjust mole ratio to the value required by the formulation i.e. between 1.6-1.8. The efficiency of the reaction, taking place in this unit is very high because of the PR process adopted in the granulator. The unfixed Ammonia in the granulator is recovered in the gas scrubbing system.

4. Drying of the Product

The product formed in the granulator is routed to the drying unit, where the drying is accomplished in a rotary co-current hot gas dryer. This unit is designed to produce hot gas by burning Natural Gas. The dryer is fitted with chains and knockers to reduce scaling.

5. Screening and Pulverization of the Product

The dried product is sent for screening. The screening is established by using two sets of screens viz. scalping screens and product screens to efficiently segregate the material into oversize, fines, and product size. The oversize is pulverized in the oversize pulverizer and then recycled. The fines join the recycling system directly. The product that is drawn out is measured by product weigh scale fitted on the product conveyor and it is controlled through controlling the material feeding to product screens through variable speed conveyors.

6. Product Cooling

The product is air-cooled in a counter-current cooler using ambient air to the degree as required for the stability of the hygroscopic fertilizer material. The cooled product then goes to the storage area through product conveyor.

SCRUBBING SYSTEM IN NPK PLANT

During the manufacturing Process of NP/NPK fertilizers, the main pollutants that are releasing to the atmosphere are Ammonia, Dust, and Fluoride. The main nutrients that are escaping during the manufacturing process are un-reacted ammonia & fertilizer dust and are required to be recovered for the plant economy as well as for protecting the environment. To recover these materials scrubbing systems are provided in the plant that consists of cyclones, venturi, cyclonic wet scrubbers, dust scrubber, and final tail gas scrubber.

- 1. Pre-scrubber:** The first scrubbing unit is the pre-scrubber, where the ammonia gases & dust coming from granulators are scrubbed. It is a vertical cyclone type scrubber. The washing liquid is normally diluted with Phosphoric Acid containing 40% P₂O₅ and some Sulfuric Acid. A considerable part of the Phosphoric Acid is fed to the pre-scrubber, where it mixes with liquid coming from the scrubber effluent tank containing more diluted Phosphoric Acid. The escaped ammonia from the granulator reacts with acid-producing MAP and ammonium sulphate so that the mole ratio N/P in this liquid is maintained at about 0.4 to 0.6. The addition of a variable quantity of Sulfuric Acid can help to control the N/P ratio and solubility. The pre-scrubber consists of two sections. The first section is a throat type venturi. The pressure drop across the venturi will be about 100-150mm water column, at which the medium and larger size dust particles can be effectively captured. The venturi bottom plates maintain a turbulent pool of scrubbing liquid for erosion protection and gravity drain to the sumps ahead of the gas inlet of the cyclonic scrubber. The second section is composed of two sprays in the

horizontal arm followed by cyclonic sections, which serve to retain the liquid droplets carried from the venturi arm washing units.

2. **Fumes Scrubber:** Escaped gases from pre-scrubber are then sucked to the fumes scrubber where diluted Phosphoric Acid is sprayed through nozzles as a scrubbing medium to absorb unreacted ammonia.
3. **Cooler Scrubber:** The generated gases from the cooler unit consist of fine fertilizer dust which is passed through cooler cyclones where the fine dust particles are separated. Then the escaped gas from cooler cyclones consisting of fine dust is passed through cooler wet scrubber where scrubber liquor is used as a scrubbing medium to capture fine dust particles.
4. **Duct Scrubber:** The purpose of dust scrubber is similar to that of the cooler scrubber, where all dust particles from recycling equipment are scrubbed in a separator via dust cyclones. The scrubbing medium contains 20 to 23 % P_2O_5 .
5. **Tail Gas Scrubber:** The tail gas scrubber is a cylindrical vertical tower, equipped with separator, packed bed washed with several sprays and a demister in its final part, before the final stack. The off-gases from duct scrubber consisting of little quantity of dust, Ammonia gas, and a little quantity of Fluoride gas generated during phosphoric acid neutralization. The off-gas from duct scrubber finally enters into tail gas scrubber for the final scrubbing of pollutants. All process water is added to the tail gas scrubber and the water level is regulated in its reaction tank using a level controller. After washing in the packing section, water overflows to the bottom section of the cyclonic tower, where it is slightly acidulated with sulphuric acid to maintain the pH around 4-5. The off-gas from the tail gas scrubber is then directly released to the atmosphere. The pollutant concentration for ammonia, fluorine, and dust emitting from tail gas scrubbers are monitored through an online monitoring system that is connected to the CPCB server.

2. EXECUTIVE SUMMARY

IRCLASS systems and Solutions Pvt. Ltd. conducted the Third-Party External Safety Audit of at **Coromandel International Limited, Kakinada** between 28th February 2023 to 02nd March, 2023. The main objectives of the audit was to particularly examine Health & Safety (H&S) systems, to identify potential H & S hazards and suggest corrective actions, wherever necessary.

The information presented in the report is based on perusal of various documents and internal records pertaining to H & S, a sample inspection of the plant and discussions held with various personnel deputed at the location. The recommendations made herein in the report, are based on the conditions and systems prevalent in the plant and hence applicable only to the said facility.

The key findings of the Third-Party External Safety Audit are summarized in the following paragraphs.

2.1 NOTE WORTHY EFFORTS / STRENGTHS/GOOD PRACTICES

1. M/s Coromandel Management, officers and workers at large appear committed towards continual improvement on OHS. Management commitment towards various initiatives (such as PSM, Online systems for various safety tools and Implementation of safety programs was seen at various actions taken by the management.
2. Compliance to On line systems such as Incident reporting, MOCs, WPS was found in very good condition. MySetu Software being used for number of modules presently used are PIIR (Preliminary Incident Investigation Report), Unsafe act reporting, Near miss reporting etc.
3. Majority of the QRA, HAZOP, and Statutory audit recommendations have been implemented. As per the records, 20/21 QRA recommendations closed (one dropped), Ammonia Plant HAZOP Recommendations (65 out of 69), 2 dropped and 2 are in process of implementation and 45/46 Statutory audit recommendations have been implemented till date. (One has been dropped)
4. Legal compliance has been observed while checking the documents. Factory license No. 43857 for 20000 HP/14920 KW and 2000 manpower is under renewal (31/12/22). Till then, Provisional Certificate has been obtained from statutory authorities for year 2023.
5. Another Consent to operate from the Pollution board bearing APPCB CTO APPPCB/VSP/RJY/285/HO/CFO/2021 dated 1/10/2021 is valid till 30/9/2026.
6. Fire extinguishers were checked at tens of places and found to be complying with all the testing and inspection records and dates. Extra ordinary efforts are taken by HSE group in ensuring the compliance to a good level.
7. Administrative building and Technical buildings were found very nicely managed with excellent hygiene, boards displayed at strategic locations, glass panes with Red and Green dots indicating their significance, Fire extinguishers kept at various locations, stairs marked with arrows and fluorescent signage.
8. Most of the systems have been digitalised and plenty of information is being captured on line and accessible to all concerned.
9. Cascading system (Dragger) has been installed in the Ammonia Control Room. It is a new initiative for supplying breathing air from a centralised location backed by a very huge compressed storage vessel (300 psi) for Panel operator to control an emergency due to large ammonia storage outside.
10. Cascading system operation was checked by requesting the operator to exhibit the operator and he did very diligently.
11. Ammonia control room is equipped with special type of leak proof glass windows where toxic gases would not enter the control room. This modification has been done recently to prevent entry of any toxic gas inside the control room.
12. Safety record had been quite impressive. 5 Million Safe man-hours worked without an incident achieved as on date.
13. 5 S has been implemented successfully implemented in the achieved organisation with positive outlook. In some places, there was found to be having some scope for improvement.

14. It was observed that on Sulphuric acid storage tank is being constructed to enhance H₂SO₄ storage capacity.
15. Remote functionality of the deluge fire water system was seen from Control room over the two Ammonia Storage tanks.
16. It is learnt that new remote HVLRs are being installed to have effective way of dealing the ammonia vapours/ liquid in case of any eventuality. It may enhance the emergency preparedness of the organisation.
17. Operating staff was asked to demonstrate the use of SCBA in Ammonia Control room, which was demonstrated very well and within a time span of 2 minutes.
18. ECC was found to be nicely organised with all the communication channels, Documents of Onsite CSD/M/CSS-KKD-001 dated 31st January, 2022 and Off site DMP, Emergency and normal PPEs , P&IDs, General layout of the plant
19. 14 scenarios have been identified as per DMP including 3 external scenarios like earth quake, Tsunami /Cyclone and Bomb Threat.
20. **Distress Instruments for people working inside the confined area have been procured recently. It is an excellent initiative in direction of maintaining high standards of personal safety.**
21. Wind socks are installed at prominent high altitude locations for visibility and all were found to be in good working condition.
22. Process safety knowledge across the organization had been observed to be quite good, because of training and exposure provided by the management to management staff, non-management staff, and contractors.
23. UKHSL Survey Report exhibits good safety feedback from employees towards safety implementation of various programs by the management.
24. 81 first aiders have been trained in the plant considering that total manpower is around 1400 in all three shift including contract workmen. This number seems to be quite good.
25. There is a good number of portable fire extinguishers spread out throughout the plant and it undergoes periodic inspection and maintenance program.
26. It was observed that in the Electrical substation, a study on Lightning Arrestor System project has been done by M/s CAPE Electric and has been implemented at site as well.
27. Good regular maintenance with proper display of the test details at tens of earth pits is appreciable and praiseworthy.
28. Provision of water curtains and deluge system exists at MRSS 132 KV Substation and DAP trains.
29. At fire station, continuous availability of 2 Fire tenders (equipped with water & foam and DCP) was noticed.
30. OHC is round the clock manned by CMO and other paramedical staff.
31. Off site and on site Mock Drills are being carried out in process units to enhance competency of operating staff and the extent of emergency preparedness. Recently off site mock drill was carried in co-ordination with National Disaster Management Authority. It is learnt that AP State Disaster

Management Authority and District Chief Emergency Controller and District Collector witnessed the Offsite Emergency Mock-drill.

Opportunity for Improvement (OFI)

1. If a few HVLRS are located at an elevated platform one such redundant structure) was seen in the Ammonia storage area, its water throw could reach the Ammonia storage tanks. This feasibility can be studied where situation can be controlled much more effectively.
2. Fire water pressure recording on 24 by 7 hours basis could provide a useful trend over past 24 hours or may be even for longer duration to find out consistency in FW pressure. Currently, only pressure gauges are available at a few locations.
3. Safety video being shown at the Entrance gate for visitors/vendors is very effective as it communicates all the essential features of the theme of safety while entering the MAH industry. Later on qualification by the visitor for short but meaningful questions being mandatory is also praiseworthy. One point which auditors found, was missing was the location in the map of the plants in the video where “WE ARE NOW “. This would further make the video much more meaningful.

2.2 NON-CONFORMITIES & OBSERVATIONS

The key findings of the audit are detailed below. It may be noted that the specific area of audit during site visit has been considered. The audit findings are in reference of IS 14489, MSIHC Rules, and Pollution Control Board Rules, AP factory rules and other standards and good industry practice. The relevant standards were also referred during the Audit.

PROCESS

1. Water sprinkler system of Ammonia Storage tanks was operated remotely from the Control room. Water was not wetting the circumferential surface of the cylindrical double wall tank uniformly and eccentric flow was seen and overflowing from the deck of the tank from two three places. Probably it could be due to the partial plugging of the water sprinkler nozzles.
2. Another Ammonia storage tank was also checked for water sprinkler efficacy in case of eventuality and similar phenomenon was observed in the other tank. This problem needs an immediate permanent solution as it is a very important safeguard for combating any emergency situation considering the large inventory of Anhydrous Ammonia being stored.
3. Acid resistant tiles in the Sulphuric acid storage tanks was found missing at a few locations. It should be ensured to be available at all the drain locations where H₂SO₄ bottom draining /leak can enter.
4. Operation Manual and SOPs for all the plants should be revalidated every year.
5. No water overflow was noticed from the Flare U loop drain. Needs formation of proper water at all times that ensures avoidance of air into the flare and thus avoiding flammable gas mixture in an explosive range. Procedure for same needs to be reviewed and it is recommended to maintain water seal.
6. P & ID shall indicate correct interlock and delete the irrelevant interlock – (Ref. d 6289-3000 -002 rev 10 has same interlock having same nomenclature as I 205 and I 21
7. Phosphoric acid tank farm dyke capacity appeared to be low to act as an effective secondary containment in view of leak of the largest Storage acid bottom plate leak. This needs review in terms of capacity.
8. In lab, gas emission in a closed room from atomic absorption spectrophotometer should be considered as confined space emission – room should indicate oxygen content
9. MSDS sheets of very critical and Hazardous chemicals need to be displayed at each respective storage/Handling location. Although some simple boards were available, but in particular, requirement of displaying MSDS sheets needs to be met as per IS 14889.
10. Sweating and green algae was found on the shipping Ammonia line from jetty to plant over a very area. Could be that efficiency of the insulation has gone down or there are some air pockets. This could be leading to under insulation corrosion as well.
11. Copper jumpers were missing at a few flanges in NG area in Flare area.
12. Sulphuric storage tank T5 had validity up to 25th March, 2022. This tank certified or needs to be decommissioned.

13. Compressors of Ammonia plant – water sprinkler had low pressure of water the eye washer and Shower.
14. Phosphoric acid tank T 5 Due date and Done date was found missing.

HSE & FIRE MANAGEMENT

1. Welding activity was seen happening under WP/KKD/2022-23 /HOT/5536 with no barricading, no booth formation and no fire water standby. Permit requirements mentioned all the three, but none of them was followed. Naked flame can create problem in such an industry of hazardous nature.
2. Another Hot work permit also had similar deviation. WP/KKD/2022-23/HOT/5565 dated 27th February, 2023
3. HB 05 and HB 08 having fire hoses reels glass breaking hammer was further enclosed in a small glass housing, part of the box. Hammer should be easily accessible in case of any fire water s are to be removed from the box.
4. In Bagging Plant, DA cylinder being used for Gas cutting flexible hose had missing clamp attached to the torch gun. This needs to be ensured as any leakage of Acetylene could result into immediate formation of vapour cloud. (Highest LEL-UEL band).
5. For the last reportable accident (16TH December 2021) audit observed that corrective action should have more engineering controls such as interlocks, but the investigation included corrective actions such as “Guards and carrying out maintenance with two personnel instead of one”. Presence of an appropriate interlock or engineering control should have been there as part of solution to the LTA.
6. HIRA should review Reportable accident system in wider perspective and at greater length so as to cover all the aspects and thus suggest introducing new controls to reduce risk.
7. HIRA should capture potential hazards against Normal/ Abnormal/Emergency condition.

ELECTRICAL & INSTRUMENTATION

- 1) It is strongly recommended/suggested to keep the lead acetate batteries in a separate room and not Control Room as Hydrogen gas emission may circulate into the air conditioned environment. Thus may pose serious issue wrt safety. (H₂ emission during charging of batteries)
- 2) Only one Ammonia leak portable detector was seen in the Control Room. Number appeared to be low considering the criticality of operation. Tag with due date of next calibration was also found missing. It is suggested that at least one or two detectors should be provided in the Control Room. Each operator carry detector individually during their regular rounds inside ammonia area.
- 3) Ammonia detector near the entrance gate and pump in Ammonia storage tank was fluctuating from 0 ppm to 10 ppm. Suggested to recalibrate the instrument in view of its criticality.
- 4) Boiler No. 2 (Operating at that time), Air blower motor was found badly plugged with bird feathers, dirt and had presence of rusting. Cleaning of this is important as it cools the motor parts.

- 5) It is suggested to have a smaller range of calibration of Ammonia Detector as it can detect even a small leak of Ammonia with accuracy. It could be 5-10 ppm instead of 50 ppm. Bump test for that particular environment should be carried out at a scheduled frequency.

MECHANICAL

1. Ammonia Running Pump (Submergible) oil cup was found empty probably due to oil seal leak.
2. Boiler attendant adequacy may be checked as Class II Boiler attendants are manning the 239 sq meter surface area against validity of 200 for Boiler Attendant Class 2. Presently 3 second class and one First class boiler attendant are available for regular operation. .
3. Blistering / paint was found damaged over the NG lines in Boiler house area.
4. It was observed that in Mysetu, presently more than one permit can be issued for same system / equipment. It is suggested to issue one mother permit and all other permits can be extended depending the hazardous condition linking to the main permit.

OTHERS

1. Dust in and around bagging plant was comparatively high and this may be affecting the health of the people who are working regularly. Audit found out that new dust collection system in bagging plant is being procured and installed.
2. Moreover, it was learnt from Auditee that new road sweeping machines are being procured which shall be used round the clock to keep the area clean.
3. Hazardous Waste: On one side of the Sulphuric acid storage tanks, lot of sludge in form of cakes were found accumulated. From the discussions, it appeared that during the previous acid tanks M&I, bottom sludge while emptying out the tank would have been put there. This hazardous waste should be disposed at a designated location as notified by AP Pollution Control Board Rules.
4. General corrosion due to the coastal environment was affecting the structures and pipelines in the plant.
5. DAP AB Train Control Room can have better sealing arrangement so as to prevent entry of any dust/toxic gas into the Control Room.
6. Entry into the Natural gas stations should be restricted in flare area/ Boiler area.
7. DA cylinders should be handled more carefully to avoid any damage to cylinder or leak. Dropping of cylinders to be strictly prohibited, ramp can be used.
8. Safety competency for QA personnel may be considered while entering.

3. AUDIT CHECKLIST

3.1 TYPES OF RECORDS TO BE EXAMINED DURING THE SAFETY AUDIT ANNEXURE – B (IS 14489: 2018) (Clause 5.3.3)

SR. NO.	ITEMS	PLANT SUBMISSION	AUDITOR'S OBSERVATION	AUDITOR'S RECOMMENDATION
1.	OS & H Policy	Yes. It exists.	Yes. It exists.	Complied
2.	Safety Organization Chart	Company does have the Safety Organization Chart.	Checked and found in order.	Complied
3.	Training Records on Safety, Fire & First Aid	Training records are being maintained.	Checked and found okay.	Complied
4.	Record of Plant Safety Inspections	Plant Safety inspections being done and records maintained.	Checked and okay.	Complied
5.	Accident Investigation Reports	Accident investigations are being done.	Accident investigations are carried out by training Root Cause Analysis personnel. Incident checked is dated 13.01.2023. ECFA, MTO, Barrier Analysis done is done to identify root cause.	Complied
6.	Accidents, Dangerous Occurrences, Statistics & Analysis.	Records of any incident is being maintained and Root cause Analysis is being carried out.	PIIR (Preliminary Incident Investigation Online report) formats checked online.	Complied
7.	Record of Tests & Examinations of Equipment & Structures as per Statues	Records of periodic examination for lifting tools and Pressure plants is available	The requirement is complied as per AP factories Rules.	Complied
8.	Standard Operating Procedures (SOP) for various Operations	Yes. SOPs are there for all the operations.	Ammonia Control room- 33 SOPs are there for different operations. In order.	Complied.

9.	Record of Work Permits	Yes. Being maintained.	Checked and found in order.	Complied.
10.	Record of Monitoring of Flammable & Explosives Substances at Work Place	No flammable and explosives	Detectors are available. Natural gas is used in boilers and heaters	Complied.
11.	Maintenance & Testing Records of fire detection & firefighting equipment	Yes. Procedures exist. Being done.	They are tested and calibrated periodically	Complied.
12.	Medical records of employees	Yes. Being done.	Yearly Medical tests including audiometry is available	Complied.
13.	Records of Industrial Hygiene surveys (noise, ventilation levels, illumination levels, airborne & toxic substances, explosive gases).	Noise, Illumination levels are being maintained. AAQM stations and stack monitoring stations are located for monitoring.	Checked and found that third party support is being taken to measure and monitor fugitive emissions at various locations. Within limits. 35 fixed Ammonia detectors are located and being monitored in Ammonia Control Room on continuous basis.	Complied
14.	Material Safety Data sheets	Yes. MSDS sheet are made for all the chemicals.	Yes. Besides, MSDS for the products and raw materials, there are existing for Chemicals handled at Laboratory. (16 element Sheet)	Complied. MSDS need to be displayed in respective storage/handling location.
15.	On-site Emergency Plan & record of mock drills	Mock drills are being conducted at scheduled frequency.	Mock drill is conducted at interval of 3 months. Recently Offsite emergency mock drill was conducted at Ammonia Tank farm area. On site mock drill on 23 rd Feb 23	Complied
16.	Records of storage of hazardous solid waste disposal	Hazardous solid waste disposal records are being maintained.	Hazardous solid waste disposal records are being maintained. September 2022 records checked.	Complied

17.	Records of effluent discharges gaseous emissions and to the environment	Effluent discharge and gaseous emissions are being monitored	Effluent discharge and gaseous emissions are being monitored. September 2022 records checked	Complied
18.	Housekeeping inspection records	Housekeeping records are being maintained by respective plants	Housekeeping is part of ongoing 5 S program and evaluated area wise	Complied.
19.	Minutes of safety Committee meetings	General Safety Committee meetings are held and Minutes of meeting are made	Being held quarterly and records being maintained. It is under the Chairmanship of Unit Head	Complied.
20.	Approval of layouts & other approval from statutory authorities	Yes.	Along with factory license no 43857	Complied.
21.	Records of any modifications carried out in plant or process.	Yes. MOC's are being raised for modifications.	On line MOC system exists for carrying out modifications. MOC can be tracked by various modes.	Complied.
22.	Maintenance procedure records	SMP's and Work Instructions are being done.	SMP available for periodical testing of Marine Unloading arm	Complied.
23.	Instrumentation and equipment Calibration & testing records	Calibrations records are being maintained.	Calibration records are available.	Complied.
24.	Planned Shutdown maintenance procedures	Shutdown procedures are available.	It is followed. Presently Shutdown is carried out on Train A	Complied.
25.	In service inspection manuals, records including that of material handling	OEM's are available.	Air compressor package manual	Complied.
26.	OH & S budget	SRE 2.19 cr Capex budget Approx. 2 Crores	SRE 2.19 cr Capex budget Approx. 2 Crores	Complied.

27.	Inspection books & other Statutory records	Statutory records are being maintained.	Statutory records are available. Environment forms and returns are available	Complied.
28.	Records of previous audits.	Records are being maintained.	Last audit by Lumen Engg – 45 OFIs – all closed	Complied.
29.	Procedure for Safe transportation of hazardous substances	SOP's are available.	Procedure for unloading from jetty PSMS/SOP/OS/003	Complied.
30.	Records for breakdown of plants during the process of manufacture	Records are available.	Maintenance of plants along with PTW is seen	Complied.
31.	Records for waste material generated and their disposal	Waste material disposal records are being maintained.	Records of waste oil disposal as approved hazardous waste is available	Complied.
32.	SOP for disposal of waste materials	SOP is available.	SOP available of disposal of Non-hazardous waste	Complied.
33.	Records for issue of PPE items to the personnel working in process building.	Records of PPE's are being maintained.	Yes , issued by requisition	Complied.

ANNEXURE – C (IS 14489: 2018)
(Clause 5.3.4)

SR. NO.	ITEMS	PLANT SUBMISSION	AUDITOR'S OBSERVATION	AUDITOR'S RECOMMENDATION
OH & S MANAGEMENT				
OH & S POLICY				
1.	Does the organization have OH & S policy?	Yes. It is known as QEHS Policy.	Policy is enclosed	Complied
2.	Who has signed the OH & S policy?	MD, Coromandel has signed.	Signed by MD	Needs to be signed by the present incumbent.
3.	Whether the OH & S policy is per guidelines of the statutory provisions?	Yes	Yes , it includes compliance of legal requirements	Complied
4.	When was the OH & S policy declared and adopted?	Yes	9 th Jan 2020	Complied
5.	Whether the OH & S policy reviewed periodically?	Yes	Every three years	Complied
6.	Whether the OH & S policy is available in local language and made known to all?	Yes.	Local language display not evidenced	Local language display be available
7.	What was the last date of updation?	09.01.2020	Yes	Complied
8.	Does the policy find a place in the annual report?	Yes	Yes	Complied
OH & S ORGANIZATIONAL SET UP				
SAFETY DEPARTMENT				
9.	Does the factory have a safety department and what is strength of safety department?	Yes. It is a full-fledged Safety department.	Yes. It is a full-fledged Safety department. 17 is the strength of the Safety Department.	For information.

10.	Whether the strength and qualifications of Safety Officers are as per the statutes?	Yes. Strength is 17.	Strength is 17. Qualification of Safety officers is as per AP Factory Rules 1980 (Rule No. 61/3a)	Complied
11.	Does the head of safety department report to the Chief Executive?	Yes. He reports to AVP EHS at and simultaneously to Unit Head	Yes. He reports to AVP EHS at Kakinada and simultaneously to Unit Head	Complied
12.	How often are the safety officers retrained in the latest techniques of total safety management? What is the frequency of retraining?		Trained in process safety management. Last training done on June 2021	Complied
13.	What additional duties the safety officer is required to do?	Involvement in HAZOP studies, root cause analysis and PSSR, Kaizens besides normal duty as a Safety Officer.	Normal duties of Safety officers are described in the EHS manual ref IMS/SFTY/DI/00 dt 1/2/21	Complied
14.	What is the power of safety officer vis-a-vis unsafe condition or unsafe act?	In case, Safety officer finds an unsafe condition/ act by any person, he is authorized to stop the job .	Safety officer can stop the job till corrective action is taken in case any unsafe condition/act is noticed.	Complied.
SAFETY COMMITTEE (S)				
15.	Does the factory have a safety committee(s)? What are the types, structures and terms of reference of the committees?	Yes. General Safety meetings at interval of 3 months. It is chaired by unit head and members are HODs from all departments, Contractor and Non-management staff	Yes. General Safety meetings at interval of 3 months. It is chaired by unit head and members are HODs from all departments, Contractor and Non-management staff. Checked MOM and found in order.	Complied.

16.	Is the constitution of the safety committee(s) as per the statute?	Yes.	Constitution is as per AP Factory Rules	Complied
17.	How are the members of safety committee(s) selected? (nominated/nominated)	From MS, NMS and Contract Workmen	All Departmental heads and Senior management, contract staff by respective plants through HR and non-management staff are nominated by union.	Complied
18.	How often are the meetings of safety committee(s) held?	Quarterly.	Quarterly. Seen MOM , Nov 9 th 2022	Complied
19.	Are the recommendations of the committees(s) implemented?	Yes. Recommendations are implemented.	Recommendations are implemented within a time frame.	Complied
20.	Are the minutes of the safety committee(s) meetings circulated among the members?	Yes. All the points were circulated by mail.	All members of the committee are regularly communicated by mails for compliance.	Complied
21.	Are the minutes forwarded to the trade union(s) and chief executive and occupier?	Yes.	MOM are forwarded to all members, Unions ,	Complied
22.	Whether the management and trade union play their active roles in supporting and accepting the committee(s) recommendations?	Yes. Both work in collaboration and play constructive roles in implementation.	Yes. Both work in collaboration and play constructive roles in implementing the recommendations.	Complied
23.	How are the safety committee(s) members apprised of the latest development in safety, health and environment?		This is discussed as an agenda of Safety committee like the survey report or fire adequacy report	Complied

SAFETY BUDGET				
24.	What is the annual safety budget?	SRE 2.19 Crores (2022-23) Capex 2.0 Crores	SRE 2.19 Crores (2022-23) Capex 2.0 Crores	For information.
25.	How much percentage is this budget of the total turnover of the company?		Less than 1.0 %	
26.	How much budget has been utilized till date?	100 %	100 %	
27.	Is the safety budget adequate?	Yes.	Yes	For information
28.	How is the safety budget arrived at?	Input is taken from various departments including HSE. Mostly safety budget is approved as per the requirement.	Input is taken from various departments including HSE. Mostly safety budget is approved as per the requirement.	For information
29.	What is the pattern of expenditure for the last five years?		Approximately the same figure in each year	Complied
30.	What are the approved sanctions for the expenditure in this budget?	Most of the proposals are approved by the management.	As told by the auditee	Complied
31.	Does this budget get reflected in the annual report of the company?	No	No	For information
SAFETY MANUAL				Complied
32.	What is the periodicity of updation / review of safety manual?	As and when required	Recommended for annual updation/ review	Complied
33.	Does the safety manual adequately address all the hazards in the plant?	Yes. All adequately covered.	Risk register available department wise linked to Safety manual. DAP Plant	Complied

			RR-DAP -01 dt 25/3/21	
34.	Are the employee made aware of safety rules / instruction mentioned in the safety manual?	Employees, Non-Management staff and Contract are regularly provided training and made aware about the safety rules.	Training is being imparted for various topics such as Hot work safety, Work in confined area Chemical safety, Work at height , Scaffolding erection and dismantling etc.	Complied
STANDARD OPERATING PROCEDURES (SOP)				
35.	Are written Standard / safe operating procedures available for all operations and processes?	Yes. There are existing for all the operations.	Ammonia control room – 33 SOPs were seen and in order.	Complied
36.	Whether the written Standard / safe operating procedures are displayed or made available and explained in the local language to the workers?	Safety Instructions are written in respective areas in local language.	Safety Instructions are written in respective areas in local language. Checked and found in order.	Complied.
37.	Whether concerned section and safety department prepares standard / safe operating procedure jointly?	For SOPs, Champion and Team will prepare and get approve from Champion. EHS Team will also participate in review.	Safety department approves the SOPs and suggests if any changes are required in SOP.	Complied
38.	Are standard / safe operating procedures reviewed and updated?	Yes. As and when required.	Suggested to do it annually.	Complied
39.	Have the workers been informed of the consequences of failure to observe the standard / safe operating procedures?	Who are dealing the standards, they are well aware the SOP procedures and consequences and failure.	Pep talks are carried out normally. OJT are also carried out for workers	Pep talks Periodicity or methodology may be Formalized. Presently , Format
PLANT MODIFICATION PROCEDURES				

40.	What is the system for effecting any change in the existing plant, equipment or process?		Online MOC System exists. MOC/2022 - 23/25-42 generated on 5/11/2022 , BOILER DEARERATOR Steam line safety valve vent position Changed	Complied
41.	Whether the P & I diagrams and other related documents are updated accordingly?		Yes, P & I d-6289-300-002 Rev 10 highlights changes done after MOC.	Complied
42.	Whether hazard assessment done before implementation of modification?		Any Significant Change in PSI, HAZOP study is carried out. Also decided by Unit Head.	Complied
WORK PERMIT SYSTEM				
43.	What types of work permits exist in the factory?	Four types of permits - Cold Permit, Hot Permit, Radiography and Confined space exist.	Specimen work permit WP/KKD/2022-23/HOT/5038 dated 31 st January, 2023 checked and found completed. (Closed on 11 th February, 2023) C train DAP. Another permit WP/KKD/2022023/RAD/11 dated 2 nd December 2023 checked and found completed on online system.	Complied
44.	Are the necessary forms detailing required safety precautions have been prepared and used for each type of work-permit?	Yes. Separate forms exist for different kinds of jobs.	Yes. Checked. Sample Jo Safety Plan for Hot job and Radiography.	Complied

45.	Is the responsibility assigned to authorize person for issuing of safety work permit?	E-Permit training is being conducted and test being conducted after training.	Yes, responsibility and authority assigned to persons. issuing authority and approving authority	Complied
46.	Is the copy of safe work permit sent to safety officer before execution of the job?	Yes. Being sent to Concerned Safety Officer.	for checking gas or oxygen content	Complied
47.	Is validity period specified in the safety work permit?	Yes. Validity period is specified.	Yes	Complied
48.	Are the records of work permit available and maintained in proper order?	Yes. On line records and off line records	Hard copy and soft copy	Complied
CONTROL MEASURES FOR WORK AT HEIGHT				
49.	Is adequate safe access provided to all places where workers need to work?	Yes. Safe access is provided. Metallic scaffoldings are being used.	Yes , MS pipes are used for all members of scaffolding	Complied
50.	Are all such access in good condition?	Yes. Access are maintained nicely.	Yes. Checked.	Complied
51.	Are all scaffolds are properly designed and erected?	Yes. Designed and erected.	Certified by the Company Scaffolding Inspectors.	Complied
52.	Are scaffolds inspected every day before work begins?	Being inspected every day before work starts. (only visually)	Scaffolds are visually inspected every day before start of work	Complied
54.	Are planks in good condition?	Yes.	Yes. Planks are adequately clamped.	Complied
55.	Are scaffold walkways, platforms, runs or stairs free of debris, grease, any unnecessary obstruction and projecting nails?	Yes. There is no obstruction prior to use the scaffolding and access.	Access are clear of any obstruction and there is a clear passage. (Samples checked and found okay)	Complied

56.	Are the scaffolds higher than 20 m.? If yes, is a netting or intermediate railing provided between toe-boards and hand railings?	Yes. Scaffolding is erected as per standard procedures. Netting is used as a safety measure for fall protection.	Yes , SOP is available	Complied
57.	Are folding stepladders properly used?	Yes.	Rarely , but depending upon the situation, are used after adequate check ups	Complied
58.	Are ladders set up at the proper slope of about 1:4?	Yes. Being followed.	Yes. Verified on sample basis. It is meeting.	Complied
59.	Do workers use hand lines to lift tools or materials?	Yes.	Yes	Complied
60.	Are proper ladders used around electrical hazards?	Yes. Proper ladders are used around areas where electrical hazards could be present.	Yes . Insulation is intact	Complied
61.	On sloping roofs, are crawling boards, lifelines, safety belts and edge protection provided where needed?	Yes.	Lifelines are used on tanker top operation ; also used fall arrestor with safety harness to move on top of tanker	Complied
62.	Whether the weak spots, skylights, or deteriorated asbestos-cement boards through which a worker might fall while working in the roof has been identified and safety net provided appropriately?	We don't have any weak spots. If anything is noticed, immediate action will be taken to avoid falling hazard.	AS per information collected, corrective action is taken.	Complied
63.	Are the workers being medically examined for their fitness to work at height?	Yes. Each contract person is being imparted training	Yes. Records are available.	Complied

WORK IN CONFINED SPACE				
64.	Is work permit system followed for working in confined space?	Yes. Separate work permit exist.	Yes. Separate class of permit exists for work in confined area.	Complied
65.	Whether monitoring of the atmosphere inside the confined space is carried out and ensured that there is no flammable or toxic gas in the area?	Yes, we are having 3 Multi gas detectors, 7 Ammonia detectors and 4 Oxygen detectors with calibration.	Plant is having 3 Multi gas detectors, 7 Ammonia detectors and 4 Oxygen detectors with calibration.	Complied
66.	Whether the person entering the confined space is using suitable personal protective equipment (PPE)?	Yes.	In control room, suitable BA set available including BA cylinder manifold. In lab the instrument room can be denoted as confined space	Complied
67.	Is rescue team available in case of any emergency?	Yes.	Lifeline and rescue person is earmarked for all confined space entry	Complied
CONTRACTORS' SAFETY SYSTEM				
68.	Is there any system for selection of contractors?	Based on the compliance performance and safety adherence performance in the past the final decision of contractor finalization shall be done.	Procedure CSD/P/CSS-03 dt 3/10/21	Complied
69.	Are there any guidelines on contractor's safety and training?	Yes, PO it consists of safety PPE, mandatory training programs also mentioned	PO no 200310048 dt 11/7/22 seen at least five guidelines on Safety requirements.	Complied
70.	Whether contract document includes necessary safety and welfare clauses as per statutes?	Yes	Safety clauses are included	Complied

71.	Is there any programme to ensure use of PPE by contractors personnel	At the time induction and timely at regular intervals	Yes, one of the Clauses talks about PPE	Complied
72.	Do the contractors have their own safety organization?	No	Medium size contractors have person deputed as Safety officer	Complied
73.	Are the contractors reporting all accidents and injuries?	Yes	Yes they are bound by contract	Complied
74.	Are contractor workers trained to observe safety at work place?	Yes	Yes, induction of safety carried out including refresher training.	Complied
75.	Whether contractor workers are engaged in process / operations? If yes, are they aware of safe operating procedures?	Not directly, and every safety process awareness imparted	As helpers, they are assisting operators	Complied
PLANT DESIGN AND LAYOUT				
76.	Whether hazardous operations in the plant are segregated?		Plant has hazardous area classification drawing ; diesel storage is segregated	Complied
77.	Whether occupational health & safety aspects are considered during the design?		Yes , all gas emissions are identified	Complied
78.	Are all the equipment provided with adequate space for working, maintenance etc.?		Yes	Natural gas area in plant May be barricaded
79.	Are the storage tanks provided with enough space / clearance between them?		Yes about 3 metre clearance available	Complied

80.	Whether the plant layout has taken care of the movement of fire-fighting equipment and emergency exits?		Yes adequate space is available	Complied
MEDICAL MANAGEMENT OF ACCIDENTS				
81.	Are medical facilities available with trained first aid staff and equipment in round the clock shift for all including contractors?		Yes and supported by male nurses in dispensary round the clock	Complied
82.	Is the ambulance van available for round the clock basis with the dedicated driver?		Yes. one ambulance is available for 24x7	Complied
83.	Is there any mutual aid scheme available with the nearest hospitals to manage and treat injuries during emergency?		Yes , port hospital is 2.5 kms away	Complied
84.	Are the workers /contractor workers aware of emergency medical facilities?		Yes	Complied
MANAGEMENT OF EMERGENCIES (NATURAL / MAN-MADE)				
85.	Does the system exist to detect and control these Emergencies?	Yes, Emergency Response and Planning manual is available.	CSD/M/CSS-KKD-001 dt 31/1/22	Complied
86.	Are the employees aware of the measures to be taken during emergencies?	Yes. Conducted trainings on ERP.	Last conducted 23/1/2023, for 2 hours training capsule	Complied
EMPLOYEES SELECTION AND PLACEMENT				
87.	Whether norms are available for selection of different category of employees?	Yes, Competency based interview based on the role	Competencies are identified for Various categories	QA may have basic safety competencies identified

88.	Whether pre-employment medical examination is being conducted for employees?	Yes, as per the recruitment process	Mandatory pre employment Examination	Complied
89.	Is there any procedure to evaluate safety awareness and record of the employees during their promotion?	Yes, Contributions and Key tasks	Induction training evaluates safety awareness	Complied
SAFETY CULTURE				
ATTITUDES OF MANAGERS				
90.	Do the managers follow the plant safety rules at all times?	Yes, any meeting starts with Safety.	Yes , Management is safety conscious as per UKHSL report	Complied
91.	What are their attitudes towards safety reviews and audits?	Very Positive	More than average accepted figure	Complied
92.	What is the response of management to safety violation?	Immediate response is applied for violations.	Any Violation is discussed by EHS and managers and response given	Complied
93.	Whether safety related decisions are taken in consultation with the workers?	Yes.	Yes , as Informed in safety committee Meeting	Complied
94.	What is the attitude of the managers towards nonuse of personal protective equipment?	Immediately stop and counsel and educate and motivate.	Noncompliance of PPE is not tolerated	Complied
ATTITUDES OF WORKERS				
95.	Whether workers are aware of the consequences of their wrong actions?	Consequence management	Yes, They have been trained for the SOPS	Complied

96.	Are laid down safe working procedures followed strictly?	Yes	Yes and Records are available for Procedures followed	Complied
97.	What is the attitude of the workers towards their own mistake, which can prejudice safety?	Safety is everyone responsibility and take utmost care	Practice is to accept own Mistake	Complied
98.	Do the workers report near miss incidents and suggest safety improvements?	Yes	Employee 191, Workmen 16 Feb : less than 20	Should have targeted objective
99.	Are the workers aware of the system of rewards and sanctions relating to safety matters?	Yes	Rewards such as Best Safety Workman is given for Every month , last held Jan 2023	Complied
100	What is the attitude of workers towards use of personal protective equipment?	Positive	PPE compliance is good	Complied

STATUTORY LICENSES, APPROVALS AND RECORDS

101	Whether all the safety related Acts / Rules (with latest amendments) applicable to your organization identified, informed to all employees and complied?	Yes	Factory license no 43857 valid till 31/12/2022 - renewal applied	Complied.
102	Whether the licenses have been validated?	Yes	APPCB CTO APPPCB/VSP/RJY/2 85/ HO / CFO/2021 DT 1/10/2021 IS VALID TILL 30/9/2026	Complied

MOTIVATIONAL AND PROMOTIONAL MEASURES FOR OH & S

103	Does the factory have occupational health and safety suggestion scheme?	Yes.	Suggestion scheme	Complied
104	Are occupational health and safety contests organized in the factory?	Yes. In view of National Safety Day, World Environment Day	National safety week organizes number of Competitions of posters , slogans etc	Complied
105	Does the factory participate in National Awards?	Yes.	Yes, Participating in NSC, CII SR safety Excellence award	Complied
106	Has the factory been awarded during last five years?	Yes. Received Kalinga Safety Excellence Award. ABK-AOTS award.	Plus CII SR EHS excellence award 4 star	Complied
107	Does the organization publish safety bulletin / newsletters?	Yes. Daily Safety Minute topics are being circulated on daily basis.	Seen today Dropped Objects safety	Complied
108	Whether the safety bulletins are widely distributed?	Yes.	Amongst employees	Complied
109	How is the occupational health and safety information including accident statistics disseminated in the factory? (Bulletin boards, Newsletter etc.)	Every month Health Bulletin is being circulated		Complied
110	What are the activities conducted during National Safety day / week?	Safety Poster competitions, Safety Skits, Safety quiz, Drawing competitions, Safety essay writings, Safety Talk and etc,,.	Yes	Complied
111	What is the percentage of Workers participating in the various safety promotional activities?	All are actively participate in Safety competitions.	Yes	Complied

HAZARD IDENTIFICATION AND JOB SAFETY ANALYSIS				
112	Was an initial process hazard analysis (PHA) completed?		Yes, HAZOP study last carried out by agency Thyssenkrupp industrial solutions	Complied
113	What are the stages of PHA? Whether a dedicated group is identified for PHA?		Third party identified who carried out the study with technical services	Complied
114	Was the PHA appropriate for the complexity of the process and identify, evaluate, and control the hazards involved in the process?		Yes	Complied
115	Does the hazard evaluation use one or more of the following PHA methodologies: What-If Analysis, Process Checklist, Hazard and Operability Study (HAZOP), Failure Mode and Effects Criticality Analysis (FMECA), Fault Tree Analysis (FTA) or any other appropriate equivalent methodology?		The two Methodologies of PHA are HAZOP and QRA is carried out. HAZOP is by TKIS on 2021 and QRA by M/s Lloyd on 2022	Complied
116	Does PHA assure addressing issues of inherent safety features with respect to material and their properties?		Yes with proper instrumentation and process control	Complied
117	Does the PHA address the hazard identification, incidents history, consequences		Yes as per HAZOP standard followed the study	HAZOP/HIRA should capture the reportable incident with a Fresh perspective

	of failures (engineering and administrative controls), human factors, consequent analysis with respect to possible safety and health effects of failure of controls?			
118	What are the stages of PHA? Whether a dedicated group is identified for PHA?		Yes, Identify – study – Recommendation – actions – compliance – P & ID updation	Complied
119	Does the system exists to promptly address findings and recommendations of PHA?		Yes, while the Study is carried out on 2021 and Closure on 2022	Complied
120	Are the PHA's updated and revalidated at least every five years by a qualified team to assure that the PHA is consistent with the current process?		Yes, last done 2021 and QRA 2022	Complied
121	Whether the activities requiring Job Safety Analysis have been identified?		Yes , all hazardous work under Permit to work comes under Job safety analysis	Complied
122	Whether the identified jobs for Hazard Identification have been carried out by trained and experienced persons?		HIRA has been carried out for all activities .	It should contain N/A/E conditions
123	Whether the checklists have been prepared on each Job Safety Analysis and are being used while carrying out the job?		Yes , used along with PTW	Complied
PRODUCT SAFETY				

124	Whether hazards arising from use of the products are identified?	Yes. Risk Register are being maintained.	MSDS of DAP available	Complied
125	Whether material safety data sheet prepared for the products?	Yes, under PSI	YES	Complied
126	Are all the products labeled and packed appropriately?	Yes.	Yes	Complied
127	Whether safety instructions are given along with products?	Yes.	Yes , in local languages	Complied
128	Whether policy exists for recall of products?		Yes	Complied
SAFETY TRAINING				
129	Whether training needs have been identified?	Yes. Every month training plan is being done apart from regular trainings are being conducted by Safety dept like Hot Work, Height Work, Confined space, Scaffolding erection and dismantling, Chemical safety, Material handling, Safe Start and etc.,	Checked. Seen from records that training is being imparted for various kinds of topics related to operations, safety and maintenance.	Complied
130	Is there any programme of induction training, its duration and topics covered?	Yes. Every person under go with Safety Induction training.	Induction training of visitors experienced on 28/2. Induction training for workman and Employee is also available	Complied
131	Whether the assessment of the trainees has been carried out?	Yes.	Yes , Post course questionnaire	Complied
132	What are the infra-structural facilities available for training?	Scribbling Pads, Pens, Projector, Screen, AC, Trained personnel, Canteen facilities.	Evaluation by online and Questionnaire	Complied

133	Whether training is conducted by qualified person?	Yes.	By Subject matter experts	Complied
134	Whether trainers are being re-trained from time to time?	Yes.	Yes , validity of Certificates sought at times	Complied
135	Whether proper records of training program conducted are maintained?	Yes. Training records are being maintained.	Yes	Complied
136	How training programs are evaluated?	Evaluation checklist is being maintained.	Yes	Complied
137	Whether schedule for training on occupational health and safety is available and maintained?	Yes. Every month Safety Training plan is circulated by L&D dept.	Yes	Complied
138	Whether the training programmes are reviewed?	Yes. Reviewed by HR dept.	Training programs are reviewed at the end by senior management and Feed back is taken from the participants.	Complied
139	Are all the employees periodically trained / retrained and what is the frequency of such training?	Yes.	Periodicity is not defined. But training is imparted at regular intervals on different topics.	Complied
140	Are the retraining needs identified whenever a new process / products and change in existing process introduced?	Yes.	For new systems, training is imparted to the concerned personnel.	Complied
141	Whether training covers top management?	Yes.	Yes , for PSMS trainings	Complied
142	How many hours of safety training is given to different employees?	Minimum 3 hours.	3 hours	Complied

CHANGE MANAGEMENT				
MANAGEMENT OF CHANGE				
143	Are there written procedures for managing change to process chemicals, technology, equipment and procedures and changes to facilities that affect the plant process / system operation?		MOC is online which is one of the modules of Mysetu	Complied
144	Do the procedures assure that the technical basis for the proposed change addressed prior to any change?		Yes , assessment criteria in four sections at various levels	Complied
145	Do the procedures assure that the impact of the change on safety and health addressed prior to any change?		Yes , check list in assessment criteria followed	Complied
146	Do the procedures assure that modifications to operating procedures are addressed prior to any change?		Yes , PSSR is also done	Complied
147	Do the procedures assure that the necessary time period for the change is addressed prior to any change?		Yes	Complied
148	Do the procedures assure that the authorization requirements for the proposed change are addressed prior to any change?		Yes , at every stage MOC has authorization	Complied

149	Are employees involved in operating a process, and maintenance and contract employees whose job tasks will be affected by change informed of, and trained in, the change prior to the start-up of process or affected part of process / operations?		Yes , included in PSSR as a check list	Complied
150	Is the safety information is reviewed and updated on changes?		As necessary including Carrying out a HAZOP , Changes in P & ID etc	Complied
151	Are the operating procedures or practices updated?		Procedure for unloading - jetty , PSMS/SOP/OS/003 REV NO 16 1/12/22	Complied
MECHANICAL INTEGRITY				
152	Does the mechanical integrity program include for all mechanical equipment including pressure vessels and storage tanks, piping and components, relief devices and vent systems, emergency shutdown systems, pumps, control systems?	We have MI program under PSMS system with schedules containing all safety critical equipment like pressure vessels, piping, storage tanks, valves etc.	Mechanical integrity programs exist for various equipment. Equipment/ tanks/ vessels are inspected as per the scheduled frequency.	Complied
153	Are there written procedures to maintain the on-going integrity of process equipment?	Yes procedures are written as per Codes & Standards.	Procedures available for Periodical examination of vessels , Tanks , external examination , Foundation of big tanks , Structures available	Complied

154	Whether training been provided to each employee involved in maintaining the on-going integrity of process equipment?	Yes, all personal are identified & trained as a part of our Training element in our PSM system.	Yes , PSMS training on asset integrity module for all personnel in Inspection department	Complied
155	Are inspections and tests performed on each item of process equipment included in the program?	Yes, all types of inspection are mentioned in the program.	NDT inspection as per Quality plan available	Complied
156	Does the inspection and test frequency meet the manufacturer's recommendation and good engineering practice?	Inspection frequencies are as per our various International standards Coromandel RAGAGEPS.	Yes	Complied
157	Are inspections and tests performed more frequently if determined necessary by operating experience?	Yes, based on inspection recommendations and operating experience frequencies are dynamic.	Frequency observed as yearly , every two years . Focus is to complete all inspection during annual Shutdown	Complied
158	Are deficiencies in equipment that are outside limits corrected before further use so as to assure safe operation?	Yes, inspection recommendations are attended based on severity.	Yes , For Critical operation , redundancy is also available	Complied
159	In the construction of new plants and equipment, whether quality assurance programmer is implemented to ensure that equipment fabricated is suitable for the process?	Yes, QAP is made and being followed for new construction to ensure quality.	Quality assurance plan is done	Complied
160	Are appropriate checks and inspections made during equipment installation stage?	Yes, inspections are made as per our Pre-Startup Safety Review program before start-up.	PSSR for all installations with Pre trials etc	Complied

161	Are the suitability of maintenance materials, spare parts and equipment ensured during maintenance?	Yes, MOC of all the equipment & spare parts are ensured as per drawings and specifications.	Yes	Complied
PHYSICAL HAZARD				
HOUSEKEEPING				
162	Are all the passages, floors and the stairways in good condition?	Yes.	Production floor area in DAP requires cleaning of solids near Conveyor and Granulator	Complied
163	Is glass door taped or otherwise marked to make it visible to workers?	Yes. Glass door is marked with Tape.	Yes	Complied
164	Do you have the system to deal with the spillage?	Yes. Spill kits are provided.	Yes	Complied
165	Do you have sufficient disposable bins clearly marked and whether these are suitably located? Are containers of refuse (waste) and trash emptied at the end of every day or soon after they are full? Are the containers or bins regularly cleaned?	Yes. Bins are placed at prominent places to collect.	Yes , at places bins are available	Complied
166	Are drip trays positioned wherever necessary?	Yes.	The areas are having dykes to contain liquid spillage	Complied
167	Do you have adequate localized extraction and scrubbing facilities for dust, fumes and gases? Please specify.	Yes. Pre scrubber, Cooler scrubber, Dryer scrubber, Dust scrubber and Tail Gas scrubber for dust and fumes extraction. DD systems are provided for dust collection.	Yes , main scrubber handles all exhaust which is monitored 24X7	Complied

168	Whether walkways are clearly marked and free from obstruction?	Yes	Needs improvement	Complied
169	Do you have any inter-departmental competition for good housekeeping?		Part of 5S	Complied
170	Has your organization elaborated good housekeeping practices and standards and made them known to the employees?	5S system is being followed.	5 s evaluation area wise is carried out	Complied
171	Are there any working conditions, which make the floors slippery? If so, what measures are taken to make them safe?	Slippery surfaces to be covered with saw dust and sand to make area dry.	Dust is present inside plant area	Complied
172	Does the company have adequate measures to suppress polluting dust arising out of materials stored on the roadside?	Yes.	No additional measures for large solid storage in plant by the wayside	Complied
MACHINE AND GENERAL AREA GUARDING				
173	Whether machinery and equipment which can cause physical injuries to operator have been identified?	Yes. All rotary equipment are provided with guards.	Verified at site and it is in order. Safety department is maintaining necessary records.	Complied.
174	Are all moving parts and point of operation of machinery adequately guarded?	Yes. Adequately guarded.	Many equipment and records checked. Found in order.	Complied.
175	Are all fixed guards securely bolted in position and in good condition?	Yes.	Mostly in good condition at site verification.	Complied.

176	Are all interlock guards for prevention of physical injury in good condition?		Needs review. Presently emergency Push Buttons are provided	Interlock guards at (man) entry places should be reviewed
177	Are all emergency stop buttons effective and clearly labelled?	Yes.	Site verification on sample basis shows good compliance. (Ammonia compressors, pumps etc.)	Complied
178	Are the operators for machines having moving parts aware of the danger of working with loose clothing?	Yes.	Sample basis of the population shows good awareness.	Complied.
179	Are the openings where there is free fall hazard covered or fenced securely?		Fully covered	Complied
MATERIAL HANDLING				
180	Are adequate equipment available for handling materials?		Bag loading on rakes are manually done	Complied
181	Are the workers aware of the hazards associated with material being handled?		Workers do not have personal protection	Complied
182	Where manual handling is necessary, are the workers been trained? Do they practice this? Are workers warned for lifting of excessive weight? (Maximum weight of material for adult male and female are 55 Kg and 30 Kg respectively)		Male Workers do not carry more than 50 kg of material	Manual handling training may be required

183	Do workers follow safe procedures for storage of materials?		Yes	Complied
184	Is the register maintained to record particulars of examination of all lifting machines, tools and tackles?		Yes , Form no 10/11 filled	Complied
185	Are all the statutory examinations and tests carried out and certified by competent person(s)?		Yes , approved by DISH	Complied
186	Are the operators of crane, lifts, hoists and other mechanized operations adequately qualified?		Operators have license of operating Heavy vehicles	Complied
187	Is the safe working load clearly marked?	Yes. It was clearly visible.	Yes. Agreed. Found in order on sample HOT, Cranes and Hydras.	Complied.
188	Has the person employed to operate crane, forklift, or to give signals to crane been medically examined for eyesight and color vision?		Yes	Complied
189	Is the frequency of eyesight and color vision examination as per the latest rules?		Eye sight Check is carried out .	Complied
ELECTRICAL SAFE GUARDING				
190	Are licensed electricians available for electrical work?	Yes. licensed electricians available for electrical work	Verified for licensed electricians availability for electrical work at site. 11 KV -10	Note worthy: Electrical competency certificates are displayed in all Sub stations

			132-04 APPLIED	
191	Whether area classification for electrical equipment has been carried out?	Yes. Area classification for electrical equipment has been carried out. HAC drawings and reports	Verified HAC drawings in the field.	Note worthy: HAC study carried out by TP and implemented recommendations
192	Do the electrical fittings conform to area classification for electrical equipment?	Yes. electrical fittings conform to area classification for electrical equipment	Verified electrical fittings conform to area classification for electrical equipment Sample: 1. Ammonia Area 2. NG area	
193	Is a ground fault current interrupter system (ELCB) in use?	Yes. Ground fault current interrupter system (ELCB) in use	Verified ground fault current interrupter system (ELCB) in use at site.	Noteworthy: RCCB are in use.
194	Are all connections made by using appropriate plugs, receptacles or enclosures? Are fuses provided?	Yes. All connections made by using appropriate plugs, receptacles or enclosures. No fuses are used.	Verified connections made by using appropriate plugs, receptacles.	Complied
195	Are there any make shift connection bare wires or damaged cables?	Yes, No make shift connection bare wires or damaged cables	Verified for any make shift connection bare wires or damaged cables	Note worthy: Part of GI Trays have been replaced with FRP cable trays.
196	Is there a system of ensuring periodical inspection of hand tools, extension boards used for electrical work?	Yes. system of ensuring periodical inspection of hand tools, extension boards used for electrical work is in place	Verified the system of ensuring periodical inspection of hand tools, extension boards used for electrical work at site	Complied
197	Do the workers use proper types of PPE during the working on live line?	Yes, No live line work workers use proper types of PPE during the	Verified workers use proper types of PPE during the working .HT & LT gloves	Noteworthy point: Arc flash suite are made available in SUB-STATION.
198	Is the separate work permit issued for	Yes, separate work permit issued for working in MRSS	Verified work permit issued for working IN MRSS	Noteworthy point: Electronic work permit along with isolation

	working on high voltage line?			certificate and LOTO is the practice.
199	Whether the process(s) and equipment that generate and accumulate static charge have been identified?	Yes. NO static charge hazard However training on static electricity has been imparted.	Verified the documents and found satisfactory	Complied
200	Whether all such equipment including pipelines for flammable materials are properly bonded and earthed?	Yes, all such equipment including pipelines for flammable materials are properly earthed	Verified all equipment including pipelines for flammable materials are properly earthed	Complied
201	Whether earth pit resistance is measured and the record maintained?	Yes, earth pit resistance is measured and the record maintained	Verified earth pit resistance is measured records	Noteworthy point; All earth pits are provided with a display board date of test and next test date.
202	Whether lightning arrestor has been installed and is adequate?	Yes, lightning arrestor has been installed and are adequate	Verified lightning arrestors at site	Note worthy point; TP study and implemented Recommendations
SAFETY IN STORAGE AND WAREHOUSING				
203	Whether the Material Safety Data Sheet for all chemicals is available?		Yes , compiled with 10 sections	Complied
204	Are the chemicals stored as per their hazardous properties including the incompatibility?		Yes , A separate acid tank farm Exists , OHS/OCP/17 , 30/6/21	Complied
205	Are all containers clearly, indelibly labeled? Are all chemicals stored as per safety regulations?		Yes , all tanks are available with labels	Complied
206	Whether all racks and steel cages have		Yes , sufficiently OK as seen in Lab	Complied

	sufficient load bearing capacity?			
207	Is adequate natural ventilation provided to store room? Is there any emergency exit?		Chemical storage in lab has exhaust provision	Complied
208	Whether adequate fire-fighting arrangement existing in flammable chemical storage?	Yes. Do exist for Ammonia service. Phosphoric and Sulphuric acids are not flammable.	Yes	Complied
209	Whether methodology for handling spillages of hazardous chemical available along with the equipment required handling the spillage?		Spill kit is available for Chemical , Eye wash available and working	Complied
210	Whether aisles are marked and emergency exits displayed?		Yes , ammonia storage has emergency gate	Complied
HAZARD ASSESSMENT FOR NEW EQUIPMENT				
211	What is the system for effecting any change in the existing plant, equipment?		Management of Change available on line as a module of MySetu	Complied
212	Is there system for evaluating hazards from new equipment?		Yes , HAZOP or HIRA all MOC as Reviewed by approving authority	Complied
213	Whether the P and I diagrams and other relate documents are updated accordingly?		Yes , D-6289-3000-002 REV 10 , updated after HAZOP	Complied
214	Is any Job Hazard Analysis (JHA)?		JHA carried out specifically for all hazardous work	Complied
HAZARDS FROM RADIATION SOURCES				
215	Whether licenses have been obtained for	Not applicable.	Not applicable.	Not applicable

	storage / handling of radioactive material?			
216	Whether approved Radiological Safety Officer appointed?	Not applicable.	Not applicable.	Not applicable
217	Whether appropriate PPEs are used against radiation hazards?	Not applicable.	Not applicable.	Not applicable
218	Is the flooring of the radioactive material handling area amenable for proper decontamination?	Not applicable.	Not applicable.	Not applicable
219	Is the storage room of radiation source as per the license condition?	Not applicable.	Not applicable.	Not applicable
220	Are all persons working in the facility have radiation safety training?	Not applicable.	Not applicable.	Not applicable
221	Is the operator handling devices using radioactive materials qualified and possess the necessary certificate?	Not applicable.	Not applicable.	Not applicable
222	Is the periodical radiation monitoring carried out?	Not applicable.	Not applicable.	Not applicable
223	Are the records of inventory of radioactive material maintained in the standard format and submitted to the competent authority as per the period specified?	Not applicable.	Not applicable.	Not applicable
224	Are emergency handling tools available?	Not applicable.	Not applicable.	Not applicable

225	Are the personnel monitoring badges (TLD, Pocket dosimeter etc.) assigned and worn by each radiation worker?	Not applicable.	Not applicable.	Not applicable
226	Are the radiation symbol and red light displayed as required?	Not applicable.	Not applicable.	Not applicable
CHEMICAL HAZARD				
TRANSPORTATION OF HAZARDOUS SUBSTANCES				
227	What potentially hazardous materials are transported to or from the site (including wastes)	<p>Yes. Phosphoric acid is transported through coastal route as well as through tankers.</p> <p>All three major products Ammonia, Phosphoric acid and Sulphuric acid are transported from Jetty to Plant through pipe line.</p>	<p>Yes. Phosphoric acid is transported through coastal route as well as through tankers.</p> <p>All three major raw materials Ammonia, Phosphoric acid and Sulphuric acid are transported by dedicated pipe lines from Jetty to Plant through pipe line.</p>	Information only
228	<p>What modes of transport are used?</p> <p>1) Road,</p> <p>2) Rail, and</p> <p>3) Pipelines</p>	Road and Pipe lines	<p>All three Ammonia, Sulphuric acid and Phosphoric Ammonia from Jetty to Plant by dedicated pipe lines.</p> <p>Phosphoric acid & Sulphuric acid occasionally are transported into the plant by road tankers.</p>	Information only
1) ROAD				
229	Does the company employ licensed vehicle of its own / outside sources?	Outsourced vehicles	Outsourced vehicles	For information only

230	Are the loading / unloading procedures in place and safety precautions displayed?	Yes. Loading /Unloading Procedures/SOPs are in place and being used.	Unloading of tankers SOP PSMS/SOP/OS/012 dated 30/11/2020	Complied
231	Is there a provision to check the healthiness of road tanker with respect to explosives rules?	Not applicable.	These are not covered under Explosives Rules	Complied
232	Are loaded tankers or trucks parked in a specific area on-site?	Yes.	Parked at designated place	Complied
233	Do all truck and tanker drivers carry transport emergency (TREM) card or instruction booklet?	Yes. They carry TREM card	Trem card is being carried by Truck drivers.	Complied
234	Do all truck and tanker drivers get training in handling emergencies during transport?	Tanker drivers are trained and have got valid certificates.	Tankers are inspected at gate by Safety Department personnel before entry itself. Drivers are trained for handling emergencies.	Complied
235	Are all the tankers marked for proper Haz Chem code?	Yes. HAZCHEM code is there.	HAZCHEM code is printed on the trucks.	Complied
2) RAIL				
236	What hazardous materials are transported by rail?	Not applicable.	Not applicable	Complied
237	Does the company have a direct siding on site?	Yes. Wagons are coming frequently for delivery of the finished product Growmor (Fertilizers in bags)	Yes	Complied
238	Are tankers or other wagons used in transportation?	Yes.	No	Complied

3) PIPELINES				
239	What materials are transported to and from the site by pipelines?	Sulphuric acid, Phosphoric acid and Anhydrous Ammonia	Yes , three pipelines runs from KSPL jetty to Plant offsites	Complied
240	Are the pipelines underground or over ground?	All above ground pipe lines. Only NG line is partially under ground.	Natural gas line from GAIL	Complied
241	Are corrosion protection measures employed in pipelines?	Yes for under ground lines, Cathodic Protection is there. For above ground, painting and insulation protection is there.	Yes	Complied
242	Whether intermediate booster pumps are used?	Yes, only for fire water.	Yes	Complied
243	What is the maximum, minimum and average transfer rate?	Ammonia 48 m3/Hr Max, Sulphuric Acid 50 M3/Hr. Max Phosphoric Acid 50 M3/hr. max	Yes	Complied
244	Are the pipelines extended in the public domain?	No	Runs through Seaport property and Land for about 2.5KM	Complied
245	Are the pipelines dedicated for each type of chemicals?	Yes. Separate pipe lines for all three imported chemicals.	Yes , Uses Loading arm of 8" for ammonia unloading	Complied
246	Are the pipelines fitted with safety equipment such as leak detectors, automatic shut-off valves etc.?	Automatic shutoff valves are provided at jetty for each chemical can be operated from Control Room through DCS.	Yes . Ammonia Detector available at Jetty .	Complied
247	What is the frequency and method of testing of the pipeline?	Ammonia - 4 years Sulphuric acid and Phosphoric acid - 2years	Ammonia - 4 years	For information.

			Sulphuric acid and Phosphoric acid - 2years	
248	Is there written procedure for tackling leakages in pipeline?	Yes, good engineering practices are there.	Yes	Complied
HANDLING OF HAZARDOUS SUBSTANCES				
249	What are the hazardous substances handled in the factory?	Phosphoric acid, Sulphuric acid and Ammonia.	PA/SA/NH3/Natural gas	Complied
250	Whether quantity of hazardous substances is above the threshold limit specified in the Manufacture, Storage and Handling of Hazardous Substances Rule, 1989? If yes, then required documentation is available as per the rule.		Ammonia is above Threshold quantity thus Qualifying as MAH . Here Rule 10(1) safety report becomes applicable which has been done .	Complied
251	Whether written procedure for handling the hazardous substance is available and operators are trained for handling such substances including actions required in case of leakages and spillages?		Yes , Detectors are also present in the storage yard	Complied
252	Are the employees aware of the hazards arising from hazardous substances and safety precautions to be taken during handling of these?		Yes , Operators and supervisors are not only trained for operation but also for all emergencies	Complied
MATERIAL SAFETY DATA SHEETS (MSDS)				

253	Are the material safety data sheets available for all the chemicals handled, used and manufactured in the factory?		Yes , prepared with 10 sections	Complied
254	Whether the latest MSDS are displayed at strategic locations?	MSDS sheets are not displayed prominently at respective locations.	Not displayed	Complied
255	Is it available in local language?	No	Yes , Do's and Donts	Complied
SPILL CONTROL MEASURES				
256	Whether spill control procedure is available?		Spill kit are used , Containment area near main scrubber Train A & B is available	Complied
257	Whether spill collection pit / sump is available at the workplace?		Yes	Complied
258	Whether methodology for recovery / disposal of collected material has been established?		Complete recycle to process of DAP manufacturing	Complied
STORAGE OF HAZARDOUS SUBSTANCES				
259	Whether storage vessels are identified with the capacity as required under MSIHC, Rules 1989.		Yes	Complied
260	What are the storage pressure and temperature?	Atmospheric pressure for all three major products. Ammonia is stored in double walled cylinder storage tanks at (-)33 Deg. C	1400 mm WC	Complied

261	Whether vessels are above ground / underground?	Above ground.	Vessels are above ground.	For information.
262	If any of the tanks storing flammable material, whether electrical equipment and fittings are as per electrical area classification?		Diesel yard has flammable fitting	Complied
263	Is the bunded area takes into account the total quantity of the largest tank?	Yes.	Caculations to be verified (For example Phosphoric acid)	Review Dyke area of PA
264	Whether the bund perimeter takes into consideration of trajectory of leak from tank?	Yes.	Yes	Complied
265	Are the vessels properly bonded and earthed and whether periodically checked and record maintained?		Yes, at least two earthing strips	Complied
266	Are the vessels fitted with remotely controlled isolation valves?	Not all.	Sample basis shows that Sulphric acid and Phosphric storage tanks are provided with manual isolation valves. Ammonia tank has Remote isolation valve	Complied
267	Are vessels provided with emergency vent, relief valve, bursting disc, level indicator, pressure gauge and overflow line?	Yes.	Yes. Equipmenst on sample basis have been found to be meeting the condition. (IA receiver, Ammonia storage, Sulphuric acid tanks etc.) , Ammonia Storage Has relief	Complied

			valve and vent connected to Flare	
268	Where such do vents discharge?		Ultimately to flare	Flare U loop to be water filled
269	Are the vessels provided with alarms for high level, high temperature and high pressure?		Yes , TWO LTS , 1 oo 2	Complied
270	Are standby empty tanks or any other alternate systems provided for emptying / transfer in case of emergencies?		There is no separate standby tank	Complied
271	What are the provisions made for fire- fighting / tackling emergency situations around the storage vessels?		All Ammonia storage tanks has got Remotely operated sprinkler system . The sprinkler cannot flood the top area of tank	Review pressure and flow of sprinkler water on Ammonia storages
272	Has any consequence analysis for loss of containment been carried out?		Yes , QRA has addressed Worst case scenario including pipeline leakage IDLH = 50 Km distance to wind	Complied
273	Whether the vessels are tested as per statute?		Yes , schedules are mentioned earlier	Complied
274	Whether log sheets are filled up on daily basis for recording the parameters of these vessels?		Logsheets are filled for DAP plant and Offsites	Complied
275	Whether monitors for detection of leakage of flammable / toxic material installed?		Yes , 33 ammonia monitors in the tank farm	Complied
276	Whether the chemicals stored are as per their compatibility?		Yes , the tank farms are separate	Complied

GAS CYLINDERS				
277	What are the various gas cylinders used in the plant?		Acetylene , LPG	Complied
278	Are valid licenses available for storing all these cylinders?		Minimum quantity Acetylene =2 LPG=5	Complied
279	Are the cylinders stored and segregated as per their compatibility?		Yes	Complied
280	What are the measures taken for combating any emergency in the cylinders storage area?		Dos and Dents are available	Complied
281	Whether integrity test certificates are obtained from the suppliers of the cylinders?		Cylinder test report not obtained .	To collect cylinder test certificate from Supplier
282	Are the cylinders chained and secured properly along with the valve caps and proper identification colour code?		Yes	Complied
283	Are the cylinders protected from heat or sun and rain?		Yes	Complied
284	Whether monitors for detection of leakage of flammable / toxic gas installed?		Yes for LPG , No for acetylene	May consider for acetylene storage
LABELING AND COLOR CODING				
285	Are all the containers, vessels and storage tanks labeled for its content and capacity?	Yes, vessels and tanks are as per colour coding standards.	Yes	Complied

286	Whether the pipelines are colour coded as per IS 2379?	Colour coding as per Coromandel standard based on IS2379.	Yes	Complied
287	Is any plant specific colour code followed?	As per standards only		Complied
288	Whether the color codes are displayed conspicuously in the working areas?	Yes displayed as specific locations.	Yes	Complied
HAZARDOUS WASTE MANAGEMENT				
289	Is identification done for various types of hazardous wastes?		No hazardous waste Generated by plant Except waste oil	Complied
290	Are these quantities less than those specified by the Hazardous Wastes (Management & Handling) Rules, 1989?		Yes , returns are available	Complied
291	What are their disposal modes?		To authorized recycler	Complied
292	What are the systems / measures adopted for controlling air / water / land pollution?		Water – recycle Air – Scrubber / fan Land – Dyke , Brick Lining	Complied
293	Whether the solid waste like combustibles, plastic, metals etc. segregated?		Yes	Complied
FIRE AND EXPLOSION HAZARD				
ORGANIZATIONAL SET-UP FOR FIRE FIGHTING				
294	What is the total strength of fire station and fire crew?		One fire station and Five crews	Complied

295	How many fire crews are available in each shift?		Each shift at least two Fire crews in each section	Complied
296	Is there fire squad identified in each shift?		Yes	Complied
297	Standing fire order is available with latest revision?		Yes , NOC of fire	Complied
298	How is the communication with fire station?		By walkie talkie / land phones	Complied
299	Does fire safety inspections carried out?		Yes	Complied
300	Does emergency procedure available for leakage or combustion of flammables?		Scenario Ammonia leakage Natural gas leakage	Complied
301	What measures are available to control the fire load in the plant area?		Sprinkler , Fire hydrants	Complied
302	Whether technical knowledge and skills of the manager and staff responsible for overall fire safety of the plant is adequate?		Fire officer having Diploma in Fire Safety and more than	Complied
303	How many major and minor incidents / fires were there in the factory during the last five years? Give department / plant wise.		None	Complied
304	Have all the fires / incidents been investigated and corrective actions taken? Give break-up.		Yes	Complied

305	Resources: 1) Adequacy of protective clothing (coat, trouser, gloves, boots and helmets); 2) Availability of SCBA for fire-fighting operations and spare cylinders (at least 2 for each SCBA) 3) Adequacy of hose, nozzles, ladders, lighting equipment and pumps; and 4) Communication facility at fire station, walkie talkie sets during fire-fighting.		1) Yes available at least ten sets 2) 2 SCBA 4 cylinders 3) Fire tender - one Foam and one 4) walkie talkie sets available	Complied
BUILT IN SAFETY IN CIVIL DESIGN AND CONSTRUCTION				
306	Whether the two safe means of escape available? Are they in separate directions?		Yes	Complied
307	Is emergency exits provided to the building handling flammables?		Emergency staircase for all ammonia tanks and in buildings	Complied
308	Whether emergency lights are provided?		Yes	Complied
309	Whether fire/ smoke detectors are installed in fire prone areas?		Yes	Complied
310	Whether fire call points are provided in different areas?		Yes	Complied

311	Whether Fire hydrants are provided near the buildings?		Yes	Complied
312	Is ventilation system in plant handling flammables is adequate to prevent formation of flammable mixtures?		Ventilation system for DAP plant for exhaust available	Complied
313	Is adequate separation is provided between combustible / flammable materials and other material to restrict the fire growth?		Yes	Complied
314	Access routes for firefighting operations is available for areas having high fire load?		Yes , Natural gas stations are in the ground floor and easily accessible	Complied
315	Whether building changes interferes with fire detection and / or fire suppression systems?		Not applicable	Complied
316	Whether building changes cause unreasonable fire loading / openings in the fire rated walls?		Not applicable	Complied
BUILT IN SAFETY IN ELECTRIC CIRCUITS AND EQUIPMENT				
317	Are the electrical equipment in areas where flammables mixture is likely to be present of flame-proof type?	Yes. electrical equipment in areas where flammables mixture is likely to be present of flame-proof type	Verified at site samples of electrical equipment in areas where flammables mixture is likely to be present of flame-proof type as per HAC	Complied
318	Are lightning arrestors are provided to the buildings / structures storing flammable materials?	LAS -Available lightning arrestors are provided to the buildings / structures storing flammable materials	Verified lightning arrestors which are provided to the buildings / structures	Note worthy: TP Study for LAS Provision made and implemented

			storing flammable materials	
319	Whether adequate bonding and grounding of electrical equipment / pipelines provided?	Yes, adequate bonding and grounding of electrical equipment / pipelines provided	Verified adequate bonding and grounding of electrical equipment / pipelines provided	Complied
EXPLOSIVE SUBSTANCES				
320	Whether necessary license / approval taken from concerned statutory bodies?	Yes. PESO Licenses obtained	Verified PESO Licenses	Complied
321	Whether systems for explosion suppression, high speed fire detection with deluge, sprinklers, explosion venting etc. are provided?	Fire suppression and Linear cable system is going to be commissioned Water Sprinklers,	Verified Fire suppression and Linear cable system is going to be commissioned Water Sprinklers,	Complied
322	Whether explosion resistant walls or barricades are provided around explosive storage?		Fencing with Barbed wire with two gates as per approved drawing	Complied
323	Whether explosive substance storage areas are restricted for entry?	Yes , under lock and key	Yes	Complied
324	Whether only trained persons are handling explosive substances?	Yes	Yes	Complied
325	Whether explosive substances are stored and transported in approved containers only?		Yes , in tank	Complied
326	Whether electrical fixtures in areas handling explosives are explosion proof type?		Yes	Complied

327	Whether adequate measures are taken to prevent any sources of ignition where explosive substances are handled?		Yes , vent with FA	Complied
FIRE SAFETY IN HANDLING FLAMMABLE AND EXPLOSIVE MATERIALS				
328	Whether emergency procedure is available for control of leakage?	Yes, emergency procedure is available for control of leakage	Witnessed demonstration at site by ERT Members.	Complied
329	Whether emergency measures are displayed locally in case of accidental spillage / leakage?	Yes, emergency measures are displayed locally for accidental spills and leaks.	During site rounds seen the displayed information emergency measures and accidental spills and leaks.	Complied
330	Whether facility is provided for safe drainage of combustible or flammable liquids in case of leakages?	Yes, facility is provided for safe drainage of combustible or flammable liquids in case of leakages	During site visit ,witnessed facility provided for safe drainage of combustible or flammable liquids in case of leakages	Complied
331	Whether highly flammable liquids are stored under inert atmosphere?	Except Diesel there is no storage and requirement of highly flammable liquids	Verified Diesel storage during site visit including filling station.	Complied
332	Whether flammable storage tanks are provided with flame arrestors?	N.A	N.A	Complied
333	Whether suitable PPE's are provided?	Yes, suitable PPE's are provided at all required location as per OSEP.	Verified provision of PPE's at all required location as per OSEP. Verified the suitability expiry and condition of all PPE's	Complied
FIRE DETECTION AND ALARM SYSTEM				

334	What type of fire detection and alarm system provided?	*Yes, Smoke detection system & Heat detection system is in place	Verified SDS & HDS in plant and canteen	Complied
335	Whether all fire prone areas of the plant are covered with fire detection system?	Yes, all fire prone areas of the plant are covered with fire detection system	Visited plant and witnessed location of fire detection system	Complied
336	Whether fire detection equipment and smoke alarms in good operating condition?	Yes, fire detection equipment and smoke alarms in good operating condition	fire detection equipment and smoke alarms are checked quarterly by Third party-Honeywell	Complied
337	Whether the numbers of fire call points are adequate and free from obstruction?	Yes, the numbers of fire call points are adequate and free from obstruction in plant administration, Technical building, QA lab and canteen/	Verified the number of fire call points and observed that they are free from obstruction in plant administration, Technical building, QA lab and canteen	Complied
338	Whether regular inspection / maintenance / testing of fire detection and alarm system carried out and records maintained	Yes monthly inspection / maintenance / testing of fire detection and alarm system carried out and records maintained	Verified documented information of inspection / maintenance / testing of fire detection and alarms	Complied
339	Whether any atmospheric monitoring is carried out for explosive mixture of gases or vapours?	DETECTORS FOR ATMOSPHERIC MONITORING OF AMMONIA is the practice	Witnessed Ammonia detectors and site and its maintenance records at site	Complied
340	Whether emergency power supplies are provided to fire detection and fire alarm system?	Yes, emergency power supplies are provided to fire detection and fire alarm system	During site visit observed provision of UPS systems at 13 required places.	Complied

341	Whether smoke detectors are located considering ventilation pattern?	Yes, smoke detectors are located considering ventilation pattern	Witnessed ventilation pattern with supplied air diffusers and return air diffusers	Complied
342	Whether annunciation of fire is local or in the control room or in both places?	Yes, a total number of 13 annunciation panels of fire are located in plant	*13 annunciation panels of fire are located in plant * Message alert and autodial system is also in place	Complied
343	Whether fire panel is constantly attended?	Yes, 13 fire panels are installed and constantly monitored 24x7	Verified 13 fire panels at plant location including buildings	Complied
PASSIVE AND ACTIVE FIRE PROTECTION SYSTEM				
344	What are the passive fire protection measures available? (Barriers, Doors, Dampers etc.)	Yes, Electrical panel rooms -MCC &PCC are provided with fire walls and fire doors.	Visited Electrical panel rooms (MCC &PCC) and ensured provision of fire walls and fire doors	Complied
345	Are the areas requiring fire barriers identified?	As in point N0.344	As in point N0.344	Complied
346	Whether the fire barrier provided is of adequate ratings?	Yes, fire barrier provided are of adequate ratings	Verified rating documents of fire barrier provided	Complied
347	Whether ventilation ducts in flammable areas have been provided with isolation dampers of suitable fire rating?	Yes, ventilation ducts in flammable areas have been provided with isolation dampers of suitable fire rating	Verified rating documents of ventilation ducts with dampers in flammable areas	Complied
348	Whether sprinklers / deluge are installed wherever necessary?	Yes, deluge and water curtains are installed as follows: Ammonia Tanks and MRSS - 132KV SS and A&B Trains	Verified at site : Deluge and water curtains are installed as follows: Ammonia Tanks and MRSS - 132KV SS and A&B Trains	Complied
349	Whether regular inspection /		Verified documentary evidence of Monthly	Complied

	maintenance / testing of fire protection system carried out and records maintained?	Yes, regular inspection / maintenance / testing of fire protection system carried out and records maintained	inspection / maintenance / testing of fire protection system carried out and records maintained	
FIXED FIRE EXTINGUISHING SYSTEM				
350	What are the sources of firewater and whether they are dedicated to the fire extinguishing system?	Yes, the sources of firewater is from Reservoir of 2700 KL	Site Verification of firewater Reservoir of 2700 KL	Complied
351	Whether the capacity of dedicated water reservoir is adequate to supply to hydrants for minimum 2 h?	Yes, as per engineering calculations water reservoir is adequate to supply to hydrants for minimum 2 hours	Visited and verified water reservoir and its adequacy to supply to hydrants for minimum 2 hours	Complied
352	Whether un-interrupted power supply is provided to the firewater pumps?	Yes, un-interrupted power supply is provided to the firewater pumps	Verified at site Diesel Generator: 273 cubic meter	Complied
353	Whether the extinguishing medium selected is appropriate to the class of fire (water, gaseous, foam, and dry powder)?	Yes, extinguishing medium selected is appropriate to the class of fire (water, gaseous, foam, and dry powder)	Water FE'S: 6 Nos AFFF: 6 Nos ABC: 256 Nos CO2: 258 Nos	Complied
354	Whether fire hydrants layout is available?	Yes, fire hydrants layout is available	Verified fire hydrants layout is available	Complied
355	Whether additional (over minimum requirement) fire hoses, nozzles are available?	Yes, 100 Fire extinguishers are made available in addition to the requirement (over minimum requirement) fire hoses) Jet Nozzles: 100	Yes, 100 Fire extinguishers are made available in addition to the requirement (over minimum requirement) fire hoses) Jet Nozzles:100	Complied

356	Whether the hydrants lines are kept pressurized?	Yes, the hydrants lines are kept pressurized@ 7 bar	Verified, the hydrants lines are kept pressurized@ 7 bar	Complied
357	Whether regular inspection / maintenance / testing of fixed fire extinguishing systems carried out and records maintained?	Yes Monthly inspection / maintenance / testing of fixed fire extinguishing systems carried out and records maintained.	Verified: Monthly inspection / maintenance / testing of fixed fire extinguishing systems carried out and records maintained.	Complied
PORTABLE FIRE EXTINGUISHING SYSTEM				
358	Whether suitable type and numbers of fire extinguishers provided?	Yes, Water FE'S: 6 Nos AFFF: 6 Nos ABC: 256 Nos CO2: 258 Nos	Verified: Water FE'S: 6 Nos AFFF: 6 Nos ABC: 256 Nos CO2: 258 Nos	Complied
359	Whether the fire extinguishers are located at conspicuous position and easily accessible? Are they fully charged and tagged?	Yes. Fire extinguishers are located at conspicuous position and easily accessible? Are they fully charged and tagged	Verified the fire extinguishers at locations and positioning and accessibility? Are they fully charged and tagged	Complied
360	Whether fire extinguishers periodically inspected, tested, refilled and records maintained?	Yes, Monthly extinguishers inspected. Tested once in 5years refilled and recorded as per schedule and on need basis	Verified schedule: Monthly extinguishers inspection. Test records of refilling.	Complied
361	Whether defective / unchecked fire extinguishers present at site?	No defective / unchecked fire extinguishers present at site	Verified physically at site that No defective / unchecked fire extinguishers present at site	Complied
362	Whether additional fire extinguishers are available?	Yes .100 Fire extinguishers are additionally available	Verified .100 Fire extinguishers are additionally available	Complied
FIRE FIGHTING EQUIPMENT AND FACILITIES				

363	Whether fire tenders (water / foam) are available?	<p>Yes, two fire tenders (water / foam) are available</p> <p>Trailer Pump;</p> <p>Newage, 1800 Lpm</p> <p>Fire Pump#1</p> <p>KIRLOSKAR</p> <p>Fire Pump#2</p> <p>KIRLOSKAR</p> <p>Diesel Pump</p> <p>Kirloskar</p> <p>.</p>	<p>Two fire tenders (water / foam) are available:</p> <p>1.AP05V 00 151:</p> <p>Water 4000Lts, Foam: 500 LTS</p> <p>2.AP39UL 9984</p> <p>Water 5000Lts, Foam: 1000 LTS</p> <p>**Pollution certificates, fitness certificates, Insurance policy are valid.</p>	Complied
364	Whether the fire-fighting system and equipment approved, tested and maintained as per relevant standard?	Yes. Fire fighting systems are provided (Semi fixed)	<p>Sprinkler rings with remote control are provided for ammonia storage tanks.</p> <p>Ammonia compressors and pumps are provided with spray nozzles.</p>	Complied
365	Whether the SCBA / fire suit provided to firefighting team for immediate action?	Yes. SCBA sets are available.	<p>SCBA sets and cascading systems are available for meeting any situation effectively. It was demonstrated by giving the task to the operating staff and did very nicely. Verified availability of 34 SCBA and 4 fire suites provided for firefighting team for immediate action?</p>	Complied.

366	What is system for maintenance / recharge of SCBA?	Yes. Drager is the TP system for maintenance / recharge of SCBA	Verified contract documents of Drager - the TP system contractor for maintenance / recharge of SCBA	Complied.
367	Is proper access available for firefighting equipment?	Yes. access made available for firefighting equipment	Verified. Markings and access made available for firefighting equipment	Complied.
368	Whether fire hose cabinets are in good condition, easily visible, and accessible?	Yes. Fire hose cabinets are in good condition, easily visible, and accessible	Verified Fire hose cabinets are in good condition, easily visible, and accessible	Complied
369	Whether drill tower is available? Are fire personnel carrying out regular fire drill?	No Drill Tower Regular drills are conducted as per schedule.	Verified the documents of Fire drills	Complied
370	What is the communication facility at fire station? Is it adequate?	Yes. communication facility at fire station is as follows: Fire siren Global paging system (Public address system) Mobile alert Yes it is adequate	Witnessed And verified at site	Complied
FIRE DRILL				
371	Whether mock fire drills are conducted? What is the frequency of drills?	Yes. Mock fire drills are conducted once in 3 months Participated in the Off-site drill on 23/02.2023.	Verified: Documents of fire drills are conducted once in 3 months Participated in the Off-site drill on 23/02/.2023	Complied

372	Whether fire drills are also performed in night shift?	Yes, fire drills are also performed in night shift.	Verified night shift drill documents	Complied
373	Whether feedback of fire drill is documented?	Yes. feedback of fire drill is documented	Verified documentary evidence on feedback of fire drill is documented	Complied
374	What is the system of mutual-aid scheme?	YES, With Neighbouring companies: NFCL and Spectrum Power	Verified documents of Mutual Aid Agreement.	Complied
FIRE FIGHTING TRAINING				
375	Whether there is a system of providing fire-fighting training to plant personnel?	Yes, there is a system of providing fire-fighting training to plant personnel	Verified internal document of monthly training schedule	Complied
376	What is the frequency and duration of such training? Whether training records are maintained?	Yes there is a system of providing fire-fighting training to plant personnel	Verified documents on fire-fighting training to plant personnel	Complied
377	Whether fire squads are identified for different areas for first-aid firefighting and rescue, and suitably trained?	Yes, fire squads are identified for different areas for first-aid firefighting and rescue, and all are suitably trained and on the roles of ERT Team	Verified documents on fire squads are identified for different areas for first-aid firefighting and rescue, and all are suitably trained and on the roles of ERT Team	Complied
378	Are all personnel conversant with the fire prevention and protection measures?	Yes, all personnel conversant with the fire prevention and	Verified all relevant documents	Complied
379	Whether the fire staff are sent for refresher/ advanced training courses?	Yes. fire staff are sent for APFS advanced training courses	Verified documentary evidence of fire staff training by APFS & civil defense advanced training courses	Complied

STATIC ELECTRICITY AND LIGHTNING				
380	Whether all vessels and pipes are provided with suitable bonding and grounding?	Yes. all vessels and pipes are provided with suitable bonding and grounding	Verified vessels and pipes are provided with suitable bonding and grounding	Complied
381	Whether arrangement has been made for grounding the tanker containing flammable liquid during loading / unloading?	Do	Do	Complied
382	Whether spark resistant tools are provided?	Yes. Spark resistant tools are in use	Checked condition of Spark resistant tools and are in good operable condition	Complied
383	Whether lightning protection is provided and is adequate?	Yes. lightning protection is provided and is adequate	Witnessed at field lightning protection is provided and is adequate A study and report of suggestions by CAPE Electrical -TP are implemented in Jan 2023	Complied
384	Whether antistatic clothing, hand gloves and footwear are provided?	Yes. No antistatic clothing, Hand gloves and footwear are provided	During plant visit Checked hand gloves and footwear of working team	Complied
PRESSURE RELIEF SYSTEM				
385	Whether the listing of all 'pressure plants' [as defined under Factories Act] has been done?	Yes, pressure vessels are inspected as per AP Factories act.	Rule 10.11	Complied
INDUSTRIAL HYGIENE / OCCUPATIONAL HEALTH				
VENTILATION				

386	Whether any ventilation study has been carried out?		Presently , Ventilation study by Sure Safety is under progress . Air borne , Toxicity etc is under scope	Complied
387	Whether natural ventilation is adequate or not?		Already aided by air blowers in DAP Trains	Complied
388	Whether dust / fumes / hot air is generated in the process?		Yes , dust is generated	Complied
389	Is there any exhaust ventilation system in any section of the plant?		Yes , air blower	Complied
390	Is periodic / preventive maintenance of ventilation system carried out and record is maintained?		Yes and Interlock exists with plant operation	Complied
391	Does any ventilation system re-circulate the exhausted air in work areas?		No	Complied
392	Is the work environment assessed and monitored for chemical and physical hazards?		The study will be on.	Complied
393	Whether PPE are provided to workers exposed to dust / fumes and gases?		Yes	Complied
ILLUMINATION				
394	Whether illumination study has been carried out for the assessment of illumination level?	Illumination checks and records are in place	Verified Illumination check records are in place	Complied

395	Is there any system of periodical cleaning and replacing the light fittings / lamps in order to ensure that they give the intended illumination levels?	Yes. Cleaning of light fittings and replacement of fused bulbs are in place	Cleaning of light fittings and replacement of fused bulbs are in place	Complied
396	Are the workers subject to periodic optometry tests and records maintained?	Yes. workers subject to periodic optometry tests and records maintained	Verified workers subject to periodic optometry tests and records maintained	Complied
397	Are emergency lighting available at first aid center?	First Aid /OHC Emergency lighting is available	Verified First Aid /OHC Emergency lighting is available	Complied
NOISE				
398	Whether any noise study conducted?		Yes , noise Level is Checked	Complied
399	Are there any machines / processes generating high-noise?	Yes. Instrument air/ Service air compressors are high noise machines.	Nosie levels was checked from records. It was around 94-95 dBA. Ear muffs are advised before the operators visit the area. There are 14 areas across the plant identified where noise level is more than 85 dBA.	Complied
400	Whether engineering and administrative controls been implemented to reduce noise exposure below the permissible limits?	Yes. Enclosures have been provided at compressors. Ear muffs are to be used in High Noise areas.	Yes. Enclosures have been provided at compressors. Ear muffs are to be used in High Noise areas.	Recommended to use PPE.
401	Is there a system of subjecting all those employees to periodic audiometric test who		Audiometry tests are carried out alongwith periodic medical exam	Complied

	work in high-level noise areas?			
402	Whether the workers are made aware of the ill effects of high noise?		Yes. Workers have been instructed to use ear muffs before approaching High NOISE areas.	Complied
403	Whether ear muffs / plugs are provided and used?	Yes.	Ear muffs are provided	Complied
VIBRATION				
404	Are there equipment which contributes excess level of vibrations and whether they are identified?	Vibration of rotary equipment is being done as per our CBM schedule	Large blowers in ABC trains are observed for vibration	Complied
405	Whether any vibration study has been carried out?	Done with external party for building vibrations.	Yes	Complied
406	Are the measures taken to combat vibration to acceptable levels?	Yes.	Yes	Complied
407	What is the frequency for measurements of vibration?	Weekly and Monthly based on severity.	Monthly records are available	Complied
408	Are the records of measurements and maintenance of equipment / system maintained?	Yes, maintained.	Yes	Complied
HEAT STRESS / COLD STRESS				
409	Are there sources from equipment increasing the heat load in work places?		Drier area and gas heating area is hot area , but it is also unmanned	Complied
410	Whether evaluation of heat stress is carried out?		Boiler operator takes round and relatively less exposed to heat	Complied

411	Whether natural ventilation is adequate to minimize the heat stress in work environment?		Yes	Complied
412	Are resources available to deal with very hot or very cold conditions (drinking water, lined gloves, insulated boots)?		Yes	Complied
413	Do workers know the symptoms of heat cramps / heatstroke or frost bite/ hypothermia?		Heatstroke during Summer is known to workers for the symptoms	Complied
414	Are the personal protective equipment suitable for reducing the effects of heat stress available?		Normal PPE is used , heat resistant gloves are used	Complied
NON-IONIZING RADIATION				
415	Does the work involve likely exposure to non-ionizing radiations (ultraviolet, infrared, radiofrequency, microwaves, lasers, etc?)		Not applicable	Complied
416	Whether risk assessment has been done for all work areas involving presence of non-ionising radiations?		Not applicable	Complied
417	Are the work areas displayed with relevant safety signs?		Not applicable	Complied
418	Are the employees aware about the			Complied

	hazards of non-ionising radiations?			
419	Does a written procedure exist for working in non-ionising radiations?		Not applicable	Complied
420	Is the work environment monitored periodically for physical hazards and control measures initiated whenever deviation from permissible values is observed?		Not applicable	Complied
421	Whether suitable personal protective equipment are provided to workers exposed to non-ionising radiations?		Not applicable	Complied
WORK PLACE MONITORING FOR HAZARDOUS CHEMICALS				
422	Whether the dust, fumes, smoke aerosols and mist are monitored as per statute and records maintained?		Periodical monitoring is done	Complied
423	What are the types of detectors used for monitoring concentration of hazardous chemicals?		Ammonia	Complied
424	Is any alarm system installed for any leakage of hazardous chemicals?		Yes set at 10% of TLV	Complied
425	Are antidotes available for toxic chemicals?		Yes	Complied
426	Are control measures initiated whenever deviation from		Yes , including instrumentation	Complied

	permissible values is observed?		Controls and interlocks	
FIRST AID FACILITIES AND OCCUPATIONAL HEALTH CENTRE (OHC)				
427	Are adequate numbers of first aid boxes provided? Give location details?	Yes.	Available with every department and control rooms	Complied
428	Are qualified / trained first aiders available in each shift?	Yes. They are provided regular training.	Yes	Complied
429	How many qualified / trained first-aiders are available at each plant / department?	Total 81 numbers	Each section will have more than two	Complied
430	How many persons are trained / given refresher training in first aid in a year?	Almost every one	40 - (2021-22)	Complied
431	Whether occupational health centre is provided?	Yes	Yes	Complied
432	Does OHC conform to the provisions of the existing statutes?	Yes	Yes , as per APfactories Rules	Complied
433	Are the Medical Attendants / Doctors available in each shift?	During General shift and Paramedical staff in each shift	One doctor and three medical attendant (Male nurses)	Complied
434	What facilities are available for transportation of the injured to hospital?	Ambulance (24 by 7) and Stretchers are available	Ambulance - two nos at least One available 24X7with Driver	Complied
435	Are the names of the trained first aiders displayed?	Yes, 81 numbers.	Yes, 81 numbers. List is updated regularly and available at OHC and ECC	Complied
436	Are the name of nearest hospitals and its telephone number available in OHC?		Yes	Complied

437	Does the plant have any special preventive medicine program?			Complied
438	Is ambulance posted in proper place and is it available whenever required?	Yes.	Yes, In OHC	Complied
439	Are sufficient numbers of anti-dotes available in case of any emergency?	Yes	Yes , snake antidotes are available	Complied
440	Are fire safety measures provided in first aid centre?	Yes	Yes , smoke detectors are available	Complied
441	Are emergency lighting arrangements available at first aid centre?	Yes.	Yes , emergency power available through DG set	Complied
PERIODIC MEDICAL EXAMINATION				
442	Whether the periodical medical examination of employees, required under relevant statute is carried out?	Yes	Yes , for every selected employee	Complied
443	Whether it is ensured that contractors employee are medically examined during pre-employment as well as during the course of employment?	Yes.	Yes. Entry permission is provided after that only.	Complied
444	During the periodical medical examination of the workers, are they examined as per the hazardous process in which they work? (First schedule of The Factories Act, 1948)	Yes.	Yes. Bagging plant personnel are checked for respiratory system in particular.	Complied

445	Are the records of all such examination maintained?	Yes	Yes	Complied
PERSONAL PROTECTIVE EQUIPMENT AND EMERGENCY EQUIPMENT				
446	Whether list of required PPE for each hazardous activity is available?	Yes	Ammonia - Breathing air set Acid - acid / alkali proof gloves , Chemical suit , Canisters for Ammonia service	Complied
447	Whether feedback from workers obtained during selection of PPE?	Yes	The workers adhere to wearing of PPE	Complied
448	Have the workers been trained in proper use of PPE including BA sets?	Yes	Yes . Quick wearing of BA set	Complied
449	What is the system of procurement, inspection, issue, maintenance and replacement of PPE?	Fire & Safety department in coordination with Plants and Procurement department	As per procedure	Complied
450	Whether qualitative and quantitative fit-check for respirators is ensured prior to use?	Yes	Respirators are used before expiry and one time use	Complied
451	What are the arrangements for safe custody and storage of PPE?	Yes	Kept in department . Stock is replenished	Complied
452	Are the contractor's workers provided with the required PPE?	Yes	The Contractor provides for their own workmen	Complied
453	Do the PPE conform to any standard?	Yes	As per IS	Complied

454	Are sufficient eye wash fountains and safety showers available?	Yes	Yes , they are positioned close to chemical handling , PA /SA tank farm	Complied
455	Whether appropriate respiratory protective devices are available in accordance to the hazard potential?	Yes	Yes , for ammonia , respirators are available	Complied
456	Are the staff members trained in the right uses of respiratory protective devices?	Yes	Yes	Complied
OCCUPATIONAL DISEASES				
457	Whether pre-employment medical checkup data available?	Yes	Yes including audiometry and eye check up	Complied
458	During the medical checkup, is any person found having occupational diseases mentioned in 3rd schedule of The Factories Act, 1948?	No	None reported	Complied
459	Whether the medical practitioner informed the Chief Inspector of Factories about the occurrence of the occupational disease?	NA	Aware of the Practice	Complied
ACCIDENT / INCIDENT REPORTING, INVESTIGATION AND ANALYSIS				
ACCIDENT REPORTING AND DATABASE MANAGEMENT				
460	What is the procedure for accident/ incident / dangerous occurrence reporting?	Yes. On line system exists.	On line reporting in My Setu software	Complied
461	Whether the accident data for the last five years for reportable and	Yes	Last reportable incident : Dec 16 , 2021	Complied

	non-reportable accidents are available?			
ACCIDENT INVESTIGATION				
462	Are all the accidents investigated?	Yes	Yes , Without delay	Complied
463	Whether accident investigation procedure is documented?	Yes	Yes , The reporting is On line	Complied
464	Whether accident investigation reports are submitted to top management?	Yes	Yes	Complied
465	How are the findings from accident investigation reports communicate to workers?		By Safety committee and tool box talks (Pep Talks)	Complied
ANALYSIS OF ACCIDENTS				
466	Whether accident analysis is done as per IS 3786?	Yes	On this date , 5 Million manhours accident Free days achieved	Complied
467	Whether root causes of accidents are analysed?	Yes.	Yes. Committee is put up.	Complied
468	Is the accident statistics effectively utilized? If yes, how?	Yes.	Displayed in front of gate	Complied
469	What nature of injuries occurred during the last five years?	First aid, Reportable, Minor injuries	1)Spillage of Chemicals / Acid 2) Mechanical type	Complied
IMPLEMENTATION OF RECOMMENDATIONS				
470	How does the management ensure implementation of the recommendations to avoid recurrence of	Yes	1) Time bound action plan 2) Management review	Complied

	accidents and incidents?			
REPORTING AND INVESTIGATION OF NEAR-MISS INCIDENTS				
471	Are all near-miss incidents reported and investigated?	Yes	Near miss incident reporting is few. Needs to be encouraged more.	Complied
472	Is there any system of classifying and analyzing the near-miss incidents?	Yes	Classified as per Hazards	Complied
EMERGENCY PREPAREDNESS				
SITE SPECIFIC DETAILS				
473	Are the site area maps (including layout, access roads and assembly points) available in control room / emergency control centre?	Yes	Yes , ECC is near east gate	Complied
DUTIES AND RESPONSIBILITIES OF KEY PERSONNEL				
474	Is the hierarchy of emergency response personnel right from site emergency controller downward?	Yes	Yes, mentioned in DMP	Complied
475	Are the duties and responsibilities assigned to the designated officials during emergency?	Yes	Yes , clear cut responsibility	Complied
IDENTIFICATION OF EMERGENCIES AND ACCIDENT SCENARIO				
476	Are the possible accident scenarios leading to emergency identified and known to the operating personnel?	Yes	It is identified in On site emergency plan. 14 scenarios have been identified.	Complied

477	Are approved emergency preparedness plans (on-site and off-site) in place?	Yes	Yes , available in ECC	Complied
DECLARATION AND TERMINATION OF EMERGENCY				
478	Is the list of designated officials who are to be communicated about declaration and termination of emergency available in the control room / emergency control center?	Yes	Yes. List is displayed also at ECC	Complied
479	Are the methods of communication (siren, public address system etc.) for declaration and termination of an emergency known to all the workers?	Yes	Yes, Siren, PA address system and Wi fi sets are available for necessary communication and known to the working staff .	Complied
RESOURCES-EVACUATION / TRANSPORT				
480	Are the following resources (equipment, personnel and procedures) required handle emergency available? 1. Communications, 2. Public announcement systems 3. Monitoring of hazardous releases into the environment, 4. Emergency shelters at the facility, 5. Emergency exits with proper illumination,	1.	1) Communication in Charge designated as HR , otherwise Incident Controller as Communication in Charge 2) PA system active 3) Detectors and Indicating system , Wind socks at noted places 4) Emergency assembly area near storages 5) Emergency exits from control rooms , all control rooms	Complied

	with uninterrupted power supply, 6. Direction for emergency exit / escape route marked in haulage / Alleyways, 7. Transport for evacuation of plant personnel, 8. Medical care including administration of antidotes, 9. Security / maintenance of law and order.		available with Emergency power , emergency equipment 6) Yes 8) available 9) Available	
COMMUNICATION FACILITIES				
481	Does the emergency control centre have direct communication links with the fire station and the plant control room?		Yes	Complied
482	Are there adequate alarm points from which an emergency alarm can be raised?		Yes and call points	Complied
483	Is there infrastructure available for ensuring backup electric power supply for communication links where required?		Yes	Complied
MEDICAL CARE				
484	Is the procedure for emergency medical care available?	Yes. procedure for emergency medical care available	Visited Occupational Health Centre: *OHC is headed by chief medical officer	Complied

			*OHC Team works 24x7 with the support of 4 paramedical team members	
485	Whether the system has been tested at regular frequency through mock drill / exercises for its adequacy?	Yes, OHC Team participates in the mock drill / exercises during the OSEP Fire and evacuation drills once in 3 months	Visited OHC and verified the documents. Mock drill records of 2022 & Feb 2023	Suggest to improvise with different scenarios- Ammonia leak Exercise, Phosphoric Acid leak exercise
486	Does the system of periodic replacement of antidotes and medicines required in emergency exist?	Yes. system for procurement of antidotes and of periodic replacement of antidotes based on the expiry and shelf life is the practice	Visited OHC and verified the documents: Antidotes	Complied
UPDATION OF EMERGENCY PLAN				
487	Is the emergency plan updated based on the feedback from the periodic drills / exercises?		Yes	Complied
488	Are the contact details of all concerned officials kept updated in the emergency plan?		Yes	Complied
PERIODIC DRILLS / EXERCISES				
489	Are mock-exercises conducted at stipulated intervals?		Last conducted 23 rd Feb 2023	Complied
490	Are the scenarios varied in the mock-exercises to ensure that all possible factors including meteorological conditions, affected plant personnel covered?		The said mock drill scenario : Ammonia D tank outlet immediate upstream flang leakage	Complied

491	Whether emergency preparedness Plans have been tested and reviewed at regular frequency through mock drill for its adequacy		Yes	Complied
TRAINING OF PLANT PERSONNEL				
492	Are the plant personnel trained in handling emergency equipment?		Yes	Complied
PUBLIC AWARENESS PROGRAMMES				
493	Are public awareness programs conducted for the people around the site regarding the actions to be taken in case of off-site emergency?			Complied
MUTUAL-AID PROGRAMME				
494	Are the types of accidents where external organizations would be involved in remedial actions identified? Are their responsibilities defined?		Mutual aid exists with Nearby Fertilizer Company and also port area	Complied
495	Is the plant responsible for rendering mutual aid assistance to any other external organizations? Does this assistance affect the plant's emergency preparedness?		Yes , Fire tenders are a resource	Complied
496	Whether the communication channels for mutual assistance identified		Yes	Complied

	and known with and between two organizations?			
EMERGENCY CONTROL CENTRE				
497	Is the emergency control centre located beyond the effective distances of identified emergency scenarios?	Yes. Emergency control centre located within the plant and at a safe locate as per OSEP and prevailing wind direction.	Visited OHC and seen the documents and is in line with disaster management norms and Director of factories.	Complied
498	If the emergency control centre is located within the effect distance, is it suitably protected that it will be available in case of emergency?	Yes. Emergency control centre located within the plant and at a safe locate as per OSEP and prevailing wind direction.	Visited OHC and seen the documents and is in line with disaster management norms and Director of factories.	Complied
SAFETY INSPECTION				
INSPECTION PROGRAMME				
499	Are checklists available for inspections? For example availability of checklists like: a) Handling, Storage and Transportation of hazardous chemicals; b) Electrical hazards; c) Fire safety; d) Hand and portable power tools; e) Machine hazards; f) Lifting equipment; g) Ladders and scaffolding; h) Environmental Monitoring;		The following checklists evidenced For inspection : 1) Unloading of Chemicals from Jetty by pipeline 2) Unloading of tankers 3) Permit to work (also on Line) 4) Lifting equipment (Form 10/11) 5) Scaffolding 6) Fire fighting equipment inspection Checklist	Complied

	j) Civil structure; k) Housekeeping; m) Emergency equipment; and n) Gas cylinder and other pressure vessels used / available in the organization.		7) Housekeeping checklist	
SAFETY RELATED DEFICIENCY (SRD) REPORT				
500	Are SRDs generated based on the area wise checklists?		Presently , do not have formalized Report .	Complied
501	What is the procedure for resolving the SRDs?		Linking OHS and Process safety indicator is also being done	Complied
502	Whether the procedure exists for notification and root cause analysis of non- conformities and action taken on them?		For process safety, all Tier 3 and Tier 4 Incidents are analysed for their root causes .	Complied
SAFETY INSPECTION RECORDS				
503	Are the safety inspection records maintained?		Yes	Complied
METHODOLOGY AND INSPECTION TEAM				
504	Is there written procedure for safety inspection?		Yes	Complied
505	Whether safety inspection is carried out by a designated team?		Yes , Internal safety audit is also available	Complied

506	What is the frequency of safety inspections?		Monthly , For audit it is yearly	Complied
507	Whether an inspection report is generated?		Yes	Complied
COMPLIANCE OF RECOMMENDATIONS				
508	To whom the recommendations are submitted		Operation HOD	Complied
509	Are recommendations of safety inspections complied in time?		Yes	Complied
510	Is compliance of recommendations sent to top management?		PSMS Review meeting reviews the Compliances	Complied
511	Is compliance of recommendations reviewed by safety committee?		Yes , informed	Complied
512	Does top management follows-up the compliance?		EHS dept follows Up the Compliance	Complied

3.2 REGULATORY COMPLAINE

- Legal compliance has been observed while checking the documents. Factory license No. 43857 for 20000 HP/14920 KW and 2000 manpower is under renewal (31/12/22). Till then, license Certificate has been obtained from statutory authorities for year 2023.
- Another Consent to operate from the Pollution board bearing APPCB CTO APPPCB/VSP/RJY/ 285/HO/CFO/2021 dated 1/10/2021 is valid till 30/9/2026.

END OF THE REPORT