VISAKHAPATNAM PORT AUTHORITY
TRAFFIC DEPARTMENT
***

No: ITRA/SHP/FAMN

Dt: 24 -01-2023.

TRADE CIRCULAR - 1561

Sub: Latest directions of APPCB in connection with handling and transportation of Ammonium Nitrate-Restrictions on import of Ammonium Nitrate into Visakhapatnam Port and storage at Visakhapatnam-Directions-Issued- Reg.
Ref: APPCB Letter No: 724/APPCB/HO/ERM/TF/VSP/2023, Dt: 17.01.2023.
***

It is for information of the concerned stakeholders that the Environment, Forest, Science & Technology (EFS&T Dept.), Govt. of AP had constituted a Committee on 20.07.2022 to examine the whole issue of import and handling of Ammonium Nitrate at Visakhapatnam Port in detail and to submit a report to the Government to find a solution.

The said Committee had since submitted its report on 03.11.2022 and after careful examination of the said report, the Government has issued certain directions to APPCB wherein, APPCB vide letter cited have issued the following guidelines for strict compliance by all importers, stevedores and stakeholders concerned:

1. To comply with the recommendations made by the Safety Audit Team of DGFASLI (during a recent audit of Ammonium Nitrate handling in VPA) at para -10, pages 43-55 (field observations and recommendations) of the Safety Audit Report and certified by Dock Safety Inspectorate. .PDF Copy of the Audit Report of DGFASLI is enclosed.
2. Strict compliance of Ammonium Nitrate Rules, 2012 under the supervision of PESO and Dock Safety Inspectorate.
3. Compliance of modalities and SOPs framed by VPA to be complied by concerned importers and Stevedores.
4. Strict compliance of the conditions stipulated by the District Magistrate/ Commissioner of Police from time to time.
5. To handle Ammonium Nitrate at Visakhapatnam Port for a period of 3 months duly following the present procedure of unloading of Ammonium Nitrate cargo from the ship to the wharf and direct loading on to containers or trucks for onward transportation to the final destination by the railways / lorries, subject to condition that the stake holders shall follow all the prescribed safety protocols of Petroleum and Explosives Safety Organization (PESO). APPCB & Director of Factories. The whole operations shall be carried out under the supervision of PESO, duly following the safety measures and incompliance with Ammonium Nitrate Rules and SOPs suggested by PESO. There shall be no storage of Ammonium Nitrate in any godown at Visakhapatnam Port or in the Visakhapatnam city.

In terms of the directions as aforesaid, and any contraventions to the above, APPCB will be constrained to initiate further action including imposition of Environment compensation under the provisions of the Environmental laws.

The concerned importers/ stevedores engaged in handling in Ammonium Nitrate will be liable to compensate VPA in the event of any lapses/non-compliances on the their part during import, discharge, delivery and subsequent transportation of the cargo from the port and consequent imposition of environmental compensation (if any) by APPCB for such lapses/non-compliances.

In light of the above development, the concerned importer will be required to furnish unconditional under taking on vessel-to-vessel basis to VPA towards compliance of all the aforesaid stipulated directions of APPCB prior to seeking berthing of their vessels in port.

The above directions are issued with the approval of Competent Authority and will be effected immediately.

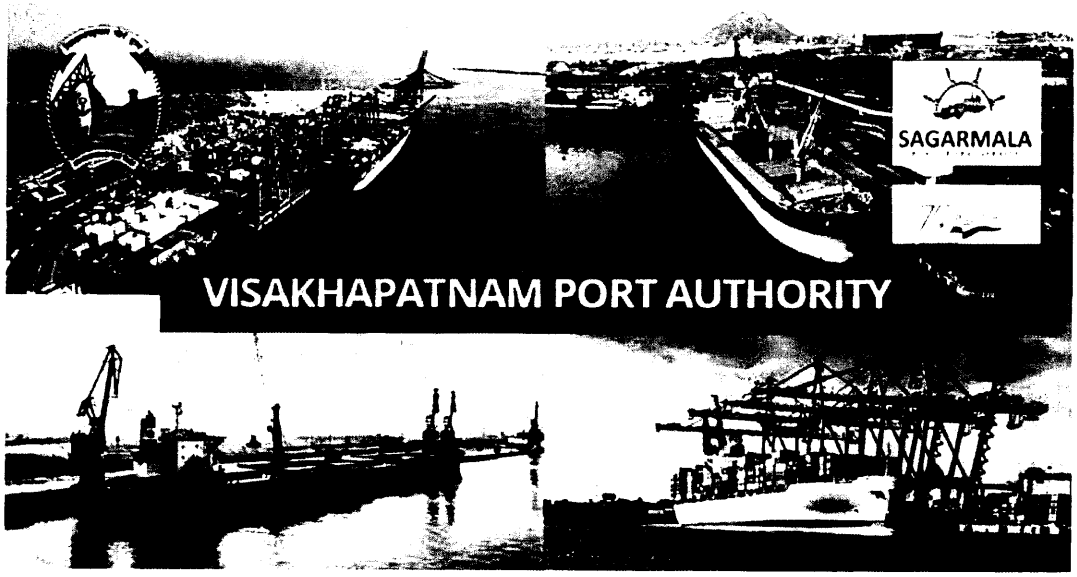
Encls: PDF copy as stated.

for TRAFFIC MANAGER
24/1/2023

P.HALDAR
Sr.Dy.Traffic Manager

C/- P.S to Chairman, for favor of information of Chairman.
C/- P.A to Dy. Chairman, for favor of information of Dy. Chairman.
C/- P.A to TM for information of Traffic Manager.
C/- CME - for information please. Copy of the APPCB letter cited is enclosed for reference. It is requested that action on directions issued under Sl. No. 5 of the said APPCB letter may please be taken at your end. Compliance in the matter (as may be communicated to this office) will be duly informed to APPCB.
C/- CE - for information please. Copy of the APPCB letter cited is enclosed for reference. It is requested that action on directions issued under Sl. No. 7 of the said APPCB letter may please be taken at your end. Compliance in the matter (as may be communicated to this office) will be duly informed to APPCB.
C/- Safety Officer/VPA -for information and necessary action.
C/- Dy. Conservator & PFSO - for information and necessary action.
C/- EMO for information and necessary action.
C/- Jt. Chief Environment Engineer, ERM Division, Head Office, APPCB, Vijayawada for information please. This has reference to APPCB letter quoted above.
C/- All importers of Ammonium Nitrate in VPA.
C/- President, Visakhapatnam Steamship Agents Association for information please.
C/- President, Visakhapatnam Stevedores Association for information please.
C/- President, Visakhapatnam Customs Brokers Association for information.
C/- Jt. Director (R&P) for information and with a request to place in VPT Website.
C/- Sr. ATM(S)/ATM(S)/ATM(FH) - for information and necessary action.
C/- Shipping Asst. (Traffic Department), he is directed to circulate the above to All Trade through e-mail

REPORT OF SAFETY AUDIT
ON
HANDLING AND TRANSPORTATION OF AMMONIUM NITRATE (FERTILIZER GRADE) WITHIN THE CUSTOM BOUND AREA OF M/S. VISAKHAPATNAM PORT AUTHORITY, VISAKHAPATNAM



Audit Team Members

Shri G. P. Nijalingappa,
Dy. Director General

Shri K. Durai
Assistant Director (Safety)

Shri Nag Mani Mishra,
Assistant Director (Safety)

OCTOBER, 2022

DIRECTORATE GENERAL FACTORY ADVICE SERVICE & LABOUR INSTITUTES
(DGFASLI)
MINISTRY OF LABOUR AND EMPLOYMENT
GOVT. OF INDIA, SION, MUMBAI – 400 022

भारत सरकार, श्रम एवं रोजगार मंत्रालय
कारखाना सलाह सेवा और श्रम संस्थान महानिदेशालय
GOVERNMENT OF INDIA, MINISTRY OF LABOUR & EMPLOYMENT
DIRECTORATE GENERAL FACTORY ADVICE SERVICE & LABOUR INSTITUTES
"श्रमसंस्थान, सरक्षा और स्वास्थ्य भवन" एस एम. मंकोकर मार्ग, शीव, मुंबई - ४०० ०२२, भारत
"Shramsansthan, Suraksha aur Swasthya Bhavan" S.M. Munkikar Marg, Sion, Mumbai - 400 022, India.

To
The Chairman
Visakhapatnam Port Authority,
Port Area, Visakhapatnam-530 035,
Andhra Pradesh

Subject: Occupational Safety and Health (Audit) Report of Visakhapatnam Port for handling and transportation of Ammonium Nitrate (Fertilizer Grade)-Reg.

Reference:ITRA/SHP/FMIN dated 30.08.2022 and email dated 21.09.2022.

Sir,

With reference to the above subject cited above it is bring to your kind notice that a team of DGFASLI officials had visited Visakhapatnam Port Authority on 06.10.2022 and 07.10.2022 for conducting safety audit of Visakhapatnam Port pertaining to safety in handling and transportation of the Ammonium Nitrate (Fertilizer Grade) within the custom bound area of VPA.

In this connection, a safety audit report (BIS 14489:2018) has been prepared and specific recommendations have been suggested by the DGFASLI officials. The final Safety Audit report is enclosed herewith for further necessary actions.

Yours faithfully,

(G.P.Nijalingappa)
Deputy Director General
DGFASLI

दूरभाष : Phone : 022-24092203 फैक्स : 022-24071986 E-mail : fasli@dgfasli.nic.in, Website : www.dgfasli.nic.in

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1. INTRODUCTION

The Chairman, Visakhapatnam Port Authority, Visakhapatnam, approached DGFASLI to carry out Safety Audit for handling and transportation of Ammonium Nitrate (Fertilizer Grade) within the custom boundary of Visakhapatnam Port Authority.

The objective of Safety Audit was to critically examine the prevailing Safety measures in the Port. In view of this, with reference to BIS 14489: 2018 and Ammonium Nitrate Rules 2012, a questionnaire was submitted to Port management. On receipt of information sought, Safety Audit Team, made a field visit to the M/s Visakhapatnam Port Authority, Visakhapatnam, followed by the discussions with the port officials on the observations and recommendations.

Prime focus has been to verify the practices & procedures followed at VPA, comparison with the national & international standard and to recommend the Safety system as applicable by the various Safety Statutes, Codes, Standards and Rules.

The Audit was aimed to highlight the strength and weakness of the system on both the Management and Technical Aspects of Safety and Health aspects and impress upon the need for improvement on the Safety Standards.

2. OBJECTIVES

The safety audit was conducted with the following objectives

- To verify the established procedure at Visakhapatnam Port for handling and transportation of Ammonium Nitrate.
- To ensure the effectiveness of the features in connection with handling and transportation of Ammonium Nitrate.
- To examine critically the procedures and practices followed in relation with various statutes and rules for handling and transportation of Ammonium Nitrate.
- To suggest measures to enhance safety with the handling and transportation of ammonium nitrate within the custom bound area of the VPA.

3. SCOPE OF AUDIT

The scope of this safety audit was limited to assess the safety and health of workers employed in the handling & transportation of Ammonium Nitrate and safety of the equipment used in the process.

The management system of audit was done to accelerate the overall development of safety management and control system. The system of audit provided scope of examining and evaluation of safety policies and procedure, internal review / inspection programme, training, supervision etc. The scope of this audit was limited to the audit elements of: -

- Safety, Health & Environment Policy
- Safety & Health Organization
- Accident Reporting, Investigation & Analysis
- Safety Inspection
- Safe Operating Procedure
- Work Permit System
- Emergency Preparedness
- Safety Education & Training
- Hazard Identification & Control
- Safety Communication/Safety Promotion/Employees Participation/ Motivation
- Electrical Safety
- Lifting Appliances & Loose Gears
- Material Handling
- Fire Protection & Prevention
- Personal Protective Equipment
- Material Safety Data Sheet (MSDS)
- First-Aid/ Hospital & Occupational Health Centre

4. AUDIT METHODOLOGY

The following methodology was adopted while carrying out the Safety Audit :-

- The Safety Audit team comprised of the following Members: -

a. Shri G. P. Nijalingappa, Dy. Director General

b. Shri K. Durai, Assistant Director (Safety)

c. Shri Nag Mani Mishra, Asst. Director (Safety).

- The Safety audit team of DGFASLI, had an opening meeting on 06.10.2022 and 07.10.2022 with following officers of M/s Visakhapatnam Port management
    1. Sri B. Ratna Sekhar Rao, Traffic Manager,
    2. Sri. V. Mohan Kumar, Asst. Traffic Manager and
    3. Sri Gnani Polumati, Port Safety Officer

- At the Meeting, the methodology and objectives of this Audit were explained. The officials were informed about the need for their co-operation in providing factually correct and authentic information to the Audit team.

- A questionnaire with regard to working conditions, work practices, handling and transportation procedures of Ammonium Nitrate, use of personal protective equipment, fire prevention and control, emergency preparedness, testing and maintenance of equipment and machinery etc. was prepared and sent to the M/s Visakhapatnam Port Authority. The completed questionnaire with the information sought was returned to the audit team by the Port Management **(enclosed at Annexure I).**

- As a part of the Safety Audit, the team made a field visit on 06.10.2022 and 07.10.2022 during which it visited the site, where handling of Ammonium Nitrate was in progress, and examined critically the working conditions, work practices, availability of fire prevention strategies, prevailing system of documentation and the material handling equipment in order to identify and evaluate the hazard potential. The deviations from the safe system of work are recorded for taking corrective measures.

- The findings from the checklists and physical inspections were evaluated by the team by means of discussions with the responsible officers in the particular areas of activity. On completion of visits, the audit team, once again made a discussion with Port officials in order to brief them with regard to the observations made by the team

and to communicate the M/s Visakhapatnam Port Management that the observations with the recommendations will be forwarded in the form of an Audit Report.

- The Safety Audit was conducted based on gaps in the management systems related to safety and health and not on any comprehensive safety inspection.

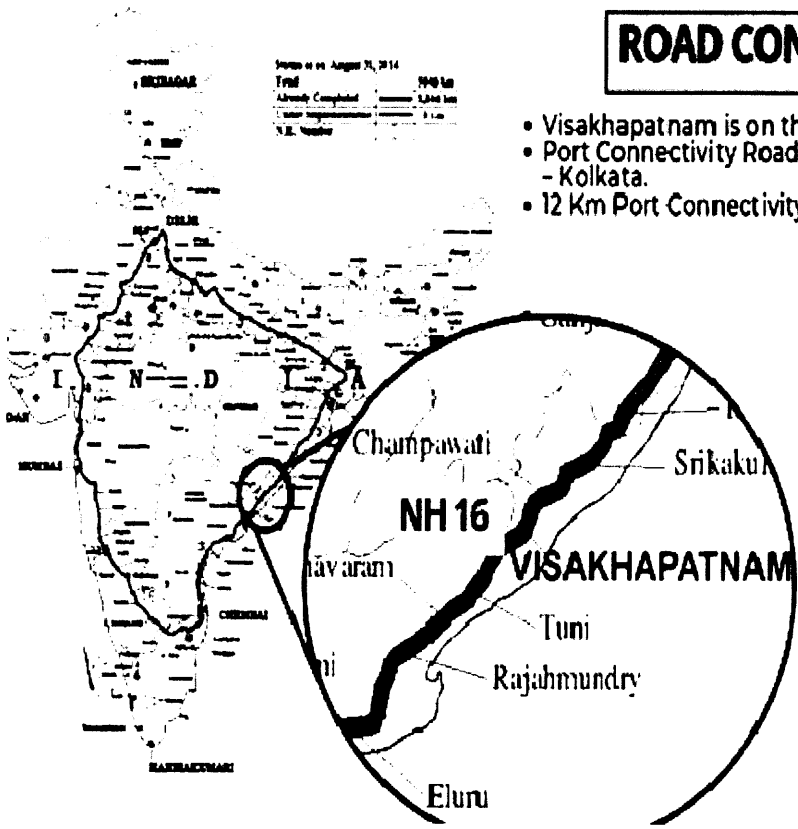
5. TERMS OF REFERENCES

The Safety Audit as per the Terms of Reference covers the following: -

- The observations made by Audit team during its field visit.
- Discussions with Port Officials.
- Standard Operating Practices and procedures developed by the Port.
- Various statutory requirement in relation to handling and transportation of Ammonium Nitrate within the custom boundary of the Port
- Management Elements of Occupational Safety and Health System relevant to the Port
- Technical Elements of Occupational Safety and Health System relevant to the Port

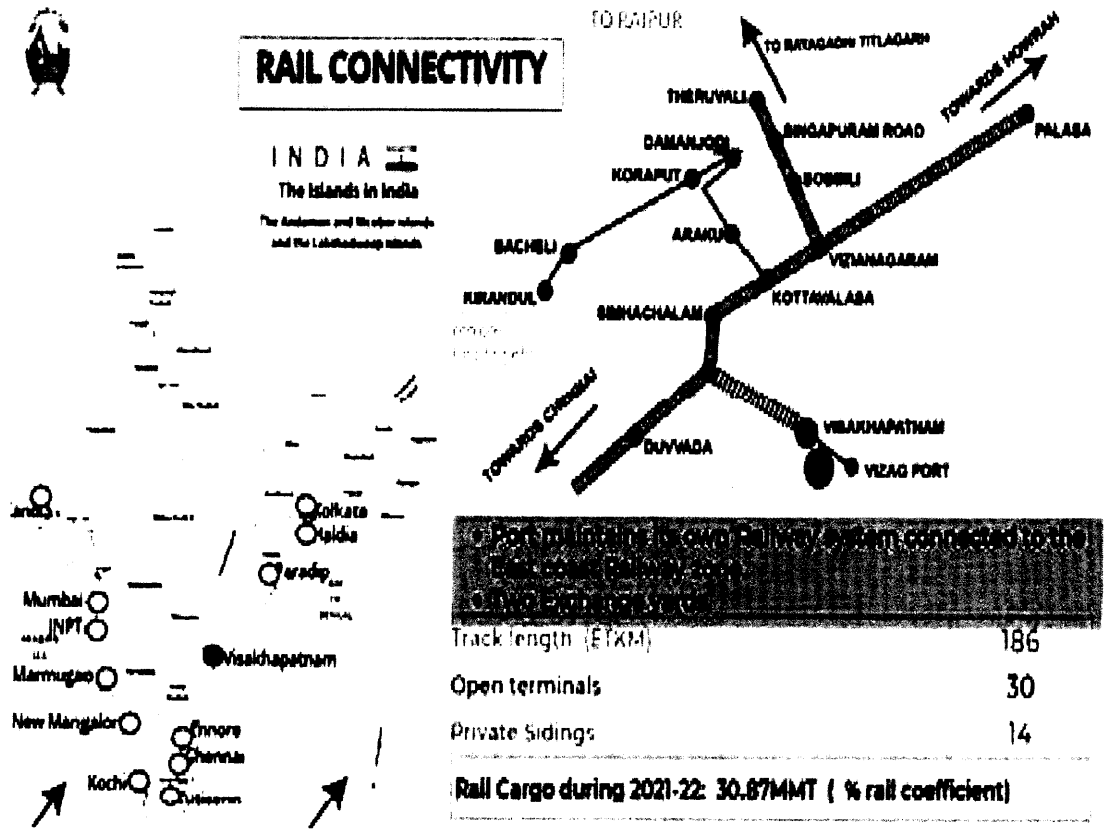
6. M/S VISAKHAPATNAM PORT AUTHORITY- AT A GLANCE

Visakhapatnam Port, one of 12 major ports in India and the only major port of Andhra Pradesh. It is India's third largest state-owned port by volume of cargo handled and largest on the Eastern Coast. It is located midway between the Chennai and Kolkata Ports on the Bay of Bengal.



Railway network at Port of Visakhapatnam is the largest amongst Indian Ports with over 200km rail length, over 30 Sidings and ~60% rail coefficient. The Port has a close interface with Waltair Division of East Coast Railways which facilitates quick transportation of EXIM cargo from/to all the States in the Country

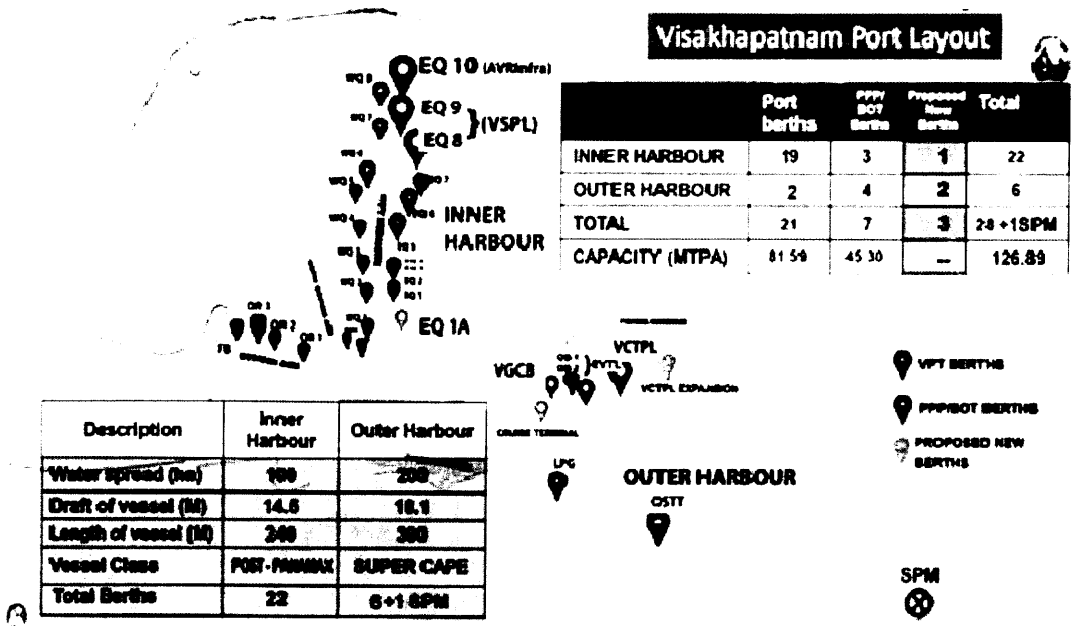
The Rail network at Port has two systems viz., Iron ore (Mechanical Tippling) and General (other than Iron ore Mechanical), for handling food grains, fertilizers, thermal coal, steel products, coking coal, Iron Ore(manual unloading) & other mineral ores, POL products etc.



Visakhapatnam Port has three harbours – the outer harbour, inner harbour and the fishing harbour. The outer harbour has 7 berths capable of handling vessels with a draft up to 17 meters while the smaller inner harbour has 22 berths that are Panamax compatible.

The Dolphin's Nose Hill to the north of the entrance channel protects the harbour from cyclones that strike the east coast.

The Visakhapatnam Port is now modernising its coal handling berth in the outer harbour to enable it to handle cape size vessels. This will also solve the problem of air pollution caused by the open handling of coal that had earlier led to citywide protests.



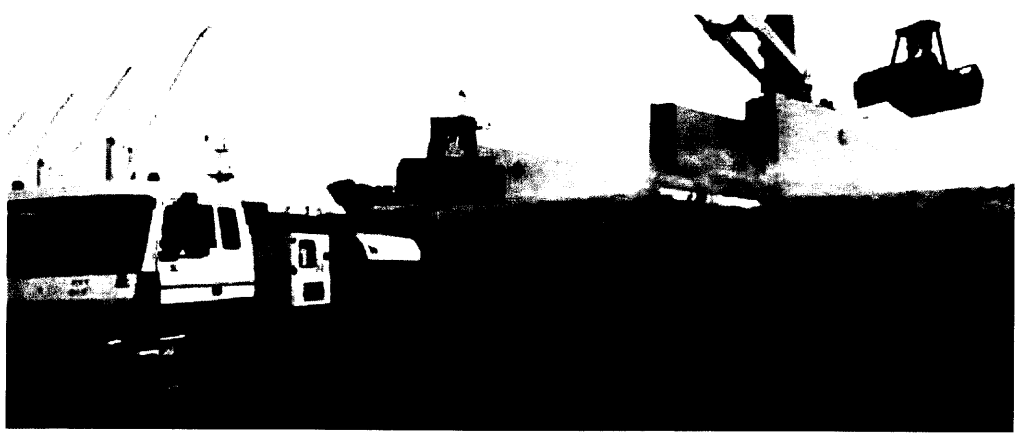
As part of its modernisation program, the port is also upgrading its general cargo, deepening its inner harbour entrance channel and strengthening five berths in the inner harbour to admit vessels with 12.5-meter draft. Other steps undertaken include the development of a truck parking terminal and a multimodal logistics hub, the procurement of two 50 tonne tugs and the installation of mechanical handling facilities in the inner harbour for dry bulk cargo. There are also plans to relocate the fishing harbour at the port to allow for the expansion of berths and stacking areas and dredging of the Outer Harbour is also being undertaken to increase the draft of the main channel to 21 meters. Since the year 2021, Visakhapatnam Port is under Major Ports Authority.

Port of Visakhapatnam is accredited with ISO Certification (ISO 14001) by the Indian Register of Quality Systems for the Environmental Management System standards in all its activities including related support services.

Sub-Committees are constituted to review and monitor AAQ (Ambient Air Quality), Green Belt Development and Hazard Management. The EMC reviews the findings of the Sub-Committees and advises suitably on the environmental improvement measures.

The measures taken by the Port to mitigate Environmental Pollution include:

- Monitoring of Ambient Air Quality at six locations in and around the Port area
- Regular monitoring of pollution control measures in and around Port area and residential areas.
- Preparation of Environmental Management Action Plan
- Environmental cell has been established to monitor the environmental activities of the Port, duly appointing persons qualified in the field of Environment Management.



(i) Practices and procedures in-place for handling and transportation of Ammonium Nitrate at VPA

a. Practices

In exercise of the power conferred under Rule 6(4) of Ammonium Nitrate Rules 2012, the Central Government in consideration of necessity to import Ammonium Nitrate in public interest, Major Port of Visakhapatnam has been notified for import of Ammonium Nitrate **(Gazette notification enclosed at Annexure II).**

Ammonium nitrate is handled in Visakhapatnam Port on the strength of the licenses issued by The Petroleum and Explosives Safety Organization [PESO] to the concerned stakeholders, importers etc., and importing in jumbo bags and handled under the established set of safety measures. As per traditional practice, the cargo is unloaded from vessel on to the wharf, again loaded onto the trucks and containers using lifting appliances and thereafter transported to the designated destination either through trucks or railway wagons.

Importers and Stevedores prior to commencement of discharging of Ammonium Nitrate, port authority is obtaining an undertaking as precautionary measures **(enclosed at Annexure III)** to be complied by them, for ensuring smooth and safe handling of the Ammonium Nitrate cargo in jumbo bags.

In addition to the above, the concerned Cargo Handling Agency (CHA) in case of vessels carrying import Ammonium Nitrate furnishes the following mandatory documents as listed

1. Indemnity confirmation.
2. Customs Documents
3. Letter to Fire Officer, VPA for deployment of Fire Tender.
4. Intimation letter to VPA, District Collector, Commissioner of Police, Intelligence of Bureau, Inspector of Dock Safety and CISF.
5. P-5 and P-4 License issued by PESO.
6. Sanction quantity for delivery by PESO.
7. NOC issued by the Police Dept.
8. Intimation to APPCB.
9. Quality & Quantity inspected certificate.
10. Public Liability Insurance.

11. Marine Cargo Insurance.

b. Procedures

1. Import Ammonium Nitrate cargo discharged from the vessel in form of 01 Tonne/ 900 Kgs / 500 Kgs in Jumbo Bags and the same is stuffed into containers owned and supplied by M/s CONCOR and also into trucks permitted by Police.

2. Trucks delivery of the said consignment is moved up to importer's destination only after proper verification of the credentials of the Truck driver, helper by District Police Administration.

3. The trucks laden with import Ammonium Nitrate Jumbo bags are fully covered and secured with Tarpaulin covers besides proper lashing.

4. VPA ensures that the wharf area ear marked for discharge of import Ammonium Nitrate Jumbo bags is spread with tarpaulin cover to avoid direct contamination of the wharf area.

5. VPA ensures that at any point of time during the course of discharge of import Ammonium Nitrate Jumbo Bags on the wharf, only 10 No. of bags are permitted to be stacked on the wharf

6. VPA ensures that sufficient No. of shore labour are engaged for good housekeeping in the handling area.

7. VPA ensures that the discharge of import Ammonium Nitrate in Jumbo Bags is carried out in an quantity for which the permission/licence granted by PESO

8. In order to avoid the risk of any eventuality, storage of imported Ammonium Nitrate cargo in Transit sheds, ware houses, go-downs and within the premises of the city of Visakhapatnam is not allowed/permitted and strictly prohibited

9. In order to facilitate the same, direct delivery of the discharged import Ammonium Nitrate cargo from the berth to their destination is encouraged.

(ii) AMMONIUM NITRATE HANDLED (during last 5 years)

Year	Tonnage	Vessels Count	Annual
2022-23	84,524	7	38,545,793
2021-22	224,443	23	69,030,004
2020-21	230,581	18	69,842,677
2019-20	250,351	18	72,724,709
2018-19	257,474	21	65,300,614
2017-18	163,121	15	63,625,998

(iii) FIRE AND ACCIDENT STATISTICS IN HANDLING AMMONIUM NITRATE (AT VPA)

Number of Fire incidents and accident in handling Ammonium Nitrate at Visakhapatnam Port Authority - **NIL**

7. HEALTH AND SAFETY ASPECTS OF AMMONIUM NITRATE

Vide Notification No. G.S.R. S.O. 1678(E) dated 21/07/2011, Ammonium Nitrate having the chemical formula NH_4NO_3 or any combination containing more than 45 percent of ammonium nitrate by weight including emulsions, suspensions, melts or gels (with or without inorganic nitrates) shall be deemed to be an explosive under the meaning of the Explosives Act 1884. Provided that such ammonium nitrate or any combination thereof shall not include those fertilizers from which ammonium nitrate cannot be extracted by any physical or chemical means.

Ammonium Nitrate is not an explosive by itself. However, it is one of the ingredients used for manufacture of explosives. Small amount of contaminants are sufficient to act as a catalyst explaining the unpredictability of Ammonium Nitrate under fire conditions. It is classified as an Oxidizer (5.1) as per UN classification for Dangerous Goods. It is one of the base ingredients used in the manufacture of commercial explosives. Due to this reason, Ammonium Nitrate has been declared as explosives and defined in Rule 2(b) of the Ammonium Nitrate Rules, 2012.

Manufacture conversion, stevedoring and bagging, import, export, transport, possession for sale or use of Ammonium Nitrate is covered under Ammonium Nitrate Rules, 2012 framed under the Explosives Act, 1884. A license under the Ammonium Nitrate Rules, 2012 is also required for any of the activities mentioned above.

Ammonium nitrate, a chemical compound with the chemical formula NH_4NO_3 is a white crystalline salt consisting of ions of ammonium and nitrate. It has Melting Point of 442.8K (169.6°C) and decomposes (boiling Point) at 483K (210°C). It is highly soluble in water and hygroscopic as a solid, although it does not form hydrates. It is predominantly used in agriculture as a high-nitrogen fertilizer.

Its other major use is as a component of explosive mixtures used in mining, quarrying etc.

Reactions

Solid ammonium nitrate decomposes on heating. At temperatures below around 300 °C, the decomposition mainly produces nitrous oxide and water:

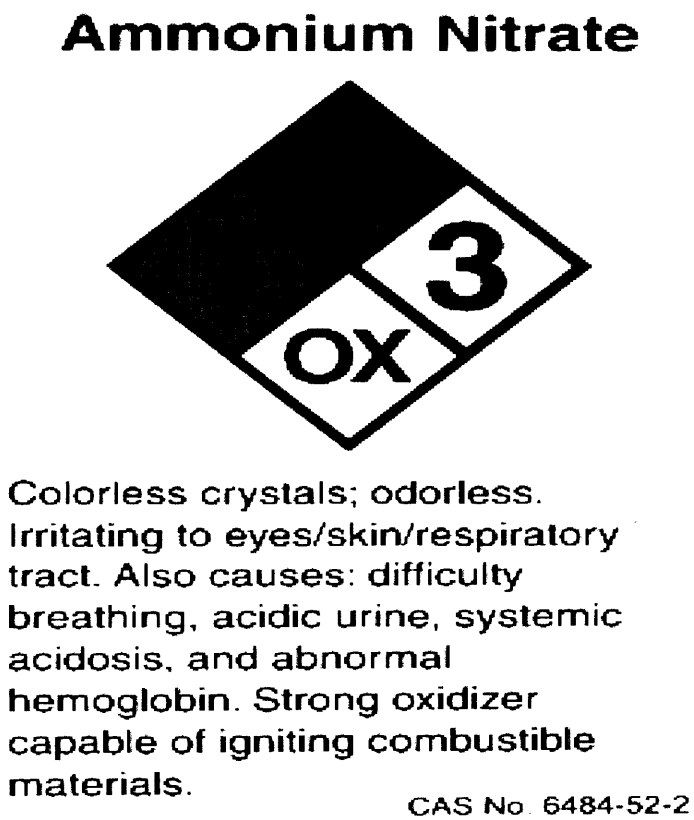
$$NH_4NO_3 \rightarrow N_2O + 2H_2O$$

At higher temperatures,

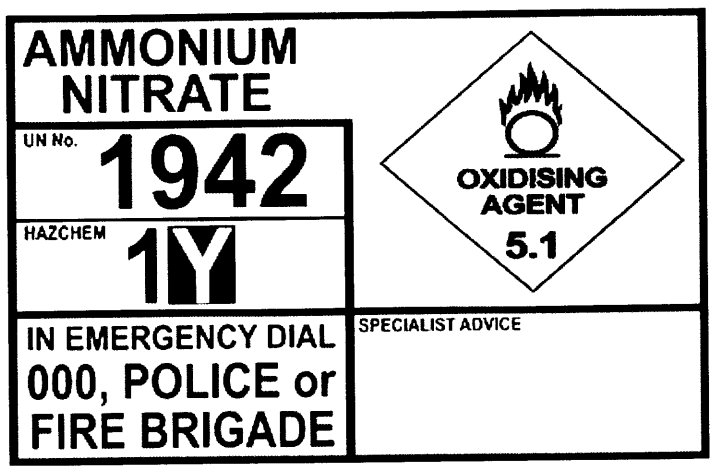
$$2NH_4NO_3 \rightarrow 2N_2 + O_2 + 4H_2O$$

Both decomposition reactions are exothermic and their products are gas. Under certain conditions, this can lead to a runaway reaction, with the decomposition process becoming explosive.

NFPA Label for Ammonium Nitrate



Emergency Information Panel (EIP) for Ammonium Nitrate



Safety, handling, and storage of AN

Numerous safety guidelines are available for storing and handling ammonium nitrate. Health and safety data are shown on the safety data sheets available from suppliers and from various governments.

Pure ammonium nitrate does not burn, but as a strong oxidizer, it supports and accelerates the combustion of organic (and some inorganic) material. It should not be stored near combustible substances.

While ammonium nitrate is stable at ambient temperature and pressure under many conditions, it may detonate from a strong initiation charge. It should not be stored near high explosives or blasting agents.

Contact with certain substances such as chlorates, mineral acids and metal sulfides, can lead to vigorous or even violent decomposition capable of igniting nearby combustible material or detonating.

Ammonium nitrate begins decomposition after melting, releasing NOx, HNO_3, NH_3 and H_2O. It should not be heated in a confined space. The resulting heat and pressure from decomposition increases the sensitivity to detonation and increases the speed of decomposition. Detonation may occur at 80 atmospheres. Contamination can reduce this to 20 atmospheres.

Ammonium nitrate has a critical relative humidity of 59.4% at 30°C. At higher humidity it will absorb moisture from the atmosphere. Therefore, it is important to store ammonium nitrate in a tightly sealed container. Otherwise, it can coalesce into a large, solid mass. Ammonium nitrate can absorb enough moisture to liquefy. Blending ammonium nitrate with certain other fertilizers can lower the critical relative humidity.

8. NATIONAL REQULATORY FRAMEWORKS FOR HANDLING AMMONIUM NITRATE IN PORTS

The Central Government has framed the following rules and regulations applicable to the handling of ammonium nitrate in ports. Inspectors and regulatory agents are appointed under the said rules and regulations for enforcing safety, health and environment in the port.

A. The Environment (Protection) Act, 1986

The Environment (Protection) Act was enacted in 1986 with the objective of providing for the protection and improvement of the environment. It empowers the Central Government to establish authorities [under section 3(3)] charged with the mandate of preventing environmental pollution in all its forms and to tackle specific environmental problems that are peculiar to different parts of the country.

B. Manufacture, Storage and Import of Hazardous Chemical (MSIHC) Rules, 1989.

Govt. of India has promulgated "Manufacture, Storage, and Import of Hazardous Chemicals (MSIHC) Rules, 1989" under the Environment (Protection) Act, 1986. According to Section 18 (2) of the said rule, any person responsible for importing hazardous chemicals in India shall provide (before thirty days or as reasonably possible but not later than) the date of import, to the concerned authorities as identified in Column 2 of Schedule 5, the information pertaining to,

- Name and Address of the person receiving the consignment in India;
- The port of entry in India;
- Mode of transport from the exporting country to India;
- The quantity of chemical(s) being imported; and
- Complete product safety information.

The above rule is applicable to a chemical which satisfies any of criteria laid down in part I of Schedule I or listed in Part II of this Schedule. The Central Pollution Control Board (CPCB) or the State Pollution Control Boards / Pollution Control Committees

have been identified as the Authority for enforcement of directions and procedures in respect of isolated storage of hazardous chemicals and Import of hazardous Chemicals and enforcement of directions and procedures on import of hazardous chemicals as per Rule 18 of MSIHC Rules, 1989.Competent authorities and their duties are given in Schedule V of the MSIHC Rules, 1989.

The following important provisions under the MSIHC Rules, 1989 shall be complied as applicable by the manufacture, supplier, occupier and the importer for handling ammonium nitrate in Ports in our country.

Rule 5 – Notification of Major Accidents
Rule 7 - Approval and Notification Of Sites
Rule 10 – Safety Report and Safety Audit Report
Rule 13 - Preparation of On-Site Emergency Plan by the Occupier
Rule 14 – Preparation of Off-Site Emergency Plan by the authority
Rule 17 – Safety Data Sheet (Schedule 9)
Rule 18 – Import of Hazardous Chemicals

C. Ammonium Nitrate Rules, 2012

Ammonium Nitrate Rules, 2012 was framed under the Explosives Act, 1884 by the Ministry of Commerce and Industry and the Ammonium Nitrate was declared as an Explosive in the year 2011 by the Petroleum and Explosives Safety Organisation. The Chief Controller is the competent authority under the Explosives Act, 1984.

The following important provisions under the Ammonium Nitrate Rules, 2012 shall be complied as applicable by the port authority, stevedores, ship agents and the importers etc., for handling ammonium nitrate in Ports in our country.

1. **Safety and Security Management Plan:** A person intending to manufacture, convert or stevedore Ammonium Nitrate shall submit Safety and Security Management Plan to the licensing authority and to the District Authority with the security aspect duly endorsed by the Superintendent of Police or Deputy Superintendent of Police, as the case may be.

(Rule 15 of the Ammonium Nitrate Rule, 2012.)

The plan shall include the following safety and security aspects.

(a) Assigned responsibility and organisational structure
(b) Hazard identification, risk assessment and control
(c) Provision of information, education and training to the work force, contractors and visitors
(d) Accident reporting and investigation
(e) Emergency response planning and preparedness such as first aid, testing of emergency plan once in a year
(f) Disaster Management Plan and provision of escape routes, identifying and assessing security risk associated with the activities; evacuation plan, appropriate fire fighting controls
(g) Set of process adopted by the holder of the licence to carry out authorised activities and keeping of Ammonium Nitrate secure;
(h) Maintenance of schedules for plant and equipment
(i) Standard operating procedure
(j) Competence of personnel for tasks
(k) Nature of the surveillance
(l) Documentation and record keeping so as to ensure accountability, identification and traceability of Ammonium Nitrate; security arrangement for storehouse, tankers containing Ammonium Nitrate melt, transport of Ammonium Nitrate by vehicles, security during transport of Ammonium Nitrate including its loading or unloading; mechanism for controlling and restricting access of unauthorised person to Ammonium Nitrate storage; assigning of responsibility for ensuring compliance with plan or task

2. Recovery of Spillage during handling: If any spillage occurs during the process of handling of Ammonium Nitrage at any stage, it should be carefully collected and bagged and accounted for and the spillage, if not contaminated, may be transferred expeditiously only to a licensee after proper accounting. **(Rule 10 of the Ammonium Nitrate Rules, 2012)**

3. Marking of Ammonium Nitrate bags: (i) Each bag containing Ammonium Nitrate shall be marked in conspicuous indelible characters, by means of stamping or painting with –

(a) the words **"AMMONIUM NITRATE"**
(b) purity in percentage
(c) the name, address and license number of manufacturer or converter or importer
(d) identification number of the bag or bar coding
(e) the net weight of Ammonium Nitrate
(f) gross weight of the bag

(g) date of bagging and batch number

(h) name, address, licence number and unique identification number of stevedoring agent, if any

(ii) The bags shall be serially numbered with date of bagging by means of stencilling, bar coding, by RFID tags or any other means by the manufacturer or importer as directed by the Chief Controller. **(Rule 9 of the Ammonium Nitrate Rules, 2012)**

4. Restriction on toxic, corrosive, dangerous or flammable substances: No toxic, corrosive or flammable or otherwise dangerous substances such as carbonaceous matter, reducing agents, petroleum, carbide of calcium, compressed gases or any other chemical which may react with Ammonium Nitrate in a manner that may result in an explosion shall be allowed in the premises meant for import, transport or handling of Ammonium Nitrate. **(Rule 9 of the Ammonium Nitrate Rules, 2012).**

5. Packing of Ammonium Nitrate: No person shall import, export, transport, possess or sell Ammonium Nitrate unless; **(Rule 8 of the Ammonium Nitrate Rules, 2012)**

(a) it is duly packed in a suitable waterproof bag

(b) the bag is marked in accordance with the provisions of rule 9

(c) the bags conform to the relevant standard of Bureau of Indian Standards or other standards accepted and approved by the Chief Controller and

(d) the bags of Ammonium Nitrate for export or import conform to the requirements of the tests as specified under International Maritime Dangerous Goods Code(IDMG Code) or United Nations recommendations on the transport of Dangerous Goods.

6. Restriction on employment of children, intoxicated persons and certain other persons: No person shall employ, allow or engage a person

(a) who is below the age of eighteen years; or

(b) who is in a state of intoxication; or

(c) who is mentally or physically challenged,

for loading, unloading or transport of Ammonium Nitrate or to enter any premises permitted for handling.

7. Restriction on import or export: (Rule 6(4) of the Ammonium Nitrate Rules, 2012)

(a) No person shall import or export any Ammonium Nitrate except under and in accordance with the conditions of licence granted under the Ammonium Nitrate Rules, 2012

(b) No Ammonium Nitrate shall be imported or exported except at its ports notified by the Central Government

(c) The Ammonium Nitrate shall not be imported into India by Sea except through the ports which are duly approved for this purpose by the Ministry of Shipping and Transport, Government of India, in consultation with the Chief Controller of Explosives and declared as Customs Port by the Commissioner of Customs.

(d) The Ammonium Nitrate imported into India by sea **shall not be stored in the port**

(e) The Ammonium Nitrate shall be imported by the importer only for his own bonafide use and not for sale.

(f) The Ammonium Nitrate shall be exported by its manufacturers only.

8. Restriction on stevedoring, bagging and possession for sale or use: (Rule 6(3) of the Ammonium Nitrate Rules, 2012)

(a) No person shall undertake stevedoring, bagging and possession for sale or use Ammonium Nitrate except under conditions of a licence granted under the Ammonium Nitrate Rules, 2012 at a licensed store house as specified therein;

(b) No person shall store, process, deliver, receive, handle or transport any Ammonium Nitrate contaminated fully or partially with any organic material, metal powder or scraps, or sulphur, phosphorous etc.

9. Restriction on transport: (Rule 6(5) of the Ammonium Nitrate Rules, 2012)

(a) The Ammonium Nitrate shall not be transported with any other explosives, inflammable substances, oil, gases, carbonaceous matter, etc.

(b) No Ammonium Nitrate shall be transported in any carriage vessel plying for or carrying passengers on hire.

10. Restriction on handling Ammonium Nitrate: No person shall handle or cause to be handled any Ammonium Nitrate between the hours of sunset and sunrise: **(Rule 6(7) of the Ammonium Nitrate Rules, 2012)**

Provided that nothing in this rule shall apply to handling of Ammonium Nitrate during the dark hours if proper illumination is provided in the area and the place is guarded.

Petroleum and Explosive Safety Organisation

The Petroleum and Explosives Safety Organization (PESO), formerly known as Department of Explosives, since its inception on 05/09/1898, has been serving the nation as a nodal agency for regulating safety of hazardous substances such as explosives, compressed gases and petroleum. PESO's major work is to administer the responsibilities delegated under the Explosives Act 1884 and Petroleum Act 1934 and the Rules made there under with the motto "Safety First".

PESO has its Headquarters at Nagpur in Maharashtra and serves through nine Circle Offices viz Agra, Bhopal, Chennai, Faridabad, Guwahati, Hyderabad, Kolkata, Mumbai, Vadodara and their subordinate Sub-Circle offices across the country

The Ammonium Nitrate Rules, 2012 framed under the Explosives Act 1884 is under purview of the Petroleum and Explosives Safety Organization and the PESO is headed by the Chief Controller of Explosives appointed under the Explosives Act, 1884.

D. The Dock Workers (Safety, Health and Welfare) Act, 1986 and Regulations, 1990.

The Central Government has enacted the Dock Workers (Safety, Health and Welfare) Act, 1986 and framed Regulations, 1990 thereunder for safety, health and welfare of the dock workers employed in major ports of the country.

Regulation 7 of the said Regulations provide for the responsibility of the various stakeholders such as master of the vessel, Chief officer of the vessel, port authority, ship agents, owner of the lifting appliances and loose gears, employers of the dock workers, competent person etc., in the port for handling cargo

Regulations 76 to 82 of the said Regulations deal with handling dangerous goods in the port which are given as follows:

Reg 76 – Notification

Reg 77 – General Precautions

Reg 78 – Explosives and inflammable cargo

Reg 79 – Other Dangerous Goods

Reg 80 – Handling of Tetraethyl Lead Compound

Reg 81 – Broken or leaking containers

Reg 76 – Toxic Solvents

List of dangerous goods is given in Schedule II of the Regulations which is given as under:

SCHEDULE II

CLASSIFICATION OF DANGEROUS GOODS

(See Regulation 76)

Class 1. Explosives.

Class 2. Gases: compressed, liquified and dissolved under pressure.

Class 3. Inflammable liquids.

Class 4.1 Inflammable solids.

Class 4.2 Inflammable solids, or substances, liable to spontaneous combustion.

Class 4.3 Inflammable solids, or substances, which in contact with water emit flammable gases.

Class 5.1 Oxidizing substances.

Class 5.2 Organic peroxides.

Class 6.1 Poisonous (toxic) substances.

Class 6.2 Infectious substances.

Class 7 Radioactive substances.

Class 8 Corrosives.

Class 9 Miscellaneous dangerous substances.

Dangerous substances belonging to class 9 above include any such substance which cannot be referred to any other class but which experience has shown to be so dangerous

that these regulations shall apply to it.

9. INTERNATIONAL PRACTICES ON HANDLING OF AMMONIUM NITRATE

Previous disasters necessitate public awareness of the explosive nature of ammonium nitrate, and the consequences of its handling and transportation. In response, many regulations, rules and guidelines for ammonium nitrate, especially regarding its storage and handling, have emerged in different areas to improve safety. The primary U.S. regulations for ammonium nitrate are "OSHA 29 CFR 1910.109 (i) – Storage of Ammonium Nitrate", and the Memorandum of "Guidance on the Ammonium Nitrate Storage Requirements in 29 CFR 1910.109(i)" published in 2014 after the Adair Grain Inc., DBA West Fertilizer Company explosion in 2013. Noteworthy, however, the diligent enforcement of the safety rules and regulations is the key for avoiding future accidents.

(a) United Nations

The United Nations and its specialised agencies provide international regulation standards for the transport of dangerous goods by all modes. The UN Recommendations on the Transport of Dangerous Goods (known as the Orange Book) provides an internationally accepted standard of technical criteria for classification of dangerous goods and minimum specifications for the transport of dangerous goods by all modes. The recommendations themselves are not obligatory, but form the basis of several international agreements and may be implemented by regulatory bodies in national law.

(b) International Maritime Organisation

The International Maritime Organisation (IMO) is a specialised agency of the UN which promotes cooperation among governments and the shipping industry to improve maritime safety and prevent marine pollution. The IMO provides guidance and regulation for the sea transport of dangerous goods including 11 publishing the International Maritime Dangerous Goods Code (IMDG Code), producing new conventions and amending existing maritime conventions as necessary to keep them up to date.

Two of the most significant of the international maritime conventions in force today are SOLAS 74 and MARPOL 73/78. Under these conventions the IMDG Code has been mandatory since 1 January 2004. Observance of the Code ensures compliance with the mandatory provisions of the SOLAS Convention and of Annex III of MARPOL.

(c) International Maritime Dangerous Goods (IMDG) Code

The International Maritime Dangerous Goods (IMDG) Code is a detailed publication produced and updated every two years by the IMO Subcommittee on dangerous goods, solid cargoes and containers. The IMDG Code is supported by a variety of international conventions, codes and recommendations such as:

- A Code of Safe Practice for Solid Bulk Cargoes
- The International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk
- The International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk
- Recommendation on the Safe Transport of Dangerous Cargoes and Related Activities in Port Areas
- International Recommendations concerning the Carriage of Dangerous Goods by Rail (RID), Road (ADR) and by inland waterways (AND and ADNR)

Various specialized organizations, commissions and committees are responsible for the Code while the basic principles published in the IMDG code come from the 'Recommendation on the Transport of Dangerous Goods, Model Regulation', more commonly known as the Orange Book (United Nations Committee of Experts on the Transport of Dangerous Goods). The Orange Book harmonizes a system of classification and labelling recommendations for the transport of dangerous goods.

Classification of Dangerous Goods

The classification is made by the consignor/shipper or by the appropriate competent authority. The IMDG Code classifies dangerous goods as follows (simplified form):

- Class 1: Explosives

- Class 2: Gases
- Class 3: Flammable Liquids
- Class 4: Flammable solids; substances liable to spontaneous combustion; substances which, in contact with water, emit flammable gases
- Class 5: Oxidizing substances and organic peroxides
- Class 6: Toxic and infectious substances
- Class 7: Radioactive material
- Class 8: Corrosive substances
- Class 9: Miscellaneous dangerous substances and articles

The numerical order of the classes and divisions does not indicate the degree of danger.

The IMDG Code is supported by a variety of international codes and publications such as the Recommendation on the Safe Transport of Dangerous Cargoes and Related Activities in Port Areas. These recommendations in particular are intended to align with relevant IMO codes and the IMDG Code in particular, to harmonise the rules within the port area with the ship operations. The recommendations are non-obligatory guidelines that may be implemented by national or state legislation.

(d) US Chemical Advisory: Safe Storage, handling and management of solid ammonium nitrate prills.

The Environmental Protection Agency (EPA), the Occupational Safety and Health Administration (OSHA), and the Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF) issued an advisory as part of an effort to improve chemical risk management, advance ammonium nitrate safety, and protect human health and the environment. This advisory contains information on incidents involving ammonium nitrate (NH4NO3 - commonly referred to as "AN"), AN hazard, hazard management, and steps for emergency planning, and safe emergency response.

The U.S. Department of Transportation (DOT) classifies solid AN prills (i.e., small beads) containing no more than 0.2 percent combustible substances as a Division 5.1 oxidizer. There are two commercial forms of prills: (1) "technical grade" (TGAN) used in the manufacture of blasting agents, and (2) "fertilizer grade" (FGAN) used as a

fertilizer or in fertilizer blends. The only difference between TGAN and FGAN is the density of the prills. TGAN has lower density to better retain additives used to produce blasting agents. The two forms are chemically identical and present the same hazards when involved in fires.

This advisory is meant to apply to both grades of AN prills and to all facilities and persons managing or using the material for any purpose. The advisory also provides a list of information resources, including relevant codes and standards, industry publications, and applicable statutes and regulations to help facilities safely handle AN, and emergency responders better understand AN hazards so they can effectively manage the associated risks.

Hazard Classification

DOT classifies AN (both FGAN and TGAN) as a Division 5.1 oxidizer if it contains not more than 0.2 percent combustible substances, or, if it is an AN fertilizer blend, if it contains not more than 0.4 percent combustible substances.

The National Fire Protection Association (NFPA) assigns solid oxidizers to Class 1, Class 2, Class 3, or Class 4 where Class 4 is the most oxidizing. AN is a Class 2 oxidizer. NFPA also assigns AN an instability rating of 3 (in a range of 0-4 with 4 being the most unstable) to alert emergency responders that AN is capable of detonation, explosive decomposition, or explosive reaction when exposed to a strong initiating source or when confined at high temperature. Explosions occur more readily when fuels or sensitizing contaminants are present.

(e) National Fire Protection Association

NFPA codes and standards are developed through a consensus standards development process approved by the American National Standards Institute. This process brings together volunteers representing various viewpoints and interests to achieve consensus on safety issues. These codes and standards are not binding but may be adopted by

reference into laws or regulations. Users of the codes and standards should consult applicable federal, state and local laws and regulations for conflicts or additional requirements.

NFPA 400 Code Chapter 11 addresses the storage, use, and handling of solid AN, including fertilizer grade, industrial grade and mixtures containing 60 percent or more AN by weight. It also covers liquid AN solution 70% or more AN by weight. It does not cover AN or AN mixture that are DOT Hazard Class 1 (explosives and blasting agents) which are covered in NFPA 495 and includes explosives and blasting agents containing AN.

NFPA 400 — Hazardous Materials Code, Chapter 11 - Ammonium Nitrate Solids and Liquids (2016). The 2016 edition likely includes enhanced safety standards:

- Non-combustible construction for new storage buildings
- Fire detection and suppression system for existing buildings constructed of combustible materials and new storage buildings
- An emergency action plan should establish a safe evacuation distance based on approved analysis
- Emergency action plans for facilities storing AN must be prepared in accordance with accepted standards and approved by the Authority Having Jurisdiction

(f) UK Standard/guidelines on storing and handling ammonium nitrate

Health and Safety Executive (HSE)'s leaflet INDG230 Storing and handling ammonium nitrate provides information relating to the general duties imposed on employers by the Health and Safety at Work etc Act 1974 with regard to the safe storage and handling of ammonium nitrate at, for example, harbours, merchant stores and manufacturers' premises.

HSE has produced a self-help checklist to help those storing ammonium nitrate determine if there are further measures, they could take to ensure safe handling and storage of ammonium nitrate. This checklist is issued to all safety and security inspectors.

The following legislation is relevant to importing and storing ammonium nitrate in UK:

- Control of Major Accident Hazards Regulations (COMAH)
- Dangerous Substances (Notification and Marking of Sites) Regulations 1990
- Ammonium Nitrate Materials (High Nitrogen Content) Regulations
- Planning (Hazardous Substances) Regulations

(g) Australian Standard 3846: The handling and transport of dangerous cargoes in port areas

The handling and transport of dangerous cargoes in port areas is applied at most Australian ports. This standard was developed to complement the IMO Recommendations on the Safe Transport of Dangerous Cargoes and Related Activities in Port Areas. AS3846 sets out the principal requirements for handling dangerous cargoes in ports including:

- notifying port authorities of dangerous cargo shipments
- general requirements and procedures for the safe handling of dangerous cargoes
- segregating incompatible products
- time constraints for products kept on the wharf (the higher the hazard the shorter the time the product may be held on the wharf)
- emergency response procedures, including firefighting resources
- management systems to cover aspects such as training and communication.

The competent authority for sea transport, the Australian Maritime Safety Authority (AMSA), is responsible for implementing the IMO regulations in Australia for all safety-related aspects of the sea transport, and developing standards, procedures and Marine Orders relating to shipping and maritime safety including the carriage of dangerous cargo including bulk liquid and solid cargoes, general cargoes, and containers as well as emergency response plans. Under the Australian Maritime Safety Authority Act 1990, AMSA's role includes protection of the marine environment from pollution from ships and other environmental damage caused by shipping.

The National Marine Oil Spill Contingency Plan (NATPLAN) and the National Marine Chemical Spill Contingency Plan (CHEMPLAN) outline the process for dealing with spills and accidents and provide a framework for state response plans and include a process for activating National Plans in the case of a major accident involving ship-sourced chemical, oil and other noxious and hazardous substances.

The road and rail transport of dangerous goods in Australia is given national uniformity by the Australian National Transport Commission (NTC) which produces the ADG Code as well as model legislation for the road and rail transport of dangerous goods intended for each State and Territory to adopt and enforce. The ADG Code is mandatory for land transport of dangerous goods including transport to and from the port area, until the product reaches its destination.

Western Austria has also framed the Dangerous Goods (Transport) (Dangerous Goods in Ports) Regulations 2001 under the Dangerous Goods (Transport) Act 1998 for safe handling and transporting of dangerous goods including ammonium nitrate in ports.

(h) Fremantle Ports Dangerous Cargoes Standard (April 2020)

(i) Fremantle Ports in Australia

Fremantle Port Authority, also known by its registered business name Fremantle Ports, is the responsible authority created under the Western Australian Port Authorities Act 1999.

Fremantle Ports Safety Management System includes:

- emergency response training, including oil response drills
- a Security Centre staffed 24 hours a day with trained personnel
- auditing and monitoring of activities relating to dangerous cargo operations
- quantitative risk assessments for dangerous cargo port operations and specific cargo operations, as well as regular reviews of the Inner Harbour operations to ensure the Environmental Protection Authority's public risk criteria are not exceeded as a result of dangerous cargoes throughput

- Fremantle Ports Incident Management Plan - is a comprehensive emergency response and evacuation plan for port areas linking berth operators' emergency response plans to the Fremantle Ports Incident Management Plan

- Fremantle Ports Dangerous Cargoes Standard - was first developed in 1999 and revised several times to keep abreast of requirements. (Based on AS 3846, this document provides advice to the shipping industry regarding the application of AS 3846 to Fremantle Port including any quantity limits or time restrictions for dangerous cargoes in the port area and the responsibilities for the handling of dangerous cargoes through the port.)

(ii) Requirements for the entry of dangerous cargoes into Fremantle ports

1. Advance notification of dangerous cargoes At least 48 hours advance notification should be given for any dangerous cargo intended to be brought into port waters or onto a berth. This is required for all dangerous cargoes intended to be loaded or unloaded as well as transit cargoes.

2. Request for permission for high hazard dangerous cargoes Permission from Fremantle Ports must be obtained for all high hazard dangerous cargoes before they are moved through the port. If your cargo is not high hazard dangerous cargoes a permission is not required.

Permission should be sought well before the advance notification of such shipments and in some instances during the planning stage. Cargoes are considered to be high hazard due to one or more of the following:

- special hazards associated with the cargoes

- the need to ascertain the conditions under which cargo entry may be permitted

- the need to liaise with or to seek approval from other regulatory authorities

- the need to undertake specific risk assessment or to ensure appropriate Safety Management Systems are in place before handling of the cargo

- the need to coordinate port services, emergency resources and other shipping movements.

(iii) Berth limits for dangerous cargoes

- **Berth quantity limits for dangerous cargoes**

  The operator of the berth is responsible for ensuring that any quantity restrictions which apply to dangerous cargoes are not exceeded.

- **Time limits for dangerous cargoes**

  All practicable efforts should be made to ensure dangerous cargoes only remain within the port area for the minimum period necessary. The operator of the berth is responsible for ensuring that any handling of the dangerous goods is completed as soon as practicable after the vessel berths or the dangerous goods arrive on the berth and that the vessel does not remain at the berth for any longer than is reasonably necessary to complete any handling of the dangerous goods.

(iv) General requirements for the handling and transport of dangerous cargoes

1. Safety management system

AS 3846 requires the berth operator to prepare and implement a Safety Management System that provides a management framework for safely undertaking potentially hazardous activities, minimising the likelihood of incidents, managing occupational health and safety, and assisting in the protection of people, property and the environment.

A Safety Management System (AS 3846) is a documented system of policies, procedures and records that focuses on the management of risk (both identification and controls) in relation to operational and personnel safety.

2. Risk assessment

Before starting work the appropriate authorised and qualified personnel should determine the best way to carry out the activity safely, without impacting on people, property and the environment. OSH regulations make it compulsory for employers in all workplaces

to identify hazards and assess and control risks. Any potentially hazardous activity requires a job safety analysis (JSA) or a documented procedure.

AS 3846 requires formal risk assessments to be conducted in respect to some higher risk activities. A risk assessment process enables the identification, assessment and control of risks associated with dangerous cargoes. AS 3846 allows the application of formal risk assessments to support any variation from its requirements (subject to acceptance by the relevant regulatory authority) which leaves scope for equivalent measures or improvements to be justified through risk assessment. Therefore, if a particular dangerous cargo or activity involving a dangerous cargo is not specifically addressed in this standard or AS 3846, it must be assumed a formal risk assessment is required to establish appropriate requirements, limits or restrictions.

3. Emergency planning

Berth operators must ensure there is a written emergency plan for the site that documents the actions to be taken, procedures to be followed and information required to mitigate the consequences of a dangerous situation arising from the handling or transport of a dangerous cargo in a port area. The emergency plan must be developed in consultation with the Emergency Services and Fremantle Ports. All persons engaged in handling or transporting of dangerous cargoes in a port area must be aware of the emergency plan and competent in operating any necessary response equipment that they may be required to use.

The berth operator emergency plans must be submitted to Fremantle Ports to ensure that the plans align with the overall Fremantle Ports Incident Management Plan. The berth operator emergency plan must include the following:

First response - The berth operator is responsible for the initial emergency response. Berth operators have a designated area in which they are responsible for initiating the emergency response that begins when the dangerous goods have been accepted into the site and ends once the goods are removed or loaded onto vessel. Fremantle Ports will not be responsible for any containment or clean up; however, port specific information and incident management support will be available if required.

Notifications - The Department of Fire and Emergency Services must be notified of any emergency involving hazardous materials. The berth operator should notify Fremantle Ports (Port Security Centre on 9335 1300) of all of emergencies and incidents occurring within their operational area as soon as practicable.

4. Evacuation

OSH regulations require that an emergency evacuation procedure be prepared and where practicable, practised at reasonable intervals. The berth operator evacuation procedure should be self-sufficient and integrate with the port's major evacuation procedure outlined in Fremantle Ports Incident Management Plan.

5. Fire and emergency resources and personnel

Fire and emergency resources need to be appropriate for the type, class, packing group and quantity of dangerous cargoes. Firefighting equipment should be suitably identified and labelled, located and protected, readily available, accessible and maintained to appropriate standards and manufacturers' instructions. Where precautions for fire are in force the area should be clearly demarked by conspicuous notices. Persons at the workplace who would be required to help control or extinguish a fire at the workplace are appropriately trained and provided with appropriate protective clothing and equipment.

6. Training

Dangerous cargoes should only be handled by persons skilled in handling such cargoes, and by persons being trained who are supervised by a trained person. AS 3846 requires the berth operator to provide appropriate training (and refresher training) so that skilled personnel are employed in the handling of dangerous cargoes (and in the appropriate emergency procedures). The IMDG code provides mandatory obligations and training requirements for all shore-based personnel and managers dealing with dangerous goods (refer to IMDG Code Chapter 1.3 and training matrix 1.3.1.6).

7. Personal protective equipment, safety showers and eyewash facilities

Appropriate personal protective equipment must be readily available whenever dangerous cargoes are being handled. A safety shower and eyewash facilities must be

provided ready for use whenever toxic, corrosive or skin-sensitising substances are handled in bulk.

8. Placarding and transport documentation

For transport to and from the port area, a freight container of dangerous goods or explosives consigned for transport may be placarded in accordance with the IMDG Code and is exempt from 'marking' as per the ADG code. Documentation accompanying the dangerous cargoes (for delivery by land) must be in accordance with either the ADG or IMDG Code

9. Stowage and segregation

Containerised dangerous cargoes being prepared for transport by sea or being unloaded from a ship must be segregated in accordance with AS 3846.

The IMDG Code contains guidance on stowage, segregation and vessel requirements.

10. Hazardous area restrictions

Within a hazardous area, or within 25 metres of any place where flammable dangerous cargoes are present, no person shall create or use an ignition source, or have in their possession any matches, lighters, mobile phones, pagers, spark-generating equipment or ignition source, unless permitted by Fremantle Ports.

11. Smoking precautions

Smoking is only permitted in clearly marked areas declared safe by the master, berth operator or Harbour Master.

12. Hot work

Repairs involving hot work include open fires and flames, power tools, hot rivets, grinding, soldering, burning, cutting, welding or work that involves heat or creation of sparks which may lead to a hazard because of the presence or proximity of dangerous cargoes. Activities involving hot work must not be conducted within the limits of Fremantle Port without approval of the Harbour Master (request permission to conduct hot work) and must be carried out in accordance with AS 1674.1 and AS 1674.2.

13. Confined space entry

Any activity requiring personnel, other than the ship's crew, to enter a confined space must be conducted in accordance with AS 2865.

14. Communication

For the duration of dangerous cargo handling and bunkering operations, a reliable and effective means of communication must be in place between the ship and the berth operator.

15. Inspections and audits

The regulatory authority, Fremantle Ports and/or the berth operator must be granted access to a ship or berth at any time, to conduct inspections and audits.

16. Reporting incidents

Reporting of dangerous goods incidents is the responsibility of the berth operator or those otherwise responsible for the management of the dangerous goods involved. Dangerous goods incidents must be reported to the appropriate regulatory authority within 21 days.

17. Security Fremantle Ports has established water and landside restricted zones.

All port areas shall be appropriately secured at all times against unauthorised access. Access to operational areas is limited to specific or authorised persons. Personnel may require a Maritime Security Identification Card (MSIC) to access operational areas. Additionally, personnel handling dangerous goods at worksites need to consider whether they require a dangerous goods security card (DGSC). See the Department of Mines, Industry Regulation and Safety website (www.dmirs.wa.gov.au) for further guidance.

18. Storage

The storage of dangerous goods is not permitted within the berth and terminal areas (time limits are specified). Outside the berth and terminal areas AS 3846 does not apply.

19. Transport

All vehicles in the port area are expected to comply with the Road Traffic Code. Transport of dangerous cargoes by road and rail must be in accordance with the Dangerous Goods Safety (Road and Rail Transport of Non-Explosive) Regulations 2007 and the Australian Code for the Transport of Dangerous Goods by Road and Rail (ADG Code) or the Dangerous Goods Safety (Explosives) Regulations 2007 and the Australian Code for the Transport of Explosives by Road and Rail (AE Code).

The dangerous goods licencing regime includes licensing of drivers and registration of vehicles transporting dangerous goods. The explosives licensing regime includes licences for the driver, transport and import/export.

The transport regulations (Reg.183-186) require that a placarded dangerous goods load must be covered by an 'approved responder' to provide risk mitigation and clean-up services in response to dangerous situations resulting from incidents involving vehicles transporting dangerous goods appropriate to the class of dangerous goods being transported.

20. Dangerous goods site licensing and explosives licensing

Under the Dangerous Goods Safety (Explosives) Regulations 2007, the explosives licensing and authorisation regime includes licensing for import/export, transport, drivers and security cards.

Under the Dangerous Goods Safety (Storage and Handling of Non-explosives) Regulations 2007, all berth operators handling dangerous goods (except Class 1 explosives, Division 6.2 infectious substance, and Class 7 radioactive materials) must hold a current Dangerous Goods Site Licence. The regulatory regime is quantity based and the requirements increase at specified thresholds:

- A 'Placard quantity' requires the operator to provide site placarding, hazard identification, a site risk assessment and compliance checks to approved codes of practice (such as AS3846) as part of the risk assessment. Specific controls must be applied such as: separation of dangerous goods from protected places (e.g., offices, warehouses); segregation of incompatible dangerous goods; spillage containment; and fire protection.

- A 'Manifest quantity' requires the operator to hold a licence for the site; have a safety management system and provide an emergency manifest and emergency plan. Additionally, operators of licensed dangerous goods sites are required to prepare an Emergency Response Guide (FES-ERG) with the Department of Fire and Emergency Services.

(v) Specific requirements for dangerous cargo types

Class 5 – oxidising substances and organic peroxides

Class 5 oxidising substances and organic peroxides are reactive substances which are divided into two subdivisions. Division 5.1 is pertaining to Oxidising substances.

Division 5.1 - Oxidising substances

Oxidising substances or articles, in certain circumstances, directly or indirectly evolve oxygen; therefore, when they come into contact with combustible materials, they may increase the risk and intensity of fire and may lead to explosion. Mixtures of oxidising substances with combustible material are readily ignited, in some cases by friction or impact. Some oxidising substances can spontaneously ignite and explode without the presence of an ignition source due to rapid decomposition. Certain oxidising substances may react to evolved toxic gases when mixed with other substances or when they are involved in a fire. Oxidising substances should be separated at all times from heat, contamination, combustible substances and flammable goods.

The oxidising substances ammonium nitrate and calcium hypochlorite present specific risks. Their ability to decompose rapidly giving off toxic fumes and to explode under extreme conditions requires particular attention.

- Ammonium nitrate (AN) is a major component of many commercial explosives and fertilisers. AN alone is not an explosive, however, when mixed with the appropriate substances or contaminants it forms an explosive. It can also demonstrate explosive properties under the combination of extreme conditions of temperature, pressure and impact.

- Calcium hypochlorite is a common household item for owners of swimming pools. It is the most commonly used form of solid pool chlorine and its hazard is often underestimated due to its familiarity. Calcium hypochlorite decomposes

readily when contaminated, in contact with moisture or heated. Decomposition leads to the generation of toxic gases and heat and more rapid decomposition which can lead to explosion.

(vi) Special requirements for handling ammonium nitrate

Regulatory requirements for ammonium nitrate include:

- Quantities exceeding 30 tonnes of ammonium nitrate (AN) are considered Explosion Risk Goods and may only be loaded onto, or unloaded from, a vessel that is berthed at a special berth (non explosives). (S&H Regulation 135H)
- Applications for a declaration of special berth (non-explosives) are made to the Department of Mines, Industry Regulation and Safety (DMIRS) and must be accompanied by (i) an aerial photo, (ii) a risk assessment addressing all related handling and transport operations demonstrating appropriate controls, (iii) an implementation plan, (iv) an Emergency Plan for berth agreed to by the Harbour Master and (v) a fee. (S&H Regulation 135I)
- Classification documentation (i.e., evidence of analysis, test certificate or approved alternative) must accompany each shipment of AN exceeding 30 tonnes entering the port area. Classification documentation must be provided to the berth operator before AN handling operation commence. (S&H Regulation 135M)
- When more than 30 tonnes of AN are handled at a berth, safety requirements include: the berth must be clean and clear of combustible dust and debris; there is to be no bunkering, no smoking, no hot work, no handling of incompatible cargo, traffic must be controlled, unauthorised people and vehicles are excluded from the berth, firefighting equipment and water hoses must be run out and ready for immediate use; the ship's engines shall be kept ready at all times so that the ship can leave at short notice; once loading has begun it shall be completed and the ship shall put to sea as soon as is practicable. (S&H Regulations 135N, 135O)
- Handling operations must be completed as soon as practicable after the vessel berths or the goods arrive on the berth. (S&H Regulations 135G2, 135O5)
- A vessel must not remain at the berth for any longer than is reasonably necessary to complete any handling of the goods. (S&H Regulations 135G3, 135O6)

- If there are any non-compliances with regulations, failures to comply with procedures or failure of controls specified in the special berth risk assessment, the berth operator must provide a written report to the chief officer within 14 days of the handling operation. (S&H Regulations 135P)

(vii) Fremantle Ports' requirements for handling ammonium nitrate include:

- The quantity limits for ammonium nitrate refer to the maximum quantity permitted to be on board a vessel at a berth and/or the maximum quantity that may be handled in respect of any one vessel and/or the maximum total quantity that may be kept within a terminal area.
- Handling requirements as per AS 3846 Clause 6.6 requirements for handling ammonium nitrate at a special berth apply.
- Only one vessel may unload or load AN at the special berth at a time.
- AN vessels must be berthed a minimum distance of 25 metres from boundaries and 25 metres from dedicated AN holding areas.
- To minimise the risks associated with AN, the time these goods are held in the port area should be minimised.
- Holding areas: When more than 400 tonnes of AN are kept within a container terminal, the containers must be placed or stacked in a dedicated location or holding area, located at a minimum distance of 25 metres from site boundaries and special berths, and 15 metres from protected works.
- Container stacks: Stacks are limited to eight containers, no more than two high and two deep with the stack accessible from all sides and segregated from other containers or stacks of AN a minimum distance of five metres and other dangerous goods by a minimum distance of three metres.

(i) Class I Dangerous Goods Management Plan – Port of Melbourne (July 2022)

The purpose of this Ports Victoria Class 1 Dangerous Goods - Management Plan (the plan) is to provide guidance to a Master of a vessel, ship managers, terminal operators, Port of Melbourne Operations (Port of Melbourne) and other relevant parties on the responsibilities for the safe transfer and handling of Class 1 Dangerous Goods (explosives) as defined in the Dangerous Goods Act 1985 (Vic) in the port of Melbourne (the port).

The plan is to be carried out in compliance with:

- Dangerous Goods Act 1985 (Vic) (the Act)
- Dangerous Goods (Explosives) Regulations 2022 (Vic) (the regulations); and
- Australian Standard 3846:2005 - The handling and transport of dangerous cargoes in port areas (AS 3846).

With the introduction of the regulations, WorkSafe Victoria requires that all parties involved in the handling and transport of Class 1 Dangerous Goods through the port comply with Part 13 of the regulations and sections 2, 3 and 4 of AS 3846.

The parties involved in the safe handling and transport of Class 1 Dangerous Goods through the port all have areas of responsibility aligned with the activities they manage including the following mandatory safety requirements:

- The Ship manager/Master of the vessel must provide accurate timely information on the Class 1 Dangerous Goods to be shipped via Ports Victoria's 'Dangerous Goods Hub' (DG Hub) system at least 24 hours before loading onto the vessel.
- The Ship Manager/Master of the vessel and the Terminal Operator must ensure compliant compatibility and mixed stowage requirements by vessels in port areas to meet the requirements of AS 3846
- The Ship Manager/Master of the vessel and the Terminal Operator must ensure the separation distances from protected places and vessels carrying Class 1 Dangerous Goods meet the requirements of AS 3846
- Emergency management plans determined, implemented and tested to manage any potential emergency scenario.
- Assurance and/or monitoring programs to be undertaken by all stakeholders to check the application and compliance of the procedures as detailed in the plan.

Notes: Contravention of a regulation may constitute an offence under the Act.

(j) Canada

Dangerous goods are products or substances regulated under the Canada Shipping Act and the Transportation of Dangerous Goods Act (TDG).

Transport Canada is the organization responsible for the coordination of work while promoting public safety as related to the transportation of dangerous goods.

The following legislations/standards/terms is relevant to handling and storing ammonium nitrate:

a) Transport Canada
b) Canada Shipping Act
c) Transportation of Dangerous Goods Act
d) Natural Resources Canada

Import: Dangerous Goods that are being loaded onto the vessel. This is classified as handling.

Export: Dangerous Goods that are being unloaded from the vessel. This is classified as handling

In Transit: Dangerous Goods that are remaining onboard the vessel.

Storage: Dangerous Goods that are placed on the terminal awaiting its next mode of transportation in the supply chain for specific periods of time.

(k) Halifax Port Authority guidelines on Dangerous Goods

In respect to the guidelines surrounding the movement of Class 1, 5.1 (Ammonium Nitrate) and 7 Dangerous Goods through marine facilities, The Halifax Port Authority (HPA) requires advanced notification and pre-approval for all movements of Class 1, 5.1 (Ammonium Nitrate) and 7 Dangerous Goods applicable to import, export or in transit bookings. Notification shall be received and approved by HPA prior to Class 1, 5.1 (Ammonium Nitrate) and 7 Dangerous Goods being loaded onto a vessel calling Halifax.

All other Dangerous Goods must be submitted prior to vessel arrival and departure of the Port of Halifax.

Safety Requirements while in Port

- Class 1 Dangerous Goods are to be the first to be unloaded and the last to be loaded on the vessel. Class 1 Dangerous Goods are not to be unloaded from the vessel unless the means of transport are on the terminal and ready to receive.
- Storage is only permitted for Class 1.4 at the South End Container Terminal at specific locations. For more information contact the terminal operator, PSA Halifax.
- There is no storage permitted of Class 5.1 Ammonium Nitrate.
- Vessels carrying Class 1 Dangerous Goods are to be berthed with the bow oriented to sea.
- No hot work is permitted while Class 1 Dangerous Goods are being handled.
- No bunkering is permitted while the vessel is handling Class 1 Dangerous Goods.

The HPA is responsible to approve the Net Explosive Quantity (NEQ) of Class 1 and 5.1 (Ammonium Nitrate) Dangerous Goods through the Port of Halifax. Safe operation and handling is the responsibility of the Terminal Operator.

What is Required for Approval of Class 1 Dangerous Goods?

- The assigned Division Number and Compatibility Group Letter for the Class 1 Dangerous Goods. If there is more than one classification of Class 1 Dangerous Goods in the consignment, the Division Number and Compatibility Group Letter for each item must be indicated separately.
- The total NEQ of the Class 1 Dangerous Goods expressed in kilograms/container must be indicated. If there is more than one division of Class 1 Dangerous Goods in the consignment, the total NEQ expressed in kilograms for each different Division Number and Compatibility Group Letter must be indicated separately. Followings are required for Approval of Class 1 Dangerous Goods

  The Vessel name and Estimated Time of Arrival

  The Voyage number

  The cargo status must clearly indicate Import, Export or In Transit

The Port of Loading and the Port of Discharge

Container number and number of containers

The UN number

The declaration of dangerous goods

What is Required for Approval of Class 5.1 (Ammonium Nitrate) Dangerous Goods?

- The Class and UN number.
- The total weight of the Class 5.1 (Ammonium Nitrate) expressed in kilograms/container must be indicated.
- The Vessel name and Estimated Time of Arrival
- The Voyage number
- The cargo status must clearly indicate Import, Export or In Transit (retained on board). Storage on terminals are not permitted.
- The Port of Loading and the Port of Discharge
- Container number and number of containers
- The declaration of dangerous goods

10. FIELD OBSERVATIONS & RECOMMENDATIONS

Handling and transportation of Ammonium Nitrate

While field visit at M/s Visakhapatnam Port, unloading of Ammonium Nitrate (packed in jumbo bags of 900 kg each) was in progress at berth WQ 7. As per discussion, it was understood that usually the vessel carrying Ammonium Nitrate (AN) bags are berthed at EQ 1 to 5. However, due to non-availability of berth, it was taken on berth WQ 7.

Sl. No.	Subject	Observations	Recommendations
1	OSH & Environment Policy	The policy has been declared in 2020 and signed by the Chairman of Visakhapatnam Port	The policy has to be reviewed periodically and commitment of management towards handling ammonium nitrate in port

		Authority.	(explosive substance) shall also be the part of the policy.
2.	OSH Organisational Setup	There is no separate OSH organisation existing in the port. One safety officer and one safety supervisor are appointed and they are part of Traffic Department.	There should be separate OSH organisation to take care of safety and health aspects in the port. The OSH organisation shall be headed by the Senior Executive not below the rank of Dy. Chairman in view of the hazardous chemicals handled and increased rate of cargo handling in the port.
3.	Safety Manual for handling ammonium nitrate	Safety Manual for handling ammonium nitrate was not available in the port	Safety Manual for safe handling of ammonium nitrate shall be prepared and incorporated by the port authority and the same shall be circulated to all stakeholders involved in handling of ammonium nitrate in port and for other cargoes also.
4.	SOP for handling ammonium nitrate	SOP for handling ammonium nitrate has been prepared by the port authority	SOP shall be circulated to concerned such as stevedore, ship agent, importer and department/section of the port authority to know the procedures to be followed in handling ammonium nitrate. All concerned agencies and dock workers shall be trained to know and how to handle/follow SOP in handling ammonium nitrate.
5.	Work Permit System	Work permit system for handling ammonium nitrate is not existing	Work permit shall be given by the port authority for every shift of work in handling ammonium nitrate after ensuring wharf and

			ship is safe to work
6.	Safety Awareness and Training	Safety Awareness among the workers, crane operators, transport drivers and supervisors needs improvement	Awareness on safety and health in handling ammonium nitrate shall be ensured by the port authority. Training of all dock workers in handling ammonium nitrate shall be ensured by the port authority. Use of PPEs by the dock workers while handling ammonium nitrate shall be ensured.
7.	Fixed Fire Fighting System	There is no fixed fire fighting system in the wharf handling ammonium nitrate	Wharf area handling ammonium nitrate shall be provided with fixed fire fighting system and only fresh water shall be used for fire fighting.
8.	Receipt and transportation	Port authority has prepared mandatory check list document compliance by the stakeholder of the vessel carrying ammonium nitrate	The port authority shall ensure that import and transportation of the cargo is done strictly on stipulated license issued by the Statutory Authorities and its associated guidelines.
9.	Obtaining necessary permission/ clearance	Port authority has prepared mandatory check list document compliance by the stakeholder of the vessel carrying ammonium nitrate	Prior to arrival of ship carrying ammonium nitrate, necessary permission/clearance shall be obtained from concerned statutory authorities.
10.	Intimation of import and handling ammonium nitrate in port	Statutory authorities are informed by the port through a letter	Intimation about import and handling of ammonium nitrate shall be as per prescribed format under various rules/regulations applicable. The import shall intimate about the import of AN to the concerned

			authority well in advance under Rule 18 of the MSIHC Rules, 1989. Port Authority shall ensure that the master or officer-in-charge and the agent of the ship have informed the employer of the dock workers, Port Authority and the Inspector in writing about the dangerous goods as per Regulation 76 of the Dock Workers (Safety, Health and Welfare) Regulations, 1990.
11.	Facilities for unloading ammonium nitrate	There was not any fixed berth to handle Ammonium Nitrate bags. It is done as per availability of vacant berths.	Handling of Ammonium Nitrate shall be carried out only on dedicated berths and the berths shall be properly marked with warning signages. Entry of unauthorised workers/ visitors shall be prohibited.
12.	Barricading of ammonium nitrate handling area	The wharf handling ammonium nitrate area was not barricaded.	Designated place for handling ammonium nitrate shall be barricaded by suitable fencing to restrict the unauthorised movement of personnel in such area.
13.	Activities prior to unloading	Awareness of master and crew of the vessel is not adequate and observed that they handle the ammonium nitrate in very casually and not taking adequate steps to ensure the safety of cargo and deck/hold where the dock workers are employed.	Ship's hold containing ammonium nitrate jumbo bags shall be ventilated thoroughly and ensure it is free from any contaminants in the hold prior to commencement of discharging of such cargo. Port authority, importer and stevedore shall ensure that all precautionary measures have been taken by the vessel and ship's hold is safe to discharge the ammonium

			nitrate.
14.	Wharf Area handling ammonium nitrate	Wharf area handling ammonium nitrate was observed to have water accumulation due to rain.	All areas of a dock shall be kept maintained, properly drained, graded and good repair in order to facilitate safe handling of cargo and equipment as per Regulation 9 of the Dock Workers (Safety, Health and Welfare) Regulations, 1990.
15.	Restriction of unauthorised entry in to ammonium nitrate handling area	No security/ CISF personnel deployed at AN unloading area.	A dedicated CISF staff shall be deployed on the berth handling ammonium nitrate to restrict the entry of unauthorised persons to operational area.
16.	Prohibition of Hot work in ammonium nitrate handling area	No display of warning about danger due to smoking, hot work and restriction of such activities in the ammonium nitrate handling area.	Smoking/ hot work such as welding, heating, burning, repairing or any activity which may give chances of increase heat/ temperature shall not be allowed in the vicinity and area where the Ammonium Nitrate is handled. Warning about danger due to smoking, hot work and restriction of such activities in the ammonium nitrate handling area shall be displayed in wharf/port area.
17.	Physical condition of site	Tarpaulin covers were spread over the unloading point at the wharf area and there were accumulation of rain water.	It is not advisable to handle ammonium nitrate on rainy day. The stevedore and importer must ensure that wharf area is completely dry during unloading operation.

18.	Fire prevention measures	Fire tender along with fire trained personnel were available on site.	Trained fire fighting personnel along with fire tenders shall always be kept at alert mode during ammonium nitrate handling in port. Fire fighting facilities shall match with the fire load.
19.	Chances of cross contamination of AN.	Coal dust was found spread over on the wharf area. However, tarpaulin sheets were found to be spread over the handling site.	No other cargoes shall be stored or handled on the berths handling ammonium nitrate. The AN unloading /loading site shall be clear and free from traces of any other cargo. Preventive measures of Cross contamination of AN shall be kept into consideration.
20.	Separate supervisor and signaller on deck and as well as on wharf for every hook.	There was not separate supervisor and signaller on deck and as well as on wharf for every hook.	For every hook, there shall be a separate supervisor and signaller on deck and as well as on wharf while handling ammonium nitrate jumbo bags.
21.	Stacking of Ammonium Nitrate Bags at Wharf Area.	During the course of discharge of import Ammonium Nitrate in Jumbo Bags on the wharf, approx. 15-20 numbers of bags were stacked on the wharf.	As minimum as possible number of Ammonium Nitrate jumbo bags (preferably 10 numbers) shall be stacked on wharf area to reduce the intensity of risk and to proper accounting and from safety point of view.

22.	Ventilation	Informed by the importer that the AN Jumbo bags loaded on to the containers and transported to container loading area outside the port. AN Jumbo bags were loaded onto trucks and covered with tarpaulin sheets.	Unloaded ammonium nitrate jumbo bags shall be kept in well ventilated area and the same jumbo bags shall be immediately loaded in to trucks and transported from the wharf area.
23.	Handling of Ammonium Nitrate in night hours	Unloading of Ammonium Nitrate is done round the clock (even after sunset).	Handling of ammonium nitrate in dark hours shall be as per Rule 6(7) of the Ammonium Nitrate Rules, 2012.
24.	HAZCOM	During interaction with master of the vessel and crew members, it is observed that they were not much aware of the hazards associated with stowage and discharging of ammonium nitrate. Workers engaged for the job were not aware of its associated hazards, in case of damage to the bags and chemical cargo handled by them.	Hazard communication shall be made effectively prior to handling of Ammonium Nitrate jumbo bags in Port. The drivers employed for transportation of ammonium nitrate shall be trained on safety in transportation of hazardous materials.
25.	Spill management	There was spillage of ammonium nitrate on main deck and found wet due to rain.	There must be a strict spill management plan. Separate guidelines and SOP shall be in place for re-collecting the spill Ammonium Nitrate.
26.	Sweeping and clearance of AN	When spillage of AN (on deck) was brought in to	The spilled cargo should be swept out separately and cleared away

	spill	notice of the stevedore, it was collected (using iron shovel) by a casual worker with bare hand.	immediately by the skilled and trained personnel in consultation with the importer. In the event of spillage of this cargo, such spillage should not be rolled over by weight or any such method. And, if spilled Ammonium Nitrate is not contaminated may be transferred expeditiously to licensee after proper accounting.
27.	Use of sharp hooks/ edges etc.	Iron shovel was used to clear the spilled Ammonium Nitrate on deck.	In no case any sharp hooks/ edges shall be used to carry Ammonium Nitrate jumbo bags.
28.	Test/ examination certificates of Mobile cranes used in dock work	Mobile cranes, used for loading of AN bags on to the trucks crane test/ examination certificates or cargo gear book were not available.	Lifting appliances and loose gears used (on-board/ on-shore) for handling Ammonium Nitrate shall be tested and thoroughly examined in accordance with the requirements of the Dock Workers (Safety, Health and Welfare) Regulations, 1990. Test and annual thorough examination certificates of lifting appliances and loose gears used on shore shall be kept readily available.
29.	Valid driving license to transport Hazardous substances.	In few of the cases, license of the driver to carry Hazardous substance was not valid. Whereas, driving licenses were found valid.	Validity of driving license for transportation of Hazardous substances shall be ensured in respect of all the truck drivers entering at the port to carry AN bags.
30.	Transportation of Ammonium	There were no dedicated transports meeting	Ammonium Nitrate shall not be transported with any other

	Nitrate jumbo Bags	requirements to transport explosives or dangerous goods such as ammonium nitrate. Transport equipment were not fitted with spark arrester and appropriate portable fire extinguishers. Drivers were not aware of dangers involved in ammonium nitrate.	explosives, inflammable substances, oil, gases, carbonaceous matter, etc. Transportation of Ammonium Nitrate shall be done directly to the destination without any interim storage in compliance to the requirements of the Statutory Authorities. Transport equipment shall be fitted with spark arrester and appropriate portable fire extinguishers. Trucks shall be checked for such fittings before entry of trucks into port by the concerned authority and the drivers shall be well conversant with use of fire extinguishers. The cargo loaded onto the trucks/ Lorries shall be taken for delivery directly from the hook point to the destination. No interim stoppage of transport carrying ammonium nitrate bags on en-route from unloading point (dedicated berth) and up to the port custom boundary.
31.	Trained personnel to regulate the movement of vehicles on wharf.	No designated trained personnel to regulate the movement of vehicles on wharf were observed.	Trained personnel shall be engaged to regulate the movement of vehicles on wharf. Earmarked roadways shall be used for transporting Ammonium Nitrate jumbo bags
32.	Proper usage of PPEs	PPEs were not provided to the workers engaged and also the dock workers.	Dock Workers engaged in handling ammonium nitrate shall be supplied with suitable PPEs meeting BIS Standards and usage of the same shall be ensured by a

			responsible person/ employer of the dock workers.
33.	Safety shower and eyewash facilities	Safety shower and eyewash facilities were not provided in wharf area where ammonium nitrate is handled.	A safety shower and eyewash facilities must be provided ready for use whenever toxic, corrosive or skin-sensitising substances are handled.
34.	Training to the drivers	Truck drivers were not trained on safety in handling of ammonium nitrate.	The drivers employed for transportation of ammonium nitrate shall be trained on safety in transportation of hazardous materials.
35.	Training of workers	Workers were found not to be adequately trained to handle Ammonium Nitrate bags.	The dock workers shall be trained in accordance with the requirement of MSDS. They should be well aware of the hazards associated with such cargo.
36.	Medical examination of the dock workers	Register for medical examination of the dock workers employed by the stevedore and the importer was not produced for verification	Workers employed in dock work shall be ensured to be physically fit and medically examined as required under Reg 107 of Dock Workers (Safety, Health & Welfare) Reg. 1990. Register for medical examination of dock workers shall be maintained by the employer of the dock workers.
37.	Display of Material Safety Data Sheet(MSDS) / Do's & Don'ts	MSDS/ Do's & Don'ts was not displayed adequately on wharf area.	Material Safety Data Sheet (MSDS) for ammonium nitrate shall be displayed in wharf area in English and the language understood by the majority of the dock workers involved in handling

			ammonium nitrate.
38.	HAZAN / JSA	Port has prepared Practices and procedures to handle AN at the Port.	Hazard analysis shall be made at every time, prior to arrival of ship carrying Ammonium Nitrate bags at the port. Job Safety Analysis (JSA) shall be conducted for handling ammonium nitrate inside the port.
39.	Quantitative Risk Assessment (QRA) and consequence modelling	Port has prepared Practices and procedures to handle AN at the Port.	Quantitative Risk Assessment (QRA) and consequence modelling for handling ammonium nitrate shall be prepared by the port authority.
40.	Emergency Action Plan	Emergency action plan has not been prepared as required under the Dock Workers (Safety, Health and Welfare) Regulations, 1990.	Emergency Action Plans shall be prepared and reviewed periodically by the port authority as per Regulation 112 of the Dock Workers (Safety, Health and Welfare) Regulations, 1990.
41.	Preparation of Safety Report	Port has prepared Practices and procedures to handle AN at the Port.	Safety Report as per the Schedule 8 of the MSIHC Rules, 1989 shall be prepared for handling ammonium nitrate and reviewed periodically as and when required.
42.	Safety and Security Management Plan	Safety and Security Management Plan has not been prepared by the importer/stevedore/port authority as required under	Port authority/ stevedore / importer shall submit Safety and Security Management Plan to the licensing authority and to the District Authority with the security aspect

		the Ammonium Nitrate Rules, 2012	duly endorsed by the Superintendent of Police or Deputy Superintendent of Police as per Rule 15 of the Ammonium Nitrate Rules, 2012.
43.	Fire and emergency mock drill	Port conducts fire and emergency mock drill periodically.	Fire and emergency mock drill as per the on-site emergency plan shall be conducted, periodically as stipulated under the MSIHC Rules, 1989.
44.	Compliance of provisions under the Ammonium Nitrate Rules, 2012 framed under the Explosives Act, 1884.	Compliance of provisions of the Ammonium Nitrate Rules, 2012 by the port authority, stevedore, agent and importer is not adequate	Provisions of the Ammonium Nitrate Rules, 2012 shall be complied by the all stakeholders as applicable.
45	Safety Audit	Periodical Safety Audits are not conducted at VPA and documents on compliance to the recommendations are not maintained.	Safety Audit for the VPA with specific focus on Ammonium Nitrate Handling and storage shall be conducted once in every year and compliances in connection with the recommendations of the Audit documented
46	Legal Compliances	The applicable Legal Compliances shall be made. In accordance with the requirements of the applicable statues.	Before commencement of handling of Ammonium Nitrate permission shall be obtained from the applicable statutory Authorities so as to ensure the Safety in handling and transportation of Ammonium Nitrate within the custom bound area of the VPA.
47	Site Notification	Handling of Ammonium Nitrate exceeds the	VPA is handling huge quantity of Ammonium Nitrate as per the

		threshold quantities as mentioned in MSIHC Rules 1989	prevailing statistics, and exceeded the threshold quantities as mentioned under schedule 2 of S.No.3 and S.No 4.Hence the site notification shall be carried out by the VPA at the earliest as per the requirement of MSIHC Rules 1989.

11. CONCLUSION: -

Safety audit is a methodological, independent and typically a periodic examination technique involving analysis and confirmation of local procedures and practices.

Following a request from the management of M/s Visakhapatnam Port Authority, Safety audit for handling and transportation of Ammonium Nitrate was conducted by DGFASLI Audit team.

As a part of the Safety Audit, the team made a field visit during which it visited the site, where handling of Ammonium Nitrate was in progress, and examined critically the working conditions, work practices, availability of fire prevention strategies, prevailing system of documentation and the material handling equipment in order to identify and evaluate the hazard potential. The deviations from the safe system of work are recorded for taking corrective measures.

The scope of this safety audit was limited to assess the safety and health of workers employed in the handling & transportation of Ammonium Nitrate and safety of the equipment used in the process.

The overall impression of the audit team about the practices and procedures developed, precautionary measures adopted by VPA was satisfactory.

However, incorporating certain safe practices at worksite as discussed in observation and recommendation chapter may result safer handling and transportation of Ammonium Nitrate. Preparation of QRA and consequence modelling for handling Ammonium Nitrate at Port site will elaborate the scope of safety at work.

12. REFERENCES

1.	Code of Practices on Occupational Safety and Health Audit No.15-14489:2018, Bureau of Indian Standards, New Delhi
2.	Guide to Safety Audits – Published and recommended by the Chemical Industrial Associations, Alembic House, 93, Albert Embankment, London SE 17 TU, U. K.
3.	Occupational Health Audit Questionnaire from DGFASLI, Mumbai.
4.	The Dock Workers (Safety, Health & Welfare) Regulations, 1990
5.	Ammonium Nitrate Rules, 2012
6.	The Manufacture, Storage and Import of Hazardous Chemical (MSIHC) Rules, 1989
7.	ILO Guide on Safety in Ports
8.	International Maritime Dangerous Goods (IMDG) Code
9.	Material Safety Data Sheet – Ammonium Nitrate
10.	Chemical Advisory: Safe Storage, Handling, and Management of Solid Ammonium Nitrate Prills- OSHA – June 2015
11.	https://www.worksafe.qld.gov.au/safety-and-prevention/hazards/hazardous-chemicals/specific-hazardous-chemicals/ammonium-nitrate/ammonium-nitrate-storage-and-handling
12.	HSE Guidelines on Storing and Handling Ammonium Nitrate

13. ANNEXURES

Annexure I

Safety Audit Questionnaire

A separate filled-in safety audit questionnaire is enclosed at the end of the report.

SAFETY AUDIT QUESTIONNAIRE

C-1. OH & S MANAGEMENT	
C-1.1 OH & S Policy	
a) Does the organization have OH & S policy?	YES
b) Who has signed the OH & S policy?	Chairman , Visakhapatnam Port Authority
c) Whether the OH & S policy is per guidelines ofthe statutory provisions?	YES
d) When was the OH & S policy declared andadopted?	Declared and adopted on 2003
e).Whether the OH & S policy reviewed periodically?	Yes. By the Core group committee constituted by Chairman.
f) Whether the OH & S policy is available in locallanguage and made known to all?	YES. To port employees and Port users.
g) What was the last date of updation?	26-10-2020
h) Does the policy find a place in the annual report?	YES
C-2-OH & S ORGANIZATIONAL SET UP	
C-2.1 Safety Department	
a) Does the factory have a safety department and what is strength of safety department?	YES, STRENGTH-2 in safety wing. Also Under OHSMS system Every dept has designated team for implementation of safety requirements and rolls are defined.
b) Whether the strength and qualifications of Safety Officers are as per the statutes?	YES
c) Does the head of safety department report to the Chief Executive?	YES
d) How often are the safety officers retrained in the latest techniques of total safety management? What is the frequency of retraining?	As per the training program designed by HRDC from time to time.
e) What additional duties the safety officer is requiredto do?	Assigned only to look after the operational safety requirements with the Departments.
f) What is the power of safety officer vis-a-vis unsafe condition or unsafe act?	To stop work activity if found unsafe act and unsafe condition
C-2.2 Safety Committee(s)	
a) Does the factory has a safety committee(s)? What are the types, structures and terms of reference ofthe committees?	YES, port safety committee formed by all HOD's, trade unions, PSC members and shop floor safety committee Constituted by the Chairman to comply with the relevant regulations.
b) Are the recommendations of the committees(s) implemented?	Yes. And also monitored by the Top management Under OHSMS system.
c) Are the minutes of the safety committee(s) meetings	Yes

circulated among the members?	
d) Is the constitution of the safety committee(s) as per the statute?	Yes
e) How are the members of safety committee(s) selected? (elected / nominated)	Nominated from each department by the Management and by Trade Unions
f) How often are the meetings of safety committee(s)held?	Shop floor committee - Once in every month Apex safety committee – Quarterly.
g) Are the minutes forwarded to the trade union(s) and chief executive and occupier?	Yes
h) Whether the management and trade union play their active roles in supporting and accepting the committee(s) recommendations?	Yes. Detailed discussions will be held with the management.
i) How are the safety committee(s) members apprised of the latest development in safety, healthand environment?	They apprised in every year safety day celebrations
C-2.3 Safety Budget	
a) What is the annual safety budget?	There is no limit for safety budget.
b) How much percentage is this budget of the total turnover of the company?	Management will spend as and when required.
c) How much budget has been utilized till date?	Approximately 65 laks per Annam
d) Is the safety budget adequate?	YES
e) How is the safety budget arrived at?	As per the requirement of Safety department
f) What is the pattern of expenditure for the last five years?	Fully utilize the budget and budget also increased
g) What are the approved sanctions for theexpenditure in this budget?	As per approved budget heads.
h) Does this budget get reflected in the annual report of the company?	YES
C-2 SAFETY MANUAL	
a) What is the periodicity of updation / review of safety manual?	Every year and as and when required
b) Does the safety manual adequately address all the hazards in the plant?	YES
c) Are the employee made aware of safety rules / instruction mentioned in the safety manual?	YES
C-3 STANDARD OPERATING PROCEDURES(SOP)	
a) Are written Standard / safe operating procedures available for all operations and processes?	YES. Documented, reviewed in internal audits and being implemented.
b) Whether the written Standard / safe operating procedures are displayed or made available and explained in the local language to the workers?	YES. Recorded and photographs made available.

c) Whether concerned section and safety department prepares standard / safe operating procedure jointly?	YES
d) Are standard / safe operating procedures reviewed and updated?	YES
e) Have the workers been informed of the consequences of failure to observe the standard / safe operating procedures?	YES. In every shift starting at port operations.
C-5 PLANT MODIFICATION PROCEDURES	
a) What is the system for effecting any change in the existing plant, equipment or process?	By HIRA / Job safety analysis under OHSMS systems.
b) Whether the P & I diagrams and other related documents are updated accordingly?	YES
c) Whether hazard assessment done before implementation of modification?	YES. Feasibility studies and impact assessments by the out sourced Expert agencies.
C-6 WORK PERMIT SYSTEM	
a) What types of work permits exist in the factory?	Cold work, Hot work, confined space, Height work, excavation work etc
b) Are the necessary forms detailing required safety precautions have been prepared and used for eachtype of work-permit?	YES
c) Is the responsibility assigned to authorized person for issuing of safety work permit?	YES
d) Is the copy of safe work permit sent to safety officer before execution of the job?	YES
e) Is validity period specified in the safety workpermit?	YES
f) Are the records of work permit available and maintained in proper order?	YES
C- 6.1 CONTROL MEASURES FOR WORK AT HEIGHT	
a) Is adequate safe access provided to all places where workers need to work?	YES
b) Are all such access in good condition?	YES
c) Are all scaffolds are properly designed anderected?	YES
d) Are scaffolds inspected every day before workbegins?	YES
e) Are ladders securely clamped or lashed in place?	YES
f) Are planks in good condition?	YES
g) Are scaffold walkaways, platforms, runs or stairs free of debris, grease, any unnecessary obstructionand projecting nails?	YES
h) Are the scaffolds higher than 20 m.? If yes, is a netting or intermediate railing provided between toe-boards and hand railings?	YES
i) Are folding stepladders properly used?	YES
j) Are ladders set up at the proper slope of about 1:4?	YES
k) Do workers use hand lines to lift tools or materials?	YES

l) Are proper ladders used around electrical hazards?	YES
m) On sloping roofs, are crawling boards, lifelines, safety belts and edge protection provided where needed?	YES
n) Whether the weak spots, skylights, or deteriorated asbestos-cement boards through which a worker might	YES
o) fall while working in the roof has been identified and safety net provided appropriately?	YES
p) Are the workers being medically examined for their fitness to work at height?	YES
C-6.2 WORK IN CONFINED SPACE	
a) Is work permit system followed for working in confined space?	Yes.
b) Whether monitoring of the atmosphere inside the confined space is carried out and ensured that there is no flammable or toxic gas in the area?	YES. Fumigation and Gas free tests are Done as required.
c) Whether the person entering the confined space is using suitable personal protective equipment (PPE)?	YES. Look out duties also allocated.
d) Is rescue team available in case of any emergency?	YES at the site.
C-7.CONTRACTORS' SAFETY SYSTEM	
a) Is there any system for selection of contractors?	YES
b) Are there any guidelines on contractor's safety and training?	YES
c) Whether contract document includes necessarysafety and welfare clauses as per statutes?	YES
d) Is there any programme to ensure use of PPE by contractors personnel?	YES, Continuous training given to contract personnel.
e) Do the contractors have their own safety organization?	YES
f) Are the contractors reporting all accidents and injuries	YES
g) Are contractor workers trained to observe safety atwork place?	YES
h) Whether contractor workers are engaged in process / operations? If yes, are they aware of safe operating procedures?	YES, Tool box talk compulsory for each before starting
C-8. PLANT DESIGN AND LAYOUT	
a) Whether hazardous operations in the plant are segregated?	YES
b) Whether the plant layout has taken care of the movement of firefighting equipment and emergency exits?	YES
c) Whether occupational health & safety aspects are considered during the design?	YES
d) Are all the equipment provided with adequate space for working, maintenance etc.?	YES

e) Are the storage tanks provided with enough space /clearance between them?	YES
C-9. MEDICAL MANAGEMENT OF ACCI-DENTS	
a) Are medical facilities available with trained first aid staff and equipment in round the clock shift for all including contractors?	YES
b) Is the ambulance van available for round the clockbasis with the dedicated driver?	YES
c) Is there any mutual aid scheme available withthe nearest hospitals to manage and treat injuries during emergency?	Port Hospital just 0.5KM away from port. We can send the person for treatment at any time
d) Are the workers / contractor workers aware of emergency medical facilities?	YES
C-10. MANAGEMENT OF EMERGENCIES(NATURAL / MAN-MADE)	
a) Does the system exist to detect and control these Emergencies?	YES. With organized Emergency Prepared ness. Rolls and responsibilities are defined.
b) Are the employees aware of the measures to be taken during emergencies?	YES
C-11. EMPLOYEES SELECTION AND PLACE-MENT	
a) Whether norms are available for selection of different category of employees?	YES
b) Whether pre-employment medical examination is being conducted for employees?	YES
c) Is there any procedure to evaluate safety awareness and record of the employees during their promotion?	Different awareness training conducted for employees and record maintained
C-12. SAFETY CULTURE	
C-12.1 Attitudes of Managers	
a) Do the managers follow the plant safety rules at alltimes?	YES
b) What are their attitudes towards safety reviews and audits?	Positive
c) What is the response of management to safety violation?	Compliance and not repetitive
d) Whether safety related decisions are taken in consultation with the workers?	YES
e) What is the attitude of the managers towards non use of personal protective equipment?	We follow safety PPE mandatory
C-12.2 Attitudes of Workers	
a) Whether workers are aware of the consequences of their wrong actions?	YES
b) Are laid down safe working procedures followedstrictly?	YES
c) What is the attitude of the workers towards their own mistake, which can prejudice safety?	Positive
d) Do the workers report near miss incidents and suggest safety improvements	YES

e) Are the workers aware of the system of rewards and sanctions relating to safety matters?	YES
f) What is the attitude of workers towards use of personal protective equipment?	Positive
C-13. STATUTORY LICENSES, APPROVALS AND RECORDS	
a) Whether all the safety related Acts / Rules (with latest amendments) applicable to your organization identified, informed to all employees and complied?	YES
b) Whether the licences have been validated?	YES
C-14. MOTIVATIONAL AND PROMOTIONAL MEASURES FOR OH & S	
a) Does the factory have occupational health and safety suggestion scheme?	YES, We have collected the safety suggestion from employees and implemented
b) Are occupational health and safety contests organized in the factory?	YES
c) Does the factory participate in National Awards?	YES
d) Has the factory been awarded during last five years?	Yes with Greentech Safety Awards.
e) Does the organization publish safety bulletin / newsletters?	Yes. Ex. Covid awareness under Occupational Health measures at work spots
f) Whether the safety bulletins are widely distributed?	YES
g) How is the occupational health and safety information including accident statistics disseminated in the factory? (Bulletin boards, Newsletter etc.)	Bulletin boards
h) What are the activities conducted during National Safety day / week?	Conducting Safety Pledge in all Departments / sections, conducting awareness about recent incidents occurred at various work locations and conducting Street Plays , conducting various competetions to all Port employees along with stack holders. Contractor workers briefing on Emergency preparedness and sharing of activities of safety week Inspection of Emergency safety equipments Domestic Safety awareness sesión for colony children Domestic Safety awareness sesións for women employees members awarded , Best contract employee, Best workman etc.
i) What is the percentage of Workers participating inthe various safety promotional activities?	100%
C-15. HAZARD IDENTIFICATION AND JOB SAFETY ANALYSIS	
a) Was an initial process hazard analysis (PHA) completed?	YES
b) What are the stages of PHA? Whether a dedicated group is identified for PHA?	YES

c) Was the PHA appropriate for the complexity of the process and identify, evaluate, and control thehazards involved in the process?	YES
d) Does the hazard evaluation use one or more of the following PHA methodologies: What-If Analysis, Process Checklist, Hazard and Operability Study (HAZOP), Failure Mode and Effects Criticality Analysis (FMECA), Fault Tree Analysis (FTA) or any other appropriate equivalent methodology?	YES
e) Does PHA assures addressing issues of inherent safety features with respect to material and their properties?	YES
f) Does the PHA address the hazard identification, incidents history, consequences of failures (engineering and administrative controls), human factors, consequent analysis with respect to possible safety and health effects of failure of controls?	YES
g) What are the stages of PHA? Whether a dedicated group is identified for PHA?	YES
h) Does the system exists to promptly address findings and recommendations of PHA?	YES
i) Are the PHA's updated and revalidated at least every five years by a qualified team to assure thatthe PHA is consistent with the current process?	YES
j) Whether the activities requiring Job Safety Analysis have been identified?	YES
k) Whether the identified jobs for Hazard Identification have been carried out by trained andexperienced persons?	YES
l) Whether the checklists have been prepared oneach Job Safety Analysis and are being used whilecarrying out the job?	YES
C-16. PRODUCT SAFETY	
a) Whether hazards arising from use of the products are identified?	YES
b) Whether material safety data sheet prepared for the products?	YES, material safety data sheet prepared forthe products?
c) Are all the products labeled and packedappropriately?	YES
d) Whether safety instructions are given along withproducts?	YES
e) Whether policy exists for recall of products?	YES
C-17. SAFETY TRAINING	
a) Whether training needs have been identified?	YES
b) Is there any programme of induction training, itsduration and topics covered?	YES
c) Whether the assessment of the trainees has been carried out?	YES
d) What are the infra-structural facilities availablefor training?	There are three training halls available for training. Teaching aids are placed.

e) Whether training is conducted by qualified person?	YES
f) Whether trainers are being re-trained from time to time?	YES
g) Whether proper records of training program conducted are maintained?	YES
h) How training programs are evaluated?	Pre Test and post Test
i) Whether schedule for training on occupational health and safety is available and maintained?	YES
j) Whether the training programmes are reviewed?	YES
k) Are all the employees periodically trained / retrained and what is the frequency of such training?	Yes
l) Are the retraining needs identified whenever a new process / products and change in existing process introduced?	YES
m)Whether training covers top management?	YES
n) How many hours of safety training is given to different employees?	
C-18. CHANGE MANAGEMENT	
C-18.1 Management of Change	
a) Are there written procedures for managing change to process chemicals, technology, equipment and procedures and changes to facilities that affect the plant process / system operation?	YES
b) Do the procedures assure that the technical basis for the proposed change addressed prior to any change?	YES
c) Do the procedures assure that the impact of the change on safety and health addressed prior to any change?	YES
d) Do the procedures assure that modifications to operating procedures are addressed prior to any change?	YES
e) Do the procedures assure that the necessary time period for the change is addressed prior to any change?	YES
f) Do the procedures assure that the authorization requirements for the proposed change are addressed prior to any change?	YES
g) Are employees involved in operating a process, and maintenance and contract employees whose job tasks will be affected by change informed of, and trained in, the change prior to the start-up of process or affected part of process / operations?	YES
h) Is the safety information is reviewed and updated on changes?	YES
i) Are the operating procedures or practices updated?	
C-18.2 Mechanical Integrity	
a) Does the mechanical integrity program includefor all	YES

mechanical equipment including pressure vessels and storage tanks, piping and components, relief devices and vent systems, emergency shutdown systems, pumps, control systems?	
b) Are there written procedures to maintain the on- going integrity of process equipment?	YES
c) Whether training been provided to each employee involved in maintaining the on-going integrity of process equipment?	YES
d) Are inspections and tests performed on each item of process equipment included in the program?	YES
e) Does the inspection and test frequencies meet the manufacturer's recommendation and good engineering practice?	YES
f) Are inspections and tests performed more frequently if determined necessary by operating experience?	YES
g) Are deficiencies in equipment that are outside limits corrected before further use so as to assure safe operation?	YES
h) In the construction of new plants and equipment, whether quality assurance programme is implemented to ensure that equipment fabricated is suitable for the process?	YES
i) Are appropriate checks and inspections made during equipment installation stage?	YES
j) Are the suitability of maintenance materials, spare parts and equipment ensured during maintenance?	YES
C-19 PHYSICAL HAZARD	
C-19.1 Housekeeping	
a) Are all the passages, floors and the stairways in good condition?	YES
b) Is glass door taped or otherwise marked to make it visible to workers?	YES
c) Do you have the system to deal with the spillage?	YES
d) Do you have sufficient disposable bins clearly marked and whether these are suitably located? Are containers of refuse (waste) and trash emptied at the end of every day or soon after they are full? Are the containers or bins regularly cleaned?	YES
e) Are drip trays positioned wherever necessary?	YES
f) Do you have adequate localized extraction and scrubbing facilities for dust, fumes and gases?Please specify.	YES
g) Whether walkways are clearly marked and free from obstruction?	YES
h) Do you have any inter-departmental competition for good housekeeping?	YES

i) Has your organization elaborated good housekeeping practices and standards and made them known to the employees?	YES
j) Are there any working conditions, which make the floors slippery? If so, what measures are taken to make them safe?	NO
k) Does the company have adequate measures to suppress polluting dust arising out of materials stored on the roadside?	YES
C-19.2 Machine and General Area Guarding	
a) Whether machinery and equipment which can cause physical injuries to operator have been identified?	YES
b) Are all moving parts and point of operation of machinery adequately guarded?	YES
c) Are all fixed guards securely bolted in position and in good condition?	YES
d) Are all interlock guards for prevention of physicalinjury in good condition?	YES
e) Are all emergency stop buttons effective and clearly labeled?	YES
f) Are the operators for machines having moving parts aware of the danger of working with loose clothing?	YES
g) Are the openings where there is free fall hazard covered or fenced securely?	YES
C-19.3 Material Handling	
a) Are adequate equipment available for handling materials?	YES
b) Are the workers aware of the hazards associated with material being handled?	YES
c) Where manual handling is necessary, are the workers been trained? Do they practice this? Are workers warned for lifting of excessive weight? (Maximum weight of material for adult male and female are 55 Kg and 30 Kg respectively)	YES
d) Do workers follow safe procedures for storage of materials?	YES
e) Is the register maintained to record particulars of examination of all lifting machines, tools and tackles?	YES
f) Are all the statutory examinations and tests carried out and certified by competent person(s)?	YES
g) Are the operators of crane, lifts, hoists and other mechanized operations adequately qualified?	YES
h) Is the safe working load clearly marked?	YES
i) Has the person employed to operate crane, forklift, or to give signals to crane been medically examined for eyesight and colour vision?	YES
j) Is the frequency of eyesight and colour vision examination as per the latest rules?	YES

C-19.4 Electrical Safeguarding	
a) Are licensed electricians available for electrical work?	YES
b) Whether area classification for electrical equipment has been carried out?	YES
c) Do the electrical fittings conform to area classification for electrical equipment?	YES
d) Is a ground fault current interrupter system (ELCB) in use?	YES
e) Are all connections made by using appropriate plugs, receptacles or enclosures? Are fuses provided?	YES
f) Are there any make shift connection bare wires or damaged cables?	NO
g) Is there a system of ensuring periodical inspection of hand tools, extension boards used for electrical work?	YES
h) Do the workers use proper types of PPE during the working on live line?	YES
i) Is the separate work permit issued for working on high voltage line?	NO
j) Whether the process(s) and equipment that generate and accumulate static charge have been identified?	YES
k) Whether all such equipment including pipelines for flammable materials are properly bonded and earthed?	YES
l) Whether earth pit resistance is measured and the record maintained?	YES
m)Whether lightning arrestor has been installed and is adequate?	YES
C-19.5 Safety in Storage and Warehousing	
a) Whether the Material Safety Data Sheet for all chemicals is available?	YES
b) Are the chemicals stored as per their hazardous properties including the incompatibility?	YES
c) Are all containers clearly, indelibly labelled? Are all chemicals stored as per safety regulations?	YES
d) Whether all racks and steel cages have sufficient load bearing capacity?	YES
e) Is adequate natural ventilation provided to store room? Is there any emergency exit?	YES
f) Whether adequate firefighting arrangement existing in flammable chemical storage?	YES
g) Whether methodology for handling spillages of hazardous chemical available along with the equipment required handling the spillage?	YES
h) Whether aisles are marked and emergency exits displayed?	YES
C-19.6 Hazard Assessment for New Equipment	

a) What is the system for effecting any change in the existing plant, equipment?	Well established system is designed and documented 1. Feasibility study of equipment. 2.job safety analysis under OHS&MS
b) Is there system for evaluating hazards from newequipment?	YES
c) Whether the P and I diagrams and other related documents are updated accordingly?	YES
d) Is any Job Hazard Analysis (JHA) carried out afterinstallation of new equipment?	YES
C-19.7 Hazards from Radiation Sources	
a) Whether licences have been obtained for storage /handling of radioactive material?	We do not have any radioactive material
b) Whether approved Radiological Safety Officer appointed?	NA
c) Whether appropriate PPEs are used againstradiation hazards?	NA
d) Is the flooring of the radioactive material handling area amenable for proper decontamination?	NA
e) Is the storage room of radiation source as per the licence condition?	NA
f) Are all persons working in the facility have radiation safety training?	NA
g) Is the operators handling devices using radioactive materials qualified and possess the necessary certificate?	NA
g) Is the periodical radiation monitoring carried out?	NA
h) Are the records of inventory of radioactive material maintained in the standard format and submitted to the competent authority as per the period specified?	NA
i) Are emergency handling tools available?	NA
j) Are the personnel monitoring badges (TLD, Pocket dosimeter etc.) assigned and worn by each radiation worker?	NA
k) Are the radiation symbol and red light displayed as required?	NA
C-20 CHEMICAL HAZARD	
C-20.1 Transportation of Hazardous Substances	
a) What potentially hazardous materials are transported to or from the site (including wastes)	POL's and LPG through safe pipe line systems.
b) What mode of transport are used? 1. Road, 2. Rail, and 3. Pipelines	Road Pipe lines.
I) Road i) Does the company employ licenced vehicle of its own / outside sources? ii) Are the loading / unloading procedures in place	i. Outside sources ii. YES iii. YES iv. YES

and safety precautions displayed? iii) Is there a provision to check the healthiness of road tanker with respect to explosives rules? iv)Are loaded tankers or trucks parked in a specific area on-site? v) Do all truck and tanker drivers carry transport emergency (TREM) card or instruction booklet? vi)Do all truck and tanker drivers get training in handling emergencies during transport? vii) Are all the tankers marked for proper Hazchem code?	v. YES vi. YES vii. YES
2) Rail i) What hazardous materials are transported by rail? ii) Does the company have a direct siding onsite? iii) Are tankers or other wagons used in transportation?	NA
3) Pipelines i) What materials are transported to and from the site by pipelines? ii) Are the pipelines underground or over ground? i) Are corrosion protection measures employed in pipelines? ii) Whether intermediate booster pumps are used? iii) What is the maximum, minimum and average transfer rates? iv) Are the pipelines extended in the public domain? v) Are the pipelines dedicated for each type of chemicals? vi) Are the pipelines fitted with safety equipment such as leak detectors, automatic shut-off valves etc.? vii) What is the frequency and method of testing of the pipeline? viii) Is there written procedure for tackling leakages in pipeline?	Chlorine Over Ground Yes yes yes YES YES regularly Not openly Yes Yes As per OEM recommendations. Yes.
C-20.2 Handling of Hazardous Substances	
a) What are the hazardous substance handled in the factory?	POL's and LPG etc for importing and transporting through pipe lines.
b) Whether quantity of hazardous substances is above the threshold limit specified in the Manufacture, Storage and Handling of Hazardous Substances Rule, 1989? If yes, then required documentation isavailable as per the rule.	NO
c) Whether written procedure for handling the hazardous substance is available and operators are trained for handling such substances including actions required in case of leakages and spillages?	YES

d) Are the employees aware of the hazards arising from hazardous substances and safety precautions to be taken during handling of these?	YES
C-20.3 Material Safety Data Sheets (MSDS)	
a) Are the material safety data sheets available for all the chemicals handled, used and manufactured in the factory?	YES
b) Whether the latest MSDS are displayed at strategiclocations?	YES
c) Is it available in local language?	YES
C-20.4 Spill Control Measures	
a) Whether spill control procedure is available?	YES
b) Whether spill collection pit / sump is available at the workplace?	YES
c) Whether methodology for recovery / disposal of collected material has been established?	YES
C-20.5 Storage of Hazardous Substances	
a) Whether storage vessels are identified with thecapacity as required under MSIHC, Rules 1989	YES
b) What are the storage pressure and temperature?	No substances handled under pressure
c) Whether vessels are above ground / underground?	No storage of Hazardous substances in the port.
d) If any of the tanks storing flammable material, whether electrical equipment and fittings are as per electrical area classification?	Yes
e) Is the bunded area takes into account the total quantity of the largest tank?	YES
f) Whether the bund perimeter takes into consideration of trajectory of leak from tank?	YES
g) Are the vessels properly bonded and earthed and whether periodically checked and record maintained?	YES
h) Are the vessels fitted with remotely controlled isolation valves?	YES
i) Are vessels provided with emergency vent, relief valve, bursting disc, level indicator, pressure gauge, overflow line?	No storage vessels in the port.
j) Where do such vents discharge?	NA
k) Are the vessels provided with alarms for high level, high temperature and high pressure?	NA
l) Are standby empty tanks or any other alternate systems provided for emptying / transfer in case of emergencies?	NA
m) What are the provisions made for firefighting / tackling emergency situations around the storage vessels?	No storage vessels in the port. Fixed fire fighting monitors are available within the port
n) Has any consequence analysis for loss of containment been carried out?	YES

o) Whether the vessels are tested as per statute?	No storage vessels in the port
p) Whether log sheets are filled up on daily basis for recording the parameters of these vessels?	NA
q) Whether monitors for detection of leakage of flammable / toxic material installed?	Gas detect system and Smoke detector are provided
r) Whether the chemicals stored are as per their compatibility?	No chemicals are stored in the port
C-20.6 Gas Cylinders	
a) What are the various gas cylinders used in the plant?	Oxygen cylinder, DA gas cylinder are used For carrying out repairing works.
b) Are valid licenses available for storing all these cylinders?	YES
c) Are the cylinders stored and segregated as per their compatibility?	YES
d) What are the measures taken for combating any emergency in the cylinders storage area?	Gas detect system is available. On line air breathing system, Self-contained Breathing apparatus are available.
e) Whether integrity test certificates are obtained from the suppliers of the cylinders?	YES
f) Are the cylinders chained and secured properly along with the valve caps and proper identification colour code?	YES
g) Are the cylinders protected from heat or sun and rain?	YES
h) Whether monitors for detection of leakage of flammable / toxic gas installed?	YES
C-20.7 Labeling and Colour Coding	
a) Are all the containers, vessels and storage tanks labeled for its content and capacity?	YES
b) Whether the pipelines are colour coded as per IS 2379?	YES
c) Is any plant specific colour code followed?	YES
d) Whether the colour codes are displayed conspicuously in the working areas?	YES
C-20.8 Hazardous Waste Management	
a) Is identification done for various types of hazardous wastes?	YES
b) Are these quantities less than those specified by the Hazardous Wastes (Management & Handling)Rules, 1989?	YES
c) What are their disposal modes?	Disposed to State PCB Authorized vendor
d) What are the systems / measures adopted for controlling air / water / land pollution?	Air- Ambient Monitoring System. Water- ETP, STP monitoring system Land-Plantation and to reduce dust, water sprinkler system available
e) Whether the solid waste like combustibles, plastic, metals etc. segregated?	YES
C-21. FIRE AND EXPLOSION HAZARD	
C-21.1 Organisational Set-up for Fire Fighting	**THIS SECTION IS TO BE FILLED BY**

	FIRE OFFICER OR Dy. Conservator
a) What is the total strength of fire station and fire crew?	5 fire stations and fire crew 81
b) How many fire crews are available in each shift?	Approximately 15 members.
c) Is there fire squad identified in each shift?	YES
d) Standing fire order is available with latest revision	YES
e) How is the communication with fire station?	Mobile and land phone , VHF sets available
f) Does fire safety inspections carried out?	YES
g) Does emergency procedure available for leakage or combustion of flammables?	YES
h) What measures are available to control the fire load in the plant area?	We have carried out risk assessment and Load calculation. Fire extinguisher, fire hydrant, water monitor and sprinkler system, Nitrogen purging system are available at the work spots.
i) Whether technical knowledge and skills of the manager and staff responsible for overall fire safety of the plant is adequate?	YES
j) How many major and minor incidents / fires were there in the factory during the last five years? Give department / plant wise.	19 major and minor incidents
k) Have all the fires / incidents been investigated and corrective actions taken? Give break-up.	YES
l) Resources:	
1) Adequacy of protective clothing (coat, trouser, gloves, boots and helmets);	1.YES
2) Availability of SCBA for firefighting operations and spare cylinders (at least 2 for each SCBA);	2.YES
3) Adequacy of hose, nozzles, ladders, lighting equipment and pumps; and	3.YES
4) Communication facility at fire station, walkie talkie sets during firefighting.	4.YES
C-21.2 Built in Safety in Civil Design and Construction	
a) Whether the two safe means of escape available? Are they in separate directions?	YES
b) Is emergency exits provided to the building handling flammables?	YES
c) Whether emergency lights are provided?	YES
d) Whether fire / smoke detectors are installed in fire prone areas?	YES
e) Whether fire call points are provided in different areas?	YES
f) Whether Fire hydrants are provided near the buildings?	YES
g) Is ventilation system in plant handling flammables is	YES

adequate to prevent formation of flammable mixtures?	
h) Is adequate separation is provided between combustible / flammable materials and other material to restrict the fire growth?	YES
i) Access routes for fire fighting operations is available for areas having high fire load	YES
j) Whether building changes interferes with fire detection and / or fire suppression systems?	Yes
k) Whether building changes cause unreasonable fire loading / openings in the fire rated walls?	No
C-21.3 Built in Safety in Electric Circuits and Equipment	
a) Are the electrical equipment in areas where flammables mixture is likely to be present of flame-proof type?	YES
b) Are lightning arrestors are provided to the buildings / structures storing flammable materials?	YES
c) Whether adequate bonding and grounding of electrical equipment / pipelines provided?	YES
C-21.4 Explosive Substances	
a) Whether necessary license / approval taken from concerned statutory bodies?	YES
b) Whether systems for explosion suppression, high speed fire detection with deluge, sprinklers, explosion venting etc. are provided?	YES
c) Whether explosion resistant walls or barricades are provided around explosive storage?	YES
d) Whether explosive substance storage areas are restricted for entry?	YES
e) Whether only trained persons are handling explosive substances?	YES
f) Whether explosive substances are stored and transported in approved containers only?	YES
g) Whether electrical fixtures in areas handling explosives are explosion proof type?	YES
h) Whether adequate measures are taken to prevent any sources of ignition where explosive substancesare handled?	YES
C-21.5 Fire Safety in Handling Flammable and Explosive materials	
a) Whether emergency procedure is available for control of leakage?	YES
b) Whether emergency measures are displayed locally in case of accidental spillage / leakage?	YES
c) Whether facility is provided for safe drainage of combustible or flammable liquids in case of leakages?	YES

d) Whether highly flammable liquids are stored under inert atmosphere?	YES
e) Whether flammable storage tanks are provided with flame arrestors?	YES
f) Whether suitable PPEs are provided?	YES
C-21.6 Fire Detection and Alarm System	
a) What type of fire detection and alarm systemprovided?	Smoke, Heat and gas detectors are provided
b) Whether all fire prone areas of the plant are covered with fire detection system?	YES
c) Whether fire detection equipment and smoke alarms in good operating condition?	YES
d) Whether the number of fire call points are adequate and free from obstruction?	YES
e) Whether regular inspection / maintenance / testing of fire detection and alarm system carried out and records maintained	YES
f) Whether any atmospheric monitoring is carried out for explosive mixture of gases or vapours?	YES
g) Whether emergency power supplies are provided to fire detection and fire alarm system?	YES
h) Whether smoke detectors are located considering ventilation pattern?	YES
i) Whether annunciation of fire is local or in the control room or in both places?	In both places.
j) Whether fire panel is constantly attended?	YES
C-21.7 Passive and Active Fire Protection System	
a) What are the passive fire protection measures available? (barriers, doors, dampers etc.)	YES
b) Are the areas requiring fire barriers identified?	YES
c) Whether the fire barrier provided is of adequate ratings?	YES
d) Whether ventilation ducts in flammable areas have been provided with isolation dampers of suitable fire rating?	N/A
e) Whether sprinklers / deluge are installed wherever necessary?	YES
f)Whether regular inspection / maintenance / testing of fire protection system carried out and records maintained?	YES
C-21.8 Fixed Fire Extinguishing System	
a) What are the sources of firewater and whether they are dedicated to the fire extinguishing system?	We have abundant water resources for Fire Hydrant system

b) Whether the capacity of dedicated water reservoir is adequate to supply to hydrants for minimum2 h?	Yes sea water
c) Whether un-interrupted power supply is provided to the firewater pumps?	YES
d) Whether the extinguishing medium selected is appropriate to the class of fire (water, gaseous, foam, dry powder)?	YES
e) Whether fire hydrants layout is available?	YES
f) Whether additional (over minimum requirement) fire hoses, nozzles are available?	YES
g) Whether the hydrants lines are kept pressurized?	YES
h) Whether regular inspection / maintenance / testing of fixed fire extinguishing systems carried out and records maintained?	YES
C-21.9 Portable Fire Extinguishing System	
a) Whether suitable type and numbers of fire extinguishers provided?	YES
b) Whether the fire extinguishers are located at conspicuous position and easily accessible? Are they fully charged and tagged?	YES
c) Whether fire extinguishers periodically inspected, tested, refilled and records maintained?	YES
d) Whether defective / unchecked fire extinguishers present at site?	NO
e) Whether additional fire extinguishers are available?	YES
C-21.10 Fire Fighting Equipment and Facilities	
a) Whether fire tenders (water / foam) are available?	YES
b) Whether the fire-fighting system and equipment approved, tested and maintained as per relevant standard?	YES
c) Whether the SCBA / fire suit provided to firefighting team for immediate action?	YES
d) What is system for maintenance / recharge ofSCBA?	Compresers are availebul for refilling for SCBA
e) Is proper access available for firefightingequipment?	YES
f) Whether fire hose cabinets are in good condition,easily visible, and accessible?	YES
g) Whether drill tower is available? Are fire personnel carrying out regular fire drill?	YES
h) What is the communication facility at fire station?Is it adequate?	YES
C-21.11 Fire Drill	
a) Whether mock fire drills are conducted? What is the frequency of drills?	YES Once in a month

b) Whether fire drills are also performed in night shift	YES
c) Whether feedback of fire drill is documented?	YES
d) What is the system of mutual-aid scheme?	Established
C-21.12 Fire Fighting Training	
a) Whether there is a system of providing fire- fighting training to plant personnel?	YES
b) What is the frequency and duration of such training? Whether training records are maintained?	Ones in every SIX months and records maintained
c) Whether fire squads are identified for different areas for first-aid fire fighting and rescue, and suitably trained?	YES
d) Are all personnel conversant with the fire prevention and protection measures?	YES
e) Whether the fire staff are sent for refresher / advanced training courses?	YES
C-21.13 Static Electricity and Lightning	
a) Whether all vessels and pipes are provided with suitable bonding and grounding?	We have no cargo storage vessels in the port.
b) Whether arrangement has been made for grounding the tanker containing flammable liquidduring loading / unloading?	NA
c) Whether spark resistant tools are provided?	YES
d) Whether lightning protection is provided and is adequate?	YES
e) Whether antistatic clothing, hand gloves and footwear are provided?	YES
C-21.14 Pressure Relief System	
a) Whether the listing of all 'pressure plants' [as defined under Factories Act] has been done?	YES
C-22. INDUSTRIAL HYGIENE / OCCUPA-TIONAL HEALTH	
C-22.1 Ventilation, Illumination, Noise, Vibration,Heat stress and Non-ionizing Radiations	
C-22.1.1 Ventilation	
a) Whether any ventilation study has been carriedout?	Yes
b) Whether natural ventilation is adequate or not?	Natural ventilation is adequate.
c) Whether dust / fumes / hot air is generated in theprocess?	NO
d) Is periodic / preventive maintenance of ventilation system carried out and record is maintained?	NO
e) Does any ventilation system re-circulate the exhausted air in work areas?	NO
f) Is there any exhaust ventilation system in any section of the plant?	NO
g) Is the work environment assessed and monitored for chemical and physical hazards?	YES
h) Whether PPE are provided to workers exposed todust / fumes and gases?	YES

C-22.1.2 Illumination	
a) Whether illumination study has been carried out for the assessment of illumination level?	YES
b) Is there any system of periodical cleaning and replacing the light fittings / lamps in order to ensure that they give the intended illumination levels?	YES
c) Are the workers subject to periodic optometrytests and records maintained?	YES
d) Are emergency lighting available at first aid center.	YES
C-22.1.3 Noise	
a) Whether any noise study conducted?	YES
b) Are there any machines / processes generating high-noise?	YES
c) Whether engineering and administrative controls been implemented to reduce noise exposure below the permissible limits?	YES
d) Is there a system of subjecting all those employees to periodic audiometric test who work in high- level noise areas?	YES
e) Whether the workers are made aware of the ill effects of high noise?	YES
f) Whether ear muffs / plugs are provided and used?	YES
C-22.1.4 Vibration	
a) Are there equipment which contribute excess level of vibrations and whether they are identified?	N/A
b) Whether any vibration study has been carried out?	N/A
c) Are the measures taken to combat vibration to acceptable levels?	N/A
d) What is the frequency for measurements of vibration?	N/A
e) Are the records of measurements and maintenance of equipment / system maintained?	N/A
C-22.1.5 Heat Stress / Cold stress (Extremes of Temperature)	
a) Are there sources from equipment increasing the heat load in work places?	No
b) Whether evaluation of heat stress is carried out?	YES
c) Whether natural ventilation is adequate to minimize the heat stress in work environment?	YES
d) Are resources available to deal with very hot or very cold conditions (drinking water, lined gloves,insulated boots)?	YES
e) Do workers know the symptoms of heat cramps / heat stroke or frost bite / hypothermia?	YES
f) Are the personal protective equipment suitable for reducing the effects of heat stress available?	YES

C-22.1.6 Non-ionising Radiations	
a) Does the work involve likely exposure to non-ionising radiations (ultraviolet, infrared, radiofrequency, microwaves, lasers, etc.)	NA
b) Whether risk assessment have been done for all work areas involving presence of non-ionisingradiations?	NA
c) Are the work areas displayed with relevant safetysigns?	NA
d) Are the employees aware about the hazards of non-ionising radiations?	NA
e) Does written procedures exists for working in non-ionising radiations?	NA
f) Is the work environment monitored periodically for physical hazards and control measures initiated whenever deviation from permissible values isobserved?	NA
g) Whether suitable personal protective equipment are provided to workers exposed to non-ionising radiations?	NA
C-22.2 Work Place Monitoring for Hazardous Chemicals	
a) Whether the dust, fumes, smoke aerosols and mist are monitored as per statute and records maintained?	YES
b) What are the types of detectors used for monitoring concentration of hazardous chemicals?	Ambient monitoring system is available LPG detectors available.
c) Is any alarm system installed for any leakage of hazardous chemicals?	YES
d) Are antidotes available for toxic chemicals?	YES
e) Are control measures initiated whenever deviation from permissible values is observed?	YES
C-22.3 First Aid Facilities and Occupational Health Centre (OHC)	
a) Are adequate numbers of first aid boxes provided? Give location details?	YES
b) Are qualified / trained first aiders available in eachshift?	YES
c) How many qualified / trained first aiders areavailable at each plant / department?	12 trained first aiders areavailable . Electrical Dept. Officers given St.John Ambulance First Aid Trainning.
d) How many persons are trained / given refreshers training in first aid in a year?	30
e) Whether occupational health center is provided?	YES
f) Does OHC conform to the provisions of the existing statutes?	YES
g) Are the Medical Attendants / Doctors available in each shift?	YES
h) What facilities are available for transportation of the injured to hospital?	YES
i) Are the names of the trained first aiders displayed?	YES
j) Are the name of nearest hospitals and its telephone	YES

number available in OHC?	
k) Does the plant have any special preventive medicine program?	YES
l) Is ambulance posted in proper place and is it available whenever required?	YES
m)Are sufficient numbers of anti-dotes available in case of any emergency?	YES
n) Are fire safety measures provided in first aid centre?	YES
o) Are emergency lighting arrangements available at first aid centre?	YES
C-22.4 Periodic Medical Examination	
a) Are the records of all such examination maintained?	YES
b) Whether it is ensured that contractors employee are medically examined during pre-employment as well as during the course of employment?	YES
c) During the periodical medical examination of the workers, are they examined as per the hazardous process in which they work? (First schedule of The Factories Act, 1948	YES
d) Whether the periodical medical examination of employees, required under relevant statute is carried out?	YES
C-22.5 Personal Protective Equipment and Emergency Equipment	
a) Whether list of required PPE for each hazardous activity is available?	YES
b) Whether feedback from workers obtained during selection of PPE?	YES
c) Have the workers been trained in proper use of PPE including BA sets?	YES(Regular training conducted for proper use of PPEs
d) What is the system of procurement, inspection,issue, maintenance and replacement of PPE?	PPEs procured asper requirement of department and inspection carried out in every month and damaged or expiry PPEs replaced immediately
e) Whether qualitative and quantitative fit-check for respirators is ensured prior to use?	YES
f) What are the arrangements for safe custody and storage of PPE?	PPEs are issued store department asper recommendation of safety department by each department name and department issued PPEs for each individual name and maintained register
g) Are the contractor's workers provided with the required PPE?	YES
h) Do the PPE conform to any standard?	YES
i) Are sufficient eye wash fountains and safety showers available?	YES

j) Whether appropriate respiratory protective devices are available in accordance to the hazard potential?	YES
k) Are the staff members trained in the right uses of respiratory protective devices?	YES
C-22.6 Occupational Diseases	
a) Whether pre-employment medical checkup data available?	YES
b) During the medical checkup, is any person found having occupational diseases mentioned in 3rd schedule of The Factories Act, 1948?	NO
c) Whether the medical practitioner informed theChief Inspector of Factories about the occurrenceof the occupational disease?	NO
C-23. ACCIDENT / INCIDENT REPORTING,INVESTIGATION AND ANALYSIS	
C-23.1 Accident Reporting and Database Management	
a) What is the procedure for accident / incident / dangerous occurrence reporting?	Reporting system to statutory authority on a prescribed statutory formats.
b) Whether the accident data for the last five years for reportable and non-reportable accidents are available?	YES
C-23.2 Accident Investigation	
a) Are all the accidents investigated?	YES
b) Whether accident investigation procedure isdocumented?	YES
c) Whether accident investigation reports aresubmitted to top management?	YES
d) How are the findings from accident investigation reports communicated to workers?	It is communicated to the concerned wor sections / also each department communicated to their workers at morning meeting
C-23.3 Analysis of Accidents	
a) Whether accident analysis is done as per IS 3786?	YES
b) Whether root causes of accidents are analysed?	YES
c) Is the accident statistics effectively utilized? Ifyes, how?	To minimize the accident by implementing action plan
d) What nature of injuries occurred during the last five years?	YEAR FATEL NONFATEL 2017 NIL 03 2018 NIL 02 2019 NIL 02 2020 02 01 2021 NIL 03
C-23.4 Implementation of Recommendations	
a) How does the management ensure implementation of the recommendations to avoid recurrence of accidents and incidents?	CAPA implementation
C-23.5 Reporting and Investigation of Near-miss Incidents	
a) Are all near-miss incidents reported andinvestigated?	YES
b) Is there any system of classifying and analyzing the near-miss incidents?	YES

C-24. EMERGENCY PREPAREDNESS	
C-24.1 Site Specific Details	
a) Are the site area maps (including layout, access roads and assembly points) available in control room / emergency control centre?	YES
C-24.2 Duties and Responsibilities of Key Personnel	
a) Is the hierarchy of emergency response personnel right from site emergency controller downward, and alternative officials identified?	YES
b) Are the duties and responsibilities assigned to the designated officials during emergency, both during and outside normal working hours clearly identified and understood by them?	YES
C-24.3 Identification of Emergencies and Accident Scenario	
a) Are the possible accident scenarios leading to emergency identified and known to the operating personnel?	YES
b) Are approved emergency preparedness plans (on-site and off-site) in place?	YES
C-24.4 Declaration and Termination of Emergency	
a) Is the list of designated officials who are to be communicated about declaration and termination of emergency available in the control room / emergency control centre?	YES
b) Are the methods of communication (siren, public address system etc.) for declaration and termination of an emergency known to all theworkers?	YES
C-24.5 Resources-evacuation / Transport	
a) Are the following resources (equipment, personnel and procedures) required to handle emergencyavailable? 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, 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, and 9) Security / maintenance of law and order.	YES

C-24.6 Communication Facilities	
a) Does the emergency control centre have direct communication links with the fire station and the plant control room?	YES
b) Are there adequate alarm points from which an emergency alarm can be raised?	YES
c) Is there infrastructure available for ensuring backup electric power supply for communication links where required	YES
C-24.7 Medical Care	
a) Is the procedure for emergency medical care available?	YES
b) Whether the system has been tested at regular frequency through mock drill / exercises for its adequacy?	YES
c) Does the system of periodic replacement of antidotes and medicines required in emergency exist?	YES
C-24.8 Updation of Emergency Plan	
a) Is the emergency plan updated based on the feedback from the periodic drills / exercises?	YES
b) Are the contact details of all concerned officials kept updated in the emergency plan?	YES
C-24.9 Periodic Drills / Exercises	
a) Are mock-exercises conducted at stipulated intervals?	YES
b) Are the scenarios varied in the mock-exercises to ensure that all possible factors including meteorological conditions, affected plant personnel covered?	YES
c) Whether emergency preparedness Plans have been tested and reviewed at regular frequency through mock drill for its adequacy	YES
C-24.10 Training of Plant Personnel	
a) Are the plant personnel trained in handling emergency equipment?	YES
C-24.11 Public Awareness Programmes	
a) Are public awareness programs conducted for the people around the site regarding the actions to be taken in case of off-site emergency?	YES
C-24.12 Mutual-aid Programme	
a) Are the types of accidents where external organizations would be involved in remedial actions identified? Are their responsibilities defined?	YES
b) Is the plant responsible for rendering mutual aid assistance to any other external organizations? Does this assistance effect the plant's emergency preparedness?	YES
c) Whether the communication channels for mutual	YES

assistance identified and known with and betweentwo organizations?	
C-24.13 Emergency Control Centre	
a) Is the emergency control center located beyond the effective distances of identified emergencyscenarios?	YES
b) If the emergency control center is located within the effect distance, is it suitably protected that it will be available in case of emergency?	YES
C-25. SAFETY INSPECTION	
C-25.1 Inspection Programme	
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; i) Civil structure; j) House keeping; k) Emergency equipment; and l) Gas cylinder and other pressure vessels used / available in the organization.	YES
C-25.2 Safety Related Deficiency (SRD) Report	
a) Are SRDs generated based on the area wise checklists?	In place of SRD VPA is implementing checklist for specific work
b) What is the procedure for resolving the SRDs?	**Deficiencies are resolved by the concerned section officers.**
c) Whether the procedure exists for notification and root cause analysis of non-conformities and actiontaken on them?	YES
C-25.3 Safety Inspection Records	
a) Are the safety inspection records maintained?	YES
C-25.4 Methodology and Inspection Team	
a) Is there written procedure for safety inspection?	YES
b) Whether safety inspection is carried out by a designated team?	YES
c) What is the frequency of safety inspections?	Daily

d) Whether an inspection report is generated?	Yes
C-25.5 Compliance of Recommendations	
a) To whom the recommendations are submitted	Top management and to the concerned depts for copliance.
b) Are recommendations of safety inspections complied in time?	YES
c) Is compliance of recommendations sent to top management?	YES
d) Is compliance of recommendations reviewed by safety committee?	YES
e) Does top management follows-up the compliance?	YES

Place: VISAKHAPATNAM

Date: 27-9-2022

Seal:

Signature: P. Gh

Name: P. Ghani

Designation: Manager Safety

SAFETY OFFICE
PORT TRUST
VISAKHAPATNAM

ANNEXURE – II

Receipt handling and transport of Ammonium Nitrate at Port Premises

Sl. No.	Subject	Yes	No
1.	Whether the charter / stevedore/agency are a licensed Authority in handling Ammonium Nitrate ? (as per Ammonium Nitrate Rules 2011)	Importers have licensed Authority (P-4 and P-5)	
2.	Is the site notified by the Central Government to handle Ammonium Nitrate? (as per Ammonium Nitrate 'Rules 2011)	Yes	
3.	Will there be labeled bags containing Ammonium Nitrate	Yes	
4.	Is the work force skilled, educated and trained in handling Ammonium Nitrate ?	Yes	
5.	Have the Hazard and risk been communicated to the handlers?	Yes.	
6.	Has the supply of adequate number of PPE's been ensured	Yes	
7.	Is the building or floor of loading AN, constructed from combustible material ? Ex: wood, tarmac		No
8.	Is floors having large cracks or holes		No
9.	Are there any open or uncovered drains or channels in the floor? (i.e could molten AN into an under ground drain/ pipe)		No
10.	Are there adequate firefighting provisions at the work site	Yes	
11.	Is there any dedicated place for handling of Ammonium Nitrate	Yes	
12	Is the place used for the handling of AN have any chances inter mixing with incompatible substances listed below. Urea / flammable liquids/chlorates / oil / grease / gas cylinders/ acids / Zinc / or copper including the salts/ nitrites/ powdered metals/ sulphur/ alkalis/ reducing agents/ organic (carbonaceous) materials		No

13.	Is the place used for loading / Unloading, used for mixed storage or combustible materials ?		No
14.	Is there any spill prevention program at port premises ?	Yes	
15.	Are there is any chances of organic contamination of A.N At handling sites ?		No
16.	Is the area has no "NO SMOKING POLICY" ?	YES	
17.	Is the area has Hot work permit Program ?	Hot work not permitted at the time of handling of Imp A/N bags	
18.	Is the transport vehicle is licensed as per Ammonium Nitrate Rules 2011 ?	**Yes**	

Place VIZAG,

Date 27-9-2022

Signature P. Gnani

Name P. GNANI.

Designation SAFETY OFFICER
PORT TRUST
VISAKHAPATNAM

Annexure II

Gazette Notification by the Ministry of Shipping under Rule 6(4)(c) of the Ammonium Nitrate Rules, 2012

रजिस्ट्री सं० डीएल-33004/99 REGD. NO. D.L.-33004/99

भारत का राजपत्र
The Gazette of India

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पोत परिवहन मंत्रालय

(पत्तन खंड)

अधिसूचना

नई दिल्ली, 16 जुलाई, 2013

का.आ. 2182(अ).—अमोनियम नाइट्रेट नियम, 2012 के नियम 6 (4) (ग) के अंतर्गत प्रदत्त शक्तियों का उपयोग करते हुए, केन्द्र सरकार, लोक हित में अमोनियम नाइट्रेट के आयात की आवश्यकता पर विचार करते हुए, एतद्द्वारा कोलकाता, विशाखापट्टणम, वी.ओ. चिदम्बरनार और चेन्नई महापत्तनों को भारत में समुद्र मार्ग से अमोनियम नाइट्रेट के आयात हेतु अधिसूचित करती है ।

[फा. सं. पीटी-11024/8/2009-पीटी]

एम. मुरुगानंदम, संयुक्त सचिव

MINISTRY OF SHIPPING

(Ports Wing)

NOTIFICATION

New Delhi, the 16th July, 2013

S.O. 2182(E).—In exercise of the powers conferred under Rule 6(4)(c) of the Ammonium Nitrate Rules 2012, the Central Government, in consideration of the necessity to import Ammonium Nitrate in public interest, hereby notifies the Major Ports of Kolkata, Visakhapatnam, V.O. Chidambaranar and Chennai for import of Ammonium Nitrate in India by sea.

[F. No. PT-11024/8/2009-PT]

N. MURUGANANDAM, Jt. Secy.

Annexure III

Undertaking submitted to the port authority for handling ammonium nitrate.

To
M/S ----------
VISAKHAPATNAM

ITRA/SHP/FYPH
Dt. 19/ 12 / 2014.

Dear Sir,

Reg:- Import Ammonium Nitrate in Bags
Ref:- Lr. No Nil - Dated 19-12-2014.

With reference to your letter as the subject vessel m. m.v --------- arrive at -------- hrs on ----- to discharge ---------- M.T of Ammonium Nitrate in bags, you are requested to comply by giving us an undertaking in the following form.

"

QUOTE

1. We hereby undertaking that, the importing of ammonium Nitrate is of Fertilizer grade only, and has been duly notified to the APPCB, Visakhapatnam.
2. An undertaking from the cargo owners and the said cargo is well within the stipulated conditions and standards as per environment Protection Act, 1986. All relevant provisions of "Manufacture, Storage and Import of Hazardous Chemical (MSIHC) Rules, 1989 framed under "Environment (Protection) Act, 1986" would be strictly be followed.
3. To take a valid Insurance Policy under PLI Act, 1991 and copy of the same will be submitted before berthing and the same is herewith enclosed.
4. The said cargo has the property of giving off oxygen when involved in fire and mixtures of these substances are readily ignited with combustible materials. Therefore, all the places / areas on the shore or warehouse will be thoroughly cleaned and dried prior to receipt of this cargo.
5. We will ensure that the wharf is fully cleaned by us and that no cargo whatsoever is left on the wharf after completion of discharge of the vessel.
6. The vehicle speed at berth will not be more than 20 kmph and the drivers will be instructed not to apply sudden brakes and also that all the vehicles and cargo moving equipment are in good condition to ensure they do not leak any mineral oils.
7. 30 meters areas on the berth to be cordoned and to ensure no unauthorized persons are permitted.
8. The drivers of the vehicles and cargo moving equipment carrying Ammonium Nitrate of Fertilizer grade will be instructed to ensure no leakage of oil/fuel from the vehicles taken place. We will not deploy such vehicles.
9. We will give requisition of stand by of fire watch from the time vessel is berthed till the vessel is unberthed along with our C&F Agent Deposit Account Number.
10. We will inform the Port Fire Officer before berthing and commencement of discharge of the cargo.
11. The consignee/owner and vessel's Agent will indemnify the Visakhapatnam Port Trust for any damage / injury to the Port's property, Personnel etc. of even any liabilities arising out or damage to third party during the time of unloading the said cargo from the vessel (Copy enclosed).
12. We will assist the Port to ensure that no unauthorized personnel are allowed in the working area.
13. We will ensure that the trucks / dumpers are loaded not beyond the brim to avoid spillages of the cargo. We will also ensure that the trucks are suitably covered through the entire journey till storage area.
14. We will ensure that all workers engaged in handling of this cargo shall wear personal protective equipments.
15. We will provide Bore well, which can yield adequate quantity of water in our Godowns where the cargo is likely to be stored to adequately meet any urgency/contingency/untoward incidents.

16. We will obtain all relevant permissions as are required by various statutes in force such as permission of the Chief Controller of Explosives etc. and shall continue to abide by all the regulations in force till the cargo is finally evacuated from the Port area and its estate.

17. A certificate of purity/analysis report issued by the competent authority in the country of manufacture will be produced before such cargo on board a vessel is allowed inside the docks (Copy enclosed).

18. Welding, burning, cutting or other operations involving the use of fire, open flame, spark or Arc producing equipment will not be carried out or used. Special precautions will be taken both on board and on shore to ensure that there is no 'No smoking' or 'Naked lights', particularly in or near the hold.

19. The said cargo will be particularly separated from other combustible materials (particularly liquids) or Organic substances such as oils and waxes, reducing agents, acids, alkalis, sulphur, chlorates, chlorites, chlorides, Hypochlorites, chromates, Nitrates, permanganates, finely divided or powered metals and substances containing metals such as the chromium, copper, cobalt, Nickel, Zinc and their alloys and fibrous materials (e.g. cotton, Jute, sizal, Saw dust etc.). The said cargo will be separated from all other goods.

20. Bunkering or pumping of fuel oil will not be allowed during the unloading operation.

21. Vessel will ensure that the ship's fire-fighting appliances on board the vessel are kept in readiness at all times to meet any emergency and fire-fighting personnel should be present along with appropriate fire-fighting appliances during the entire period of unloading the said cargo from the vessel.

22. The unloading operation of the said cargo will be carried out under direct supervision of a responsible nominee of the vessel till the completion of such operation.
The handling and delivery operations of the said cargo will be carried out under supervision of a responsible nominee of the importer till the completion of such operation.

23. We are enclosing herewith Analysis Report of Ammonium Nitrate wherein clearly marked as Fertilizer grade.

24. We will comply with the rules mentioned in the Column 3 & 4 of scheduled 2 of manufacture storage, import of hazardous chemicals (MSIHC) Rules, 1988 as amended.

25. We will comply with the rule 15 & 18 of MSIHC rules.

26. We will comply with the central Motor vehicle rules 1988 framed under the provisions of Motor Vehicle Act, 1988.

27. Strict procedure shall be followed for maintaining cleanliness at the jetty while handling Ammonium Nitrate to prevent contamination with any reactive substance
containing carbonaceous, hydro-carbonaceous material and any other incompatible material.

28. The code of practice prescribed by United Nations guidelines on transportation of hazardous substances and chemicals will be strictly followed.

29. The bagged cargo shall be directly taken delivery from hook point itself and shall not be stored either in dock area." or any other godown constructed in the land allotted by VPT and circulated vide Traffic Department Circular No.371 dt 04-02-2013 of a file ITRA/SHP/FAMN

UN QUOTE

Thanking You

Enclosed for item 2,3,11,17 and 23

Yours faithfully

TRAFFIC MANAGER

Annexure V

MATERIAL SAFETY DATA SHEET

(As provided by Port Authorities during field visit)

Safety Data Sheet
According to REACH Regulation 1907/2006/EC and Regulation (EU) 2015/830

Revision Number: A-2.2-EN	Revision Date: 28-02-2018

SECTION 1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identifier

Name: Ammonium nitrate.
Synonyms: Nitric-acid ammonium, nitric acid ammonium salt.
CAS number: 6484-52-2.
EC number: 229-347-8.
REACH registration number: 01-2119490981-27-0018.

1.2. Relevant identified uses of the substance or mixture and uses advised against

Identified uses:
Fertilizer, use in the manufacturing of formulations for adhesives and sealants, explosives, fertilizers and water treatment chemicals.

Uses advised against: No.

1.3. Details of the supplier of the safety data sheet

Manufacturer:
Uralchem, JSC
Presnenskaya Naberezhnaya 6 bldg. 2
Moscow, 123112, Russia

Azot Branch of Uralchem JSC in Berezniki
Churtanskoe Shosse 75, Berezniki,
Perm Krai, 618401 Russia
Tel.: +7 (3424) 29-82-09
E-mail: azot@uralchem.com

Only representative:
Uralchem Assist GmbH
Johannssenstrasse 10,
Hannover, 30159, Germany

5.3. Advice for firefighters
Fight fire with normal precautions from a reasonable distance. Wear a self-contained breathing apparatus and chemical resistant suit. Rubber boots (heat resistant). Rubber gloves (oil and gasoline resistant).
SECTION 6. ACCIDENTAL RELEASE MEASURES
6.1. Personal precautions, protective equipment and emergency procedures
Wear personal protection equipment. See protective measures under point 7 and 8.
6.2 Environmental precautions
Do not empty into drains or the aquatic environment. Do not allow to enter into soil/subsoil.
6.3. Methods and material for containment and cleaning up
Remove mechanically, placing in appropriate containers for disposal. Unsuitable material for absorbing: Sawdust. Combustible. Material recycling possible. Wash with generous amount of water. In case of gas being released or leakage into waters, ground or the drainage system, the appropriate authorities must be informed.
6.4. Reference to other sections
See protective measures under Section 8 and 13.
SECTION 7. HANDLING AND STORAGE
7.1. Precautions for safe handling
Provide for sufficient ventilation and punctiform suction at critical points.

Tel.: + 49 511 45 99 445
Email: info@uralchem-assist.com

E-Mail address for the competent person responsible for the safety data sheet: reach@uralchem.com

1.4. Emergency telephone number

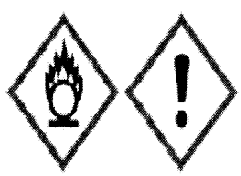
+44 (0) 203 394 9870 (24/7)

SECTION 2. HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008 on classification, labeling and packaging:
Oxidizing solid, Category 3, H272
Eye irritation, Category 2, H319

2.2. Label Elements



WARNING

Hazard Statements:
H272: May intensify fire; oxidizer.
H319: Causes serious eye irritation.

Precautionary Statements:
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P220: Keep away from clothing and other combustible materials.
P370+P378: In case of fire: Use water to extinguish.
P264: Wash hands thoroughly after handling.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

2.3. Other hazards

PBT/vPvB: The study does not need to be conducted because the substance is inorganic.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substance:
Main ingredient: Ammonium nitrate
CAS number: 6484-52-2
EC number: 229-347-8

CAS number	EC number	Name	Weight % content (or range)	Classification according to Regulation (EC) No 1272/2008	Specific concentration limit; M-Factor	REACH registration number
6484-52-2	229-347-8	Ammonium nitrate	≥ 95	Oxidising solid 3 H272 Eye Irritation 2 H319	≥ 80% — < = 100% Eye Irritation 2 H319	01-2119490981-27-0018
10377-60-3	233-826-7	Magnesium nitrate	≤ 1.9	Oxidising solid 3 H272	–	01-2119491164-38-0003

At customer's request the product is processed with anticaking additive, which is registered under REACH.

3.2. Mixture: Not applicable.

SECTION 4. FIRST AID MEASURES

4.1. Description of first aid measures

4.1.1. General information:
In case of accident or if you feel unwell, seek medical advice immediately (show safety data sheet if possible).

4.1.2. Following inhalation:
Remove casualty to fresh air and keep warm and at rest.
Rinse nasal cavities with water.

4.1.3. After skin contact:
After contact with skin, wash immediately with plenty of water
Immediately remove any contaminated clothing, shoes or stockings.

4.1.4. Following eye contact:
In case of contact with eyes, rinse immediately with plenty of flowing water for 10 to 15 minutes holding eyelids apart. Subsequently consult an ophthalmologist.

4.1.5. After ingestion:

If accidentally swallowed rinse the mouth with plenty of water (only if the person is conscious) and obtain immediate medical attention.
Do NOT induce vomiting.

4.1.6. Self-protection of the first aider.
First aid assistant: Pay attention to self-protection!

4.2 Most important symptoms and effects, both acute and delayed

Inhalation: weakness, headache, cough, shortness of breath. In hard cases: cyanosis of skin and mucous membranes, palpitation, decrease in arterial pressure, spasms, spontaneous urination and defaecation.
Swallowing: nausea, vomiting, acute abdominal pain.
Skin contact: reddening, morbidity, burning, edema.
Eye contact: reddening, lacrymation, pain.

4.3. Indication of any immediate medical attention and special treatment needed

Treat symptomatically.
First-aid measures: Eyewash, sterile bandages, cotton, activated carbon, laxative salts.

SECTION 5. FIREFIGHTING MEASURES

5.1. Extinguishing media

Suitable extinguishing media:
Water spray.

Extinguishing media which must not be used for safety reasons:
Foam.
Sand.
Water steam.

5.2. Special hazards arising from the substance or mixture

Can be released in case of fire: Nitrogen oxides (NOx), ammonia, amines.
Danger of explosion at contact with inflammable or organic substances.

5.3. Advice for firefighters
Fight fire with normal precautions from a reasonable distance. Wear a self-contained breathing apparatus and chemical resistant suit. Rubber boots (heat resistant). Rubber gloves (oil and gasoline resistant).
SECTION 6. ACCIDENTAL RELEASE MEASURES
6.1. Personal precautions, protective equipment and emergency procedures
Wear personal protection equipment. See protective measures under point 7 and 8.
6.2 Environmental precautions
Do not empty into drains or the aquatic environment. Do not allow to enter into soil/subsoil.
6.3. Methods and material for containment and cleaning up
Remove mechanically, placing in appropriate containers for disposal. Unsuitable material for absorbing: Sawdust. Combustible. Material recycling possible. Wash with generous amount of water. In case of gas being released or leakage into waters, ground or the drainage system, the appropriate authorities must be informed.
6.4. Reference to other sections
See protective measures under Section 8 and 13.
SECTION 7. HANDLING AND STORAGE
7.1. Precautions for safe handling
Provide for sufficient ventilation and punctiform suction at critical points.

DNEL/DMEL: Consumer					
Short term (acute)	Systemic effects	Skin contact	--	mg/kg bw/day	--
		Inhalation	--	mg/m³	--
		Ingestion	--	mg/kg bw/day	--
	Local effects	Skin contact	--	mg/cm²	--
		Inhalation	--	mg/m³	--
Long term (repeated)	Systemic effects	Skin contact	2.56	mg/kg bw/day	Repeated dose toxicity
		Inhalation	8.9	mg/m³	Repeated dose toxicity
		Ingestion	2.56	mg/kg	Repeated dose toxicity
	Local effects	Skin contact	--	mg/cm²	Repeated dose toxicity
		Inhalation	--	mg/m³	--
		Ingestion	--	mg/kg bw/day	--

PNEC			
Freshwater	-	mg/l	--
Marine water	-	mg/l	--
Intermittent releases	-	mg/l	--
Sediment	-	mg/kg	--
Sediment-marine	-	mg/kg	--
Soil	-	mg/kg	--
Air	-	mg/cm²	--
Sewage treatment plant	18	mg/l	Extrapolation method
Secondary poisoning	-	mg/kg	--

8.2. Exposure controls

8.2.1. Appropriate engineering controls

Provide adequate ventilation.
Provide extract ventilation to points where emissions occur.

8.2.2. Individual protection measures, such as personal protective equipment

Respiratory protection:
Use a suitable respirator or a bulky-dressing.
Hand protection:
Long sleeved overall: chemically resistant gloves conforming to EN374 with basic employee training.

Eye protection:
Suitable eye protection: Chemical goggles
Skin protection:
Wear suitable working clothes.
Woolen or cotton suits.
Leather or rubber boots.
General protection and hygiene measures:
Work under a high standard of personal hygiene.
Wash hands and face before breaks.
When using the product, do not eat, drink or smoke.

8.2.3. Environmental exposure controls

Establish monitoring systems for monitoring particulates concentration (dust).

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Appearance (physical state and colour):	Solid, granulate. White, yellow < 1 mm: < 3% 1-4 mm: >= 95% < 6 mm: 100%.
Odour:	Odourless
Odour threshold:	Not applicable (odourless)
pH:	> 5 (10% water solution)
Melting point/freezing point:	169.6 °C (1013 hPa)
Boiling point/boiling range:	Decomposes before boiling.
Flash point:	The study does not need to be conducted because the substance is inorganic.

Flammability (solid, gas):	Non-flammable.
Upper/lower flammability or explosive limits:	Not applicable (non-flammable)
Explosive properties:	Not explosive
Oxidizing properties:	Oxidizing solid. Category 3 H272: May intensify fire; oxidizer.
Vapour pressure:	Not applicable (decomposition)
Relative density:	1.72 (20°C)
Solubility:	No data available (not required by REACH)
Water solubility:	>100 g/l (20 °C)
Partition coefficient: n-octanol/water:	Not applicable (inorganic).
Viscosity:	Not applicable (solid)
Vapour density:	No data available (not required by REACH)
Evaporation rate:	No data available (not required by REACH)
Auto-ignition temperature:	No self-ignition up to the melting point.
Decomposition temperature:	>=210 °C
9.2. Other information	
Water absorbing.	

SECTION 10. STABILITY AND REACTIVITY

10.1. Reactivity

Reacts with: strong alkalis, strong acid.
Formation of: ammonia, nitrogen oxides (NOx).

10.2. Chemical stability

Not hazardous reaction when handled and stored according to provisions.

10.3. Possibility of hazardous reactions

Thermal decomposition.
Risk of explosion at interaction with combustible/organic substances.
In the closed space the fire with participation of ammonium nitrate can pass in explosion.

10.4. Conditions to avoid

Keep away from: Incompatible materials.
Atmosphere influence.
Keep away from heat sources (e.g. hot surfaces), sparks and open flames.
Welding equipment with traces of fertilizers.

10.5. Incompatible materials

Reducing agents, strong acids and bases, metal powders, combustible materials, chromates, zinc, copper and copper alloys, chlorates.

10.6. Hazardous decomposition products

Nitrogen oxides (NOx).
Ammonia.
Amines.

SECTION 11. TOXICOLOGICAL INFORMATION	
11.1. Information on toxicological effects	
11.1.1. Acute effects (acute toxicity, irritation and corrosivity)	
11.1.1.1. LD50 oral:	Ammonium nitrate: 2950 mg/kg bw (rat, male/female) OECD 401
11.1.1.2. LD50 dermal:	Ammonium nitrate: > 5000 mg/kg bw (rat, male/female) OECD 402
11.1.1.3. LC50 inhalation:	No data available.
11.1.1.4. Skin corrosion / irritation:	Ammonium nitrate: Not an irritant. (rabbit) OECD 404
11.1.1.5. Serious eye damage / irritation:	Ammonium nitrate: Irritant (rabbit) OECD 405 Eye irritation, Category 2, H319: Causes serious eye irritation.
11.1.1.6. Specific target organ toxicity – single exposure:	Based on the available data, the classification criteria are not met.
11.1.2. Sensitisation	
Ammonium nitrate: **Respiratory sensitisation:** No data available. **Skin sensitisation:** No sensitising (mouse, read-across) OECD 429, EU B.42, EPA OPPTS 870.2600	

11.1.3. Repeated dose toxicity

Ammonium nitrate:

Specific target organ toxicity — repeated exposure: Based on the available data, the classification criteria are not met.

Subacute oral toxicity:
NOAEL >= 1500 mg/kg bw/day (rat, male/female, read-across)
OECD 422

Chronic oral toxicity:
NOAEL (52, 104 weeks) = 256 mg/kg bw/day (rat, male, read-across)
NOAEL (52, 104 weeks) = 284 mg/kg bw/day (rat, female, read-across)
OECD 453 Ota Y. et al. (2006)

Subacute inhalative toxicity:
NOAEC (systemic) > 185 mg/m^3 air (rat, male)

11.1.4. CMR effects (carcinogenity, mutagenicity and toxicity for reproduction)

Ammonium nitrate:

Carcinogenicity Test not required. The substance is not genotoxic.

Germ cell mutagenicity: Based on the available data, the classification criteria are not met.

Reproductive toxicity: Based on the available data, the classification criteria are not met.
Effects on fertility:
Oral:
NOAEL ≥ 1500 mg/kg bw/day (read-across) (rat; male/female)
OECD 422

Developmental toxicity:
Oral):
NOAEL ≥ 1500 mg/kg bw/day (read-across) (rat; male/female)
OECD 422

Reproductive toxicity, effects on or via lactation: No data available.

11.1.5. Aspiration hazard

No data available.

SECTION 12. ECOLOGICAL INFORMATION	
12.1. Toxicity	
Acute toxicity to fish	
LC50:	Ammonium nitrate: Species: *Cyprinus carpio* 447 mg/l (48h) (freshwater, static) Dabrowska, H. and Sikora, H. (1986)
Chronic toxicity to fish	
NOEC:	No data available.
Acute toxicity to crustaceans	
EC50:	Ammonium nitrate: Species: *Daphnia magna* 490 mg/l (48h) (freshwater, read-across) Dowden, B. F. and Bennett H. J. (1965)
Chronic toxicity to crustaceans	
NOEC:	No data available.
Acute toxicity to algae and other aquatic plants	
EC50:	Ammonium nitrate: Species: *Several benthic diatoms* > 1700 mg/L (10 d) (marine water, inhibition of growth rate, read-across) Admiraal W. (1977)
Toxicity data on soil micro- and macro-organisms and other environmentally relevant organisms, such as birds, bees and plants	

No data available.	
12.2. Persistence and degradability	
Readily biodegradable:	The study does not need to be conducted because the substance is inorganic. Required removal efficiency (wastewater): Anaerobic conversion of ammonium: Average biodegradation (20°C): 52 g N/kg/day. Anaerobic transformation of nitrate: Average rate of biodegradation (20°C): 70 g N/kg/day.
Other relevant information:	In water, the substance is completely dissociated.
12.3. Bioaccumulative potential	
Experimental BCF:	Low bioaccumulation potential
Log Pow:	The study does not need to be conducted because the substance is inorganic.
12.4. Mobility in soil	
Low adsorption potential.	
12.5. Results of PBT and vPvB assessment	
The study does not need to be conducted because the substance is inorganic.	
12.6. Other adverse effects	
In environment transforms with the formation of nitrogen oxides and ammonia.	

SECTION 13. DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

This product and its packaging must be disposed of in a safe way. Generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional or local authority requirements.

13.1.1. Product

Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer but processed in a suitable effluent treatment plant. Depending on the degree and nature of the contamination, dispose of it as fertilizer on the field, as a raw material or in an authorized waste facility. Incineration or landfill should only be considered when recycling is not feasible. European waste catalogue (EWC) waste code 06 10 02 - wastes containing dangerous substances.

13.1.2. Packaging

Empty containers or liners may contain product residues. Packages should be emptied and can be recycled after thorough cleansing. If approved by local authorities, empty containers may be disposed of as non-hazardous material or returned for recycling.

SECTION 14. TRANSPORT INFORMATION

14.1 UN number	1942
14.2 UN proper shipping name	AMMONIUM NITRATE
14.3 Transport hazard class(es)	5.1
14.4 Packing group	III
14.5 Environmental hazards	No

14.6. Special precautions for user

Reduces oxygen content in hold.
Avoid contact of cargo with heated surfaces above 50 °C.
Humid cargo is corrosive.

14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code

Not applicable.

SECTION 15. REGULATORY INFORMATION

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Regulation (EC) No 2003/2003 of the European Parliament and of the council of 13 October 2003, relating to fertilizers.

Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy.

Council Directive 91/676/EEC concerning the Protection of Waters against Pollution caused by Nitrates from Agricultural Sources.

Directive 2012/18/EU of the European Parliament and of the council of 4 July 2012, on the control of major-accident hazards involving dangerous substances.

15.2. Chemical safety assessment

For this substance a chemical safety assessment has been carried out.

SECTION 16. OTHER INFORMATION

Indication of changes:

Version № A-2.2-EN of 28-02-2018
Section 13.1., 13.1.1, 13.1.2: Added information on Disposal considerations.
Section 15.1: Added Directive 2012/18/EU.

Abbreviations:

DNEL: Derived No-Effect Level
PNEC: Predicted No-Effect Concentration
NOAEL: No Observed Adverse Effect Level
NOEC: No observed effect concentration.
LD50: Lethal Dose 50%. The LD50 corresponds to the dose of a tested substance causing 50% lethality during a specified time interval.
LC50: Lethal Concentration 50%. The LC50 corresponds to the concentration of a tested substance causing 50% lethality during a specified time interval.
EC50: Effective Concentration 50%. The EC50 corresponds to the concentration of a tested substance causing 50% changes in response (e.g. on growth) during a specified time interval.
BCF: Bioconcentration factor
PBT: Persistent, bioaccumulative and toxic
vPvB: Very Persistent and very Biaoccumulative

Recommendations about use:

On loamy soils it is recommended to apply as the basic fertilizer in autumn and spring. On easy soils it is reasonable to apply before dropping under cultivation. Top dressing of plants by ammonium nitrate is necessary for finishing not later than middle of summer not to detain maturing of fruits and vegetables. At regular use of ammonium nitrate acidity of soil can raise. For neutralization of acidity of soil it is necessary to conduct liming.
Recommended doses:
Vegetable cultures, potato (apply before dropping or in top dressing) – 2-3kg/100м^2 and 0.5-1.0kg/100м^2 at top dressing in vegetation. Fruit and berry cultures (top dressing in vegetation) – 150-300g under one tree (bush). All cultures (top dressing in vegetation) – 100g/10L waters/10m^2

ANNEX I

Exposure scenario: Ammonium nitrate

1.- Title of exposure scenario number 1: Manufacturing	
SU 8: Manufacture of bulk, large scale chemicals (including petroleum products) *SU9: Manufacture of fine chemicals*	
ERC1: Manufacture of substances	
PROC1: Use in closed process, no likelihood of exposure *PROC2: Use in closed, continuous process with occasional controlled exposure* *PROC3: Use in closed batch process (synthesis or formulation)* *PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities* *PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities* *PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)* *PROC14: Production of preparations or articles by tabletting, compression, extrusion, pelletisation* *PROC15: Use as laboratory reagent*	
2.- Exposure scenario	
2.1.- Contributing scenario controlling environmental exposure for ERC1	
Environmental assessment: Not performed.	
2.2.- Contributing scenario controlling worker exposure for PROC1, 2, 3, 8a, 8b, 9, 14, 15.	
Product characteristics	
Concentration	No data available.
Physical state	Solid
Volatility	Low
Amounts used	
No data available	
Frequency and duration of use	
Duration	> 4 hours per day.
Human factors not influenced by risk management	
No data available	
Other given operational conditions affecting workers exposure	
Domain	Industrial.
Indoor / Outdoor	Indoor.
Technical conditions and measures at process level (source) to prevent release	
Effectiveness of containment	

Technical conditions and measures to control dispersion from source towards the worker	
Ventilation	Provide a good standard of general ventilation.
Local exhaust ventilation (LEV)	Not required.
Organisational measures to prevent/limit releases, dispersion and exposure	
Minimise number of staff exposed. Segregation of the emitting process. Effective contaminant extraction. Minimisation of manual phases. Avoidance of contact with contaminated tools and objects. Regular cleaning of equipment and work area. Management supervision in place to check that the RMMs in place are being used correctly and OCs followed. Training for staff on good practice. Good standard of personal hygiene.	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection	Not required.
Hand protection	Not required.
Eye protection	Goggles.
Skin protection	Not required.
3.- Exposure estimation and reference to its source	
Human health assessment: Qualitative assessment (eye irritation, oxidising) Environmental assessment: Not performed.	
4.- Guidance to DU to evaluate whether he works inside the boundaries set by the ES.	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling was deemed necessary to define appropriate site-specific risk management measures.	

1.- Title of exposure scenario number 2: Industrial use including distribution and other activities related to the processes in industrial settings
SU3: Industrial uses: Uses of substances as such or in preparations at industrial sites *SU10: Formulation [mixing] of preparations and/or re-packaging (excluding alloys)*
PC1: Adhesives, sealants *PC11: Explosives* *PC12: Fertilizers*

PC19: Intermediate *PC37: Water treatment chemicals*	
ERC2: Formulation of preparations (mixtures) *ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates).*	
PROC1: Use in closed process, no likelihood of exposure *PROC2: Use in closed, continuous process with occasional controlled exposure* *PROC3: Use in closed batch process (synthesis or formulation)* *PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)* *PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities* *PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities* *PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)* *PROC13: Treatment of articles by dipping and pouring* *PROC15: Use as laboratory reagent*	
2.- Exposure scenario	
2.1.- Contributing scenario controlling environmental exposure for ERC2 and 6a	
Environmental assessment: Not performed.	
2.2.- Contributing scenario controlling worker exposure for PC1, 11, 12, 19, 37, PROC1, 2, 3, 5, 8a, 8b, 9,13 and 15	
Product characteristics	
Concentration	100%
Physical state	Solid, liquid.
Volatility	Low
Amounts used	
No data available.	
Frequency and duration of use	
Duration	> 4 hours/day.
Human factors not influenced by risk management	
No data available.	
Other given operational conditions affecting workers exposure	
Domain	Industrial.
Indoor / Outdoor	Indoor.
Technical conditions and measures at process level (source) to prevent release	
Effectiveness of containment	

Technical conditions and measures to control dispersion from source towards the worker	
Ventilation	Provide a good standard of general ventilation.
Local exhaust ventilation (LEV)	Not required.
Organisational measures to prevent/ limit releases, dispersion and exposure	
Minimise number of staff exposed. Segregation of the emitting process. Effective contaminant extraction. Minimisation of manual phases. Avoidance of contact with contaminated tools and objects. Regular cleaning of equipment and work area. Management/supervision in place to check that the RMMs in place are being used correctly and OCs followed. Training for staff on good practice. Good standard of personal hygiene.	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection	Not required.
Hand protection	Not required.
Eye protection	Goggles.
Skin protection	Not required.
3.- Exposure estimation and reference to its source	
Human health assessment: Qualitative assessment (eye irritation, oxidising) Environmental assessment: Not performed.	
4.- Guidance to DU to evaluate whether he works inside the boundaries set by the ES.	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling was deemed necessary to define appropriate site-specific risk management measures.	

1.- Title of exposure scenario number 3: Professional end use
SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
PC12: Fertilizers
ERC8b: Wide dispersive indoor use of reactive substances in open systems *ERC8e: Wide dispersive outdoor use of reactive substances in open systems*
PROC1: Use in closed process, no likelihood of exposure *PROC2: Use in closed, continuous process with occasional controlled exposure*

PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities *PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities* *PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)* *PROC11: Non industrial spraying* *PROC15: Use as laboratory reagent* *PROC19: Hand-mixing with intimate contact and only PPE available*	
2.- Exposure scenario	
2.1.- Contributing scenario controlling environmental exposure for ERC8b and 8e	
Environmental assessment: Not performed.	
2.2.- Contributing scenario controlling worker exposure for PC12, PROC 1, 2, 8a, 8b, 9, 11, 15 and 19	
Product characteristics	
Concentration	≤ 25%
Physical state	Solid, liquid.
Volatility	Low.
Amounts used	
No data available.	
Frequency and duration of use	
Duration	≤ 4 hours per day
Human factors not influenced by risk management	
No data available.	
Other given operational conditions affecting workers exposure	
Domain	Professional.
Indoor / Outdoor	Indoor / Outdoor.
Technical conditions and measures at process level (source) to prevent release	
Technical conditions and measures to control dispersion from source towards the worker	
Ventilation	Provide a good standard of general ventilation.
Local exhaust ventilation (LEV)	Not required.
Organisational measures to prevent/limit releases, dispersion and exposure	
Minimize number of staff exposed. Segregation of the emitting process. Effective contaminant extraction. Minimisation of manual phases. Avoidance of contact with contaminated tools and objects.	

Regular cleaning of equipment and work area. Management supervision in place to check that the RMMs in place are being used correctly and OCs followed. Training for staff on good practice. Good standard of personal hygiene.	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection	Not required.
Hand protection	Not required.
Eye protection	Goggles.
Skin protection	Not required.
3.- Exposure estimation and reference to its source	
Human health assessment: Qualitative assessment (eye irritation, oxidising) Environmental assessment: Not performed.	
4.- Guidance to DU to evaluate whether he works inside the boundaries set by the ES.	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented [G22]. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels [G23]. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling was deemed necessary to define appropriate site-specific risk management measures [DSU1].	

1.- Title of exposure scenario number 4: Consumer end use
SU21: Consumer uses: Private households (= general public = consumers)
PC11: Explosives *PC12: Lawn and garden preparations*
ERC8b: Wide dispersive indoor use of reactive substances in open systems *ERC8e: Wide dispersive outdoor use of reactive substances in open systems* *ERC10a: Wide dispersive outdoor use of long-life articles and materials with low release*
2.- Exposure scenario
2.1.- Contributing scenario controlling environmental exposure for ERC 8b, 8e and 10a
Environmental assessment: Not performed.
2.2.- Contributing scenario controlling consumer exposure for PC 11 and 12
Product characteristics
No data available.
Amounts used
No data available.

Frequency and duration of use	
No data available.	
Human factors not influenced by risk management	
No data available.	
Other given operational conditions affecting consumers exposure	
No data available.	
Conditions and measures related to information and behavioural advice to consumers	
Product labelling.	
Conditions and measures related to personal protection and hygiene	
Respiratory protection	Not required.
Hand protection	Not required.
Eye protection	Chemical goggles.
Skin protection	Not required.
3.- Exposure estimation and reference to its source	
Human health assessment: Qualitative assessment (eye irritation, oxidising) Environmental assessment: Not performed.	
4.- Guidance to DU to evaluate whether he works inside the boundaries set by the ES.	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented [G22]. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels [G23]. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling was deemed necessary to define appropriate site-specific risk management measures [DSU1].	