BEFORE THE NATIONAL GREEN TRIBUNAL, SOUTHERN REGION- CHENNAI.
(Application u/s 14,15 read with sections 17,18 of the NGT Act 2010)

O.A.NO. 253 OF 2024

IN THE MATTER OF:

Sri Chaitanya Sravanthi — Applicant

Vs

State of Andhra Pradesh & 9 Others — Respondents

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BEFORE THE NATIONAL GREEN TRIBUNAL, SOUTHERN REGION- CHENNAI.

O.A.NO.253 OF 2024.

IN THE MATTER OF:

Sri Chaitanya Sravanthi . Applicant

Vs

State of Andhra Pradesh &9 Others Respondents.

COUNTER AFFIDAVIT IN REPLY ON BEHALF OF ANSWERING RESPONDENT No.9, VISAKHAPATNAM PORT LIMITED.

I,S. Balamurali, S/oK. Selvaraj, Hindu, aged about 32 years having office at 3rd Floor, Administrative Office Building, Visakhapatnam Port Authority do hereby solemnly affirm and state as follows;

I am the Visakhapatnam Port Authority of the 9thRespondent/ Port and very well acquainted with the facts and circumstances of this case.

1) I deny all the allegations contained in the Application and the Applicant is strict to proof of the same.

2) I submit that Without Prejudice to the above contentions, the 9thRespondent submits the following facts of this case.

3) The 9thRespondent submits that the Visakhapatnam Port Authority, located on the eastern coast of India in Andhra Pradesh, is one of the country's most significant and oldest ports. Established in 1933, it was developed during the British era to cater to the growing maritime trade in the Bay of Bengal region. Over the decades, it has evolved into a major commercial hub, equipped with modern infrastructure to handle bulk cargo, containers, and liquid cargo. The port plays a vital role in India's shipping sector, acting as a gateway for trade to Southeast Asia, East Asia, and beyond. It serves as a crucial node for the export of iron ore, coal, fertilizers, and other goods while supporting imports like crude oil, machinery, and consumer products. Its strategic location and deep-water harbour make it essential for both domestic and international shipping, contributing significantly to India's economy by facilitating global trade, boosting regional development, and generating employment.

4) The 9th Respondent submits that Visakhapatnam Port Authority receive Ammonium Nitrate (AN) with Fertilizer Grade by ships. Ammonium Nitrate is unloaded on wharf and then transported to destination by the users. Generally,1.2 tons of Ammonium Nitrate in baggage form is unloaded of EQ-3 and EQ6 wharf and 12-15 bags are packaged in a container at a time. The Transportation by road will be closed container or open truck and passing by the port limit to the consignee.

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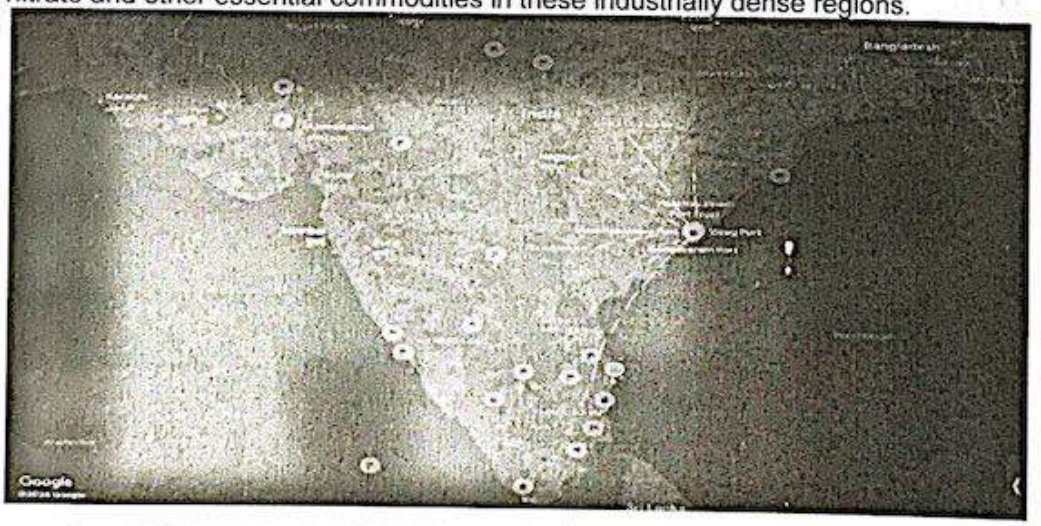
5) The 9th Respondent submits that it has responsibility to take care of the surrounding environment to protect without interference or effects by the cargo handling. In this process VPA follows the conditions and guidelines which are given by the Ministry, National Green Tribunal (NGT) as well as Central and State Pollution Control Boards. In this regard, the Green Tech for Environmental Protection Winner award was given to the 9th Respondent in the year 2021 among the Port Sector. The Certificate for winner award for 2021 is annexed as **Annexure-1**

6) The 9th Respondent submits that Visakhapatnam Port is uniquely positioned, surrounded by a thriving industrial belt on three sides, making it a crucial hub for economic and industrial activities.

To the **North,** the region is dominated by industries in the states of **Odisha** and **Chhattisgarh**, which host a significant concentration of **mining, steel, and power** production facilities. This area relies heavily on ammonium nitrate for blasting operations in mining and other industrial processes.

To the **West**, **Telangana and central Andhra Pradesh** form another industrial belt focused on **cement manufacturing, pharmaceuticals, and agriculture,** all of which benefit from the steady supply of ammonium nitrate and other raw materials through the port.

To the **South**, southern **Andhra Pradesh and Tamil Nadu** are home to industries like **textiles, petrochemicals, and fertilizer** production, further emphasizing the port's strategic importance. The proximity of Visakhapatnam Port to these industrial belts ensures efficient transportation and distribution of goods, thanks to its robust rail and road connectivity. This logistical advantage minimizes costs and ensures timely delivery, making the port a vital gateway for the supply chain of ammonium nitrate and other essential commodities in these industrially dense regions.



7) **The 9th Respondent, giving the following facts of the case related to the ammonium nitrate import, before going to the allegations of the applicant as follows:**

The 9th Respondent submits that the Visakhapatnam Port Authority has a notable **history of handling ammonium nitrate**, for the last 20 years, a key chemical used in the manufacturing of fertilizers and explosives for the mining and infrastructure sectors. Recognizing the hazardous nature of ammonium nitrate, the port has

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implemented stringent safety protocols to ensure its safe handling, storage, and transportation. These include specialized storage facilities, strict adherence to international safety standards, routine inspections, and emergency response mechanisms to mitigate risks. The port's efficient handling of ammonium nitrate is crucial for supporting India's agricultural sector, as the chemical is a vital component in nitrogen-based fertilizers, which enhance crop productivity. Additionally, it plays a significant ro'e in mining and construction industries, contributing to economic growth and infrastructure development. By maintaining robust safety measures, the Visakhapatnam Port Authority ensures the uninterrupted supply of this critical commodity while safeguarding the environment and public safety.

The following other ports in India are permitted to import Ammonium Nitrate, they are

1) Paradip Port
2) Karanja Port
3) Tuticorin Port
4) Cochin Port
5) Chennai Port
6) Vishakhapatnam Port
7) Diamond Harbour (Kolkata)

The Ports Importing Ammonium Nitrate **Annexure 2**
The Visakhapatnam Port Authority Traffic Department Trade Circular **Annexure 3**
The Cochin Port Authority Report **Annexure 4**
The VOC Trade Notice **Annexure 5**
SOP at Paradip Port **Annexure 6**

It is to be noted that for handling every ammonium nitrate vessel, the following Statutory Authorities are informed prior to berthing of vessel.

1. District collector
2. Commissioner of Police
3. Commissioner Intelligence Bureau
4. Asst. Director, Dock Safety
5. APPCB
6. The Commandant, Naval Office -in –charge
7. The Commandant, Indian Coast Guard
8. The.Commandant, CISF

The 1st Respondent depends upon the demand of the Ammonium Nitrate for the following industries, importing Ammonium Nitrate as follows: (Uses **Annexure 7)**

S.No.	Sector	Application
1	Agriculture	High Nitrogen content make it extensively used in Fertilizers
2	Mining	Blasting Rocks
3	Medicine	Cold packs for injury treatment, Antibiotics
4	Defence	Oxidising agent in pyrotechnics
5	Food	Cure meat, flavour, pink colour, Yeast
6	Rocket propulsion	Oxidiser
7	Construction	Concrete
8	Matches	safety matches
9	Explosives	Mixed with fuel oil to produce Ammonium Nitrate Fuel Oil commonly employed in mining and demolition

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8) The 9th Respondent submits that the **Sources and Imports** of Ammonium Nitrate in India are primarily used in sectors including :

a. **Fertilizer Industry (Agriculture)**
Nitrogen Fertilizers: Ammonium nitrate is a key source of nitrogen, which is a crucial nutrient for plant growth. As a high-nitrogen fertilizer, it promotes the healthy growth of crops, increasing their yield. It is often used in combination with other fertilizers to enhance soil quality and ensure better crop productivity, especially in regions with low nitrogen levels in the soil.

b. **Industrial Applications**
Explosives Manufacturing: Ammonium nitrate is a critical raw material for producing explosives, such as in the mining, quarrying, and construction industries. It is often used in the form of ANFO (Ammonium Nitrate Fuel Oil), which is a mixture of ammonium nitrate and fuel oil.

c. **Defence and Security Uses:** In addition to its use in civilian explosives ammonium nitrate can be used in the production of military-grade explosives, although strict regulations govern its usage due to safety and security concerns.

Ammonium nitrate is produced both domestically and through imports, as India has limited domestic production capacity to meet the demand for ammonium nitrate in agriculture and Industry.

d. **Domestic Production**
Fertilizer Companies: India has several large fertilizer manufacturers that produce ammonium nitrate. These include:
(i) Rashtriya Chemicals and Fertilizers (RCF)
(ii) National Fertilizers Limited (NFL)
(iii) Coromandel International
(iv) BASF India

These companies produce ammonium nitrate as part of their fertilizer production processes, though the volume of domestic production is often insufficient to meet total demand.

- **Imports**

Imports of Ammonium Nitrate: Due to higher demand and insufficient domestic production capacity, India imports a significant portion of its ammonium nitrate requirements. The largest sources of ammonium nitrate imports to India are countries like Russia, China, Jordan, Turkey, Ukraine.

These countries have large-scale production facilities and supply ammonium nitrate atcompetitive prices. Imports are especially significant in times of increased demand, such asduring the sowing season in agriculture or peak periods of industrial production.

Ammonium nitrate in India serves primarily as a nitrogen fertilizer and as a key ingredient inexplosives manufacturing. While there is domestic production by companies like RCF, NFL,and others, India still imports a significant quantity of

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ammonium nitrate from countries likeRussia, China, and Turkey to meet the demand for its agricultural and industrial uses.

9) The 9th Respondent submits that the Central Government permitting VPA to import Ammonium Nitrate for the following reasons: VPA has vital role in importing the Ammonium nitrate which is a crucial raw material in India's industrial and manufacturing sectors, widely used in the production of fertilizers for agriculture and as a blasting agent in mining, quarrying, and infrastructure development. The import of ammonium nitrate through seaways, particularly via the Visakhapatnam Port, offers significant advantages, including cost-effectiveness, bulk handling capabilities, and seamless connectivity to domestic markets. Visakhapatnam Port, with its strategic location and efficient logistics, serves as a vital entry point for ammonium nitrate destined for industries in East and Northeast India. These regions, rich in natural resources, rely heavily on ammonium nitrate for mining operations and infrastructure projects such as road and railway construction. The port's modern infrastructure and safety protocols ensure the secure handling of this hazardous material, facilitating a steady supply to industries while reducing transportation costs and delivery timelines. This efficient import mechanism strengthens industrial growth, supports regional economic development, and enhances India's overall industrial output.

The 9th Respondent submits that the Ammonium nitrate is predominantly imported through Visakhapatnam Port due to its strategic location, advanced infrastructure, and proximity to major industrial and agricultural regions in India. Scientifically, the port's favourable climatic conditions, including low humidity levels, reduce the risk of ammonium nitrate degradation or accidental reactions during storage and handling. Visakhapatnam Port is equipped with state-of-the-art facilities for handling hazardous materials, including specialized storage warehouses, ventilation systems, and trained personnel, ensuring compliance with stringent safety protocols. Additionally, the port's well-developed connectivity via rail and road networks enables the efficient transportation of ammonium nitrate to major industrial belts, such as those in Andhra Pradesh, Telangana, Odisha, and Chhattisgarh. Compared to other ports like Paradip, Visakhapatnam offers shorter transit times to these regions, lowering logistical costs and ensuring timely supply for critical sectors like agriculture, mining, and construction. These factors make Visakhapatnam Port a preferred choice for ammonium nitrate imports in India.

10) The 9th Respondent submits that the **Characteristics of Pure Ammonium Nitrate (AN)**are, they are white or colorless, water soluble, crystalline substance with a melting point of 170 deg Celsius. The substance is classified as an oxidizing agent Class 5.1 (UN1942). It is one of the base ingredients used in the manufacture of commercial explosives. Due to this reason Ammonium Nitrate has been declared as an explosive and defined in Rule 2(b) of the Ammonium Nitrate Rules 2012. **Ammonium Nitrate is not an explosive by itself.** However it is one of the ingredients used for the manufacture of explosives. It is classified as an oxidizer as per UN classification for Dangerous Goods. Other ingredients life fuel, etc. have to be added two make it an explosive..For such explosive mixture to explode, initiators life detonators are required. Is the vide notification No G.S.R. S.O 1678(E) dated 21.07.2011, Ammonium Nitrate of any combination containing more than 45 per cent of ammonium nitrate by weight including emulsions, suspensions, melts of gels (withdrawal of without inorganic nitrates) shall be deemed to be an explosive under the meaning of the Explosives Act 1884. Provide that such ammonium nitrate of any

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combination thereof shall not include those fertilizers from which ammonium nitrate cannot be extracted by any physical our chemical means.(**Britannica - Annexure8)**

11) The 9th Respondent submits that the VPA undertake that, they **imported Ammonium Nitrate is of Fertilizer grade only,** and has been duly notified to the APPCB, Visakhapatnam. Fertilizer-grade ammonium nitrate is a high-demand import at Visakhapatnam Port, primarily used in agriculture to enhance soil fertility and boost crop yields. This grade of ammonium nitrate has a nitrogen content optimized for plant growth, making it an essential component in nitrogenous fertilizers. It differs from industrial or explosive-grade ammonium nitrate in terms of purity, additives, and intended use. Fertilizer-grade ammonium nitrate is treated with anti-caking agents to ensure safe handling, storage, and application, while explosive-grade ammonium nitrate is purer and often used as a precursor for industrial explosives in mining and construction. (GuidanceforSea Transport of Ammonium Nitrate based Fertilizer **Annexure 9)**

The benefits of fertilizer-grade ammonium nitrate lie in its ability to release nitrogen efficiently, promoting faster and healthier crop growth. It is particularly effective in regions with high agricultural output, ensuring food security for India's growing population. Additionally, it dissolves readily in water, making it suitable for various soil types and irrigation systems.

Unlike its explosive-grade counterpart, fertilizer-grade ammonium nitrate is specifically formulated to prevent misuse. Regulations in India further ensure that its handling, import, and distribution strictly follow safety guidelines, reducing any risk associated with its storage and transport. Visakhapatnam Port, with its advanced infrastructure and connectivity, serves as a key hub for importing this essential fertilizer grade, efficiently distributing it to agricultural and industrial belts across India.

The formulation of fertilizer-grade ammonium nitrate typically consists of around 33-34% nitrogen content, making it a highly effective nitrogenous fertilizer. It is often mixed with other compounds, such as limestone or dolomite, to reduce its explosive potential and improve its handling characteristics. These additives, combined with the granulated or prilled form of the fertilizer, help prevent caking and ensure safe transportation and storage.

While pure ammonium nitrate is a highly oxidizing substance and can become explosive under specific conditions (e.g., exposure to high heat, contamination, or improper storage), the fertilizer-grade variant is designed to minimize this risk. The inclusion of inert materials and anti-caking agents reduces its sensitivity and reactivity, making it unsuitable for direct use as an explosive. However, it is still classified as a hazardous material, and its storage and handling are governed by strict safety protocols to prevent any accidents or misuse.

In India, fertilizer-grade ammonium nitrate is regulated under the Ammonium Nitrate Rules, 2012, ensuring that it is stored, transported, and distributed safely, primarily for agricultural purposes.

12) The 9th Respondent submits that the **Safety Protocols Followed in VPA are as follows:**
It may be noted that inspections were carried out by DGFASLI and reports were submitted to APPCB for permitof VPA to handle Ammonium Nitrate.

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It is to be noted that for handling every ammonium nitrate vessel, the following Statutory Authorities are informed prior to berthing of vessel.

1. District collector
2. Commissioner of Police
3. Commissioner Intelligence Bureau
4. Asst. Director, Dock Safety
5. APPCB
6. The Commandant, Naval Office -in –charge
7. The Commandant, Indian Coast Guard
8. The Commandant, CISF

VPA had stringently followed and implemented the mandated procedure of APPCB by unloading the imported Ammonium Nitrate in bags from the ship on to the wharf for subsequent loading onto container/trucks for onward transportation to the final destination through container trains / roadways, without storing the Ammonium Nitrate in the port or the godowns in and around the port.

Whenever an Ammonium Nitrate vessel arrives at VPA for handling cargo the following undertaking is taken from Handling Agent, before commencement of discharge operations.

- They undertake that, the **imported Ammonium Nitrate is of Fertilizer grade only,** and has been duly notified to the APPCB, Visakhapatnam.
- An undertaking from the cargo owners is taken that the said cargo is well within the stipulated conditions and standards as per Environment Protection Act, 1986. All 11 provisions of manufacture, storage and import of hazardous chemical Rules (MSIHC) 1989 Framed under in environment protection act 1986 would be strictly followed.
- They also undertake to take a valid insurance policy under PLI act 1991 and this port ensures that a copy of the same is submitted before birthing of the vessel.
- They also undertake that the second cargo has a property of giving of oxygen when involved in fire and mixtures of these substances are readily ignited with a combustible material. Therefore, all the places/Area areas on the shore or warehouse will be thoroughly cleaned and dried prior to receipt of this cargo.
- They will ensure that the wharf is fully cleaned by them and that no cargo whatsoever is left on the wharf after completion of discharge of the vehicle.
- For strictly ensure that the vehicle speed at birth will not be more than 20 kmph And the drivers will be instructed not to apply sudden breaks, and also that all the vehicles and cargo moving equipment are in good condition to ensure that they do not leak any mineral oils.
- 30 metre are a on the berth is cordoned and ensure no unauthorized person are permitted
- The drivers of the vehicles and cargo moving equipment carrying ammonium nitrate of fertilizer. Grade are instructed to ensure no leakage of oil/Fuel from the vehicle taken place
- The handling agent gives requisition of stand by "fire watch" from the time vessel is berthed till the vessel is berthed along with our C&F Agent Deposit Account Number.
- They will inform the port fire officer before berthing And commencement of discharge of the cargo
- The consignee/owner and vessel's Agent wall indemnify the Visakhapatnam port trust for any damage/Injury to the port property, personnel etc. of even any

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liabilities rising out or damage to third-party during the time of unloading the cargo from the vessel (copy enclosed)

- They undertake to assist the port to ensure that no unauthorized personnel are allowed in the working area
- They also ensure that the trucks/ dumpers are not loaded beyond the brim to avoid spillage of the cargo. They will also ensure that the trucks are suitably covered through the entire journey till storage area.
- They will ensure that all workers engaged in handling of this cargo shall wear personal protective equipment.
- The handling agents 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.
- They undertake to 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.
- 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
- 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.
- 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 powdered metals and substances containing metals such as the chromium, copper, cobalt, Nickel, Zinc and their alloys and fibrous materials (eg. Cotton, Jute, sizal, saw dust etc.). The said cargo will be separated from all other goods.
- Bunkering or pumping of fuel oil will not be allowed during the unloading operation.
- 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 firefighting personnel should be present along with appropriate firefighting appliances during the entire period of unloading the said cargo from the vessel.
- 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.
- They will comply with the rules mentioned in the column 3 & 4 of schedule 2 of manufacture storage, import of hazardous chemicals (MSIHC) Rules 1988 as amended.
- They undertake to comply with the rule 15 & 18 of MSIHC rules.
- They will comply with the central Motor vehicle rules framed under the provisions of Motor Vehicle Act 1988.
- 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.
- The code of practice prescribed by United Nations guidelines on transportation of hazardous substances and chemicals will be strictly followed.

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- The bagged cargo is 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.

It is not out of place to mention that, there was no instance of any untoward incident during handling of Ammonium Nitrate (fertilizer grade) at VPA during the past 20 years due to implementation of the mandated procedure of APPCB while unloading the imported Ammonium Nitrate in bags and subsequent transportation of destination.

12. The 9th Respondent submits that **Exposure of Ammonium Nitrate would not amount to be explosive** until unless it get contacted with any fuel or other ingredients like fire. **The most common risk associated with exposure to Ammonium Nitrate in human is that**

- It is irritating to the eyes, nose, throat, and mucus membranes.
- Inhalation of this compound can cause severe lung, congestion, coughing, difficulty in breathing and increased acid urine.
- Exposure to large amount can cause systemic acidosis, and abnormal haemoglobin. It is considered to have law toxicity Since it causes readily reversible tissue changes that disappear when exposure stops.
- In the body, nitrates are converted to nitrates, which can oxidize haemoglobin to methaemoglobin and lead to cyanosis.
- They can also cause unconsciousness, dizziness, fatigue, shortness of breath, nausea, and vomiting.
- The skin becomes warm and sweaty, and later becomes cold due to vasodilation.
- It causes coronary blood vessel contraction, bradycardia, atrial fibrillation, cardiac ischemia, Headache, convulsions and diarrhoea. Nitrate transferred through breastmilk causes methaemoglobinemia in infants.
- Infants are more predisposed to nitrate related toxicity than adult due to decreased ability to secrete gastric acid, higher levels of fatal, haemoglobin and diminished enzymatic capability to reduce methaemoglobin to haemoglobin.

(ICSC 0216: ILO and WHO - Annexure10) (Health effects from ammonium nitrate. Peso.gov.in- Annexure 11) (Hazardous Substances Fact Sheet Annexure 12)

A case study was conducted for the consumption of Ammonium Nitrate which resulted in no fatality. With this regard the 9th Respondent submits the case study report published in The Journal of Emergency Medicine:

"Disposable ammonium nitrate cold packs are widely used in emergency departments instead of ice bags. Five confused or suicidal patients who tore open a pack and ingested from 64 to 234 grams of ammonium nitrate in a single dose, and another patient who attempted to do so, are reported. It is known that chronic ingestion of 6 to 12 grams/day of ammonium nitrate may cause gastritis, acidosis, isosmotic diuresis, and nitrite toxicity manifesting as methaemoglobinemia or vasodilatation. None of these patients developed severe toxicity, although three had symptoms of gastritis, three had slight methaemoglobinemia, and two had mild hypotension. The product was removed from the stomach promptly in three of the five patients. None had pre-existing renal or intestinal dysfunction, which are known to enhance ammonium nitrate toxicity."

Nowhere it has been proved that either exposure or intake of ammonium nitrate is fatal. (The Journal of Emergency Medicine - **Annexure 13**)

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13. The 9th Respondent submits that **Ammonium Nitrate has a major role to play in Indian Economy as** the Indian economy is one of the fastest-growing in the world, driven by its vast agricultural sector, industrial activities, and infrastructure development. Ammonium nitrate plays a crucial role in this growth, particularly in supporting agricultural productivity, which is vital for ensuring food security for India's growing population. As a key component in fertilizers, ammonium nitrate significantly boosts crop yields, helping farmers meet the demands of a rapidly increasing population. Additionally, it is indispensable in the construction and mining industries due to its use in industrial explosives, which are critical for infrastructure projects such as road building, tunnelling, and resource extraction. The absence of ammonium nitrate imports would severely impact agricultural output, potentially leading to food shortages and rising prices, while also stalling infrastructure projects that are crucial for economic progress. This would not only hinder India's development goals but also strain its economy by increasing dependency on costlier alternatives and reducing global competitiveness in key sectors.

14. The 1st Respondent, on 10.03.2023 sent a detailed letter to the 2nd Respondent stating that in paragraph 2, Ministry of Coal have informed that Coal India Limited, Singareni Collieries Company Limited consumed large quantities of explosives in their daily operations. The decision of Government of Andhra Pradesh to phase out the handling of Ammonium Nitrate through VPA will be detrimental to the Coal and Fertilizer Industry and will derail the process of mining as well as fertilizer manufacturing of the supply of cargo is put under uncertainty.

In **Para 3,** It is to uprise that short supply of Ammonium Nitrate will seriously impact production of coal which in turn affect the power generation. The demand of explosives cannot be met through domestic production and shortage of ammonium nitrate will prevail for next several years.

In **Para 4,** you are therefore requested that Government of Andhra Pradesh may reconsider the decision of phasing out import of Ammonium Nitrate through VPA in light of above stated position (as requested be Ministry of Coal and VPA), which was mentioned in **ApplicantAnnexure 9** by the applicant. **Applicant Annexure 11** Letter dated 14.09.2023, **Applicant Annexure 13** dated 01.11.2023, **Applicant Annexure 15** Ministry of coal dated 20.03.2024. All the above letters clearly show that the importance of the import of Ammonium Nitrate is crucial for the country's economic and development and safeguard the human beings and animals. Thereby the allegations of the applicant are assumptions and pre assumptions, taking the precautionary principles are not applicable to the present case. Hence the1st Respondent and 9th Respondent actions of importing Ammonium Nitrate is justifiable cause for the human beings and other living beings (animals and plants) especially for the national interest.

15). The 9th Respondent submits that the 8th Respondent by their letter dated 19.07.2024 and 14.08.2024 sent letters to DGFASLI to seeking report whether permit the 9th Respondent (VPA) to import Ammonium Nitrate. In this regard, 09.09.2024, the DGFASLI send a report to 8th Respondent (APPCB) given directions or recommendations to the VPA to comply. Further, APPCB forwarded the said report of DGFASLI to 9th Respondent and directed to comply the recommendations and in this regard, the 9th Respondent by their letter dated 07.11.2024 (**Annexure 18 along with Compliance report & documents**) sent the reply to DGFSALI stating that they were complying the recommendations of the DGFASLI along with complying Report with supportive documents. Thereafter, the DGFASLI once again sent 7

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recommendations by their letter dated 18.11.2024 (**Annexure 19)** to comply based the 9th Respondent complying Report. In this regard, the 9th Respondent once again sent a letter dated 07.01.2025 (**Annexure 20 along with Compliance report & documents**) and 04.02.2025 (**Annexure 21)** to the DGFASLI and also 8th Respondent APPCB the complying report and requested to give no objection for permit to import Ammonium Nitrate. In this regard, the DGFASLI by their letter dated 10.03.2025 (**Annexure 22)** stated that they have no power to issue the No Objection certificate and directed the 9th Respondent to approach the 8th Respondent in this regard. Hence, the 9th Respondent sent a letter dated 18.03.2025 (**Annexure 23)** to the 8th Respondent to give the No Objection certificate for permitting the 9th Respondent to import the Ammonium nitrate and awaiting their permission and reply yet received from the 8th Respondent.

16). The 9thRespondent submits that Earlier VPA handled notable quantity of Ammonium Nitrate. Visakhapatnam Port Authority (VPA) made several request to Special Chief Secretary, E.F.S&T Department of AP regarding the Ministry of Ports, Shipping and Waterways (MoPS&W) letter wherein the Ministry requested the Government of Andhra Pradesh to reconsider their decision and allow VPA to continue handling of Ammonium Nitrate beyond 05.01.2024, as the latest permission for handling Ammonium Nitrate through Visakhapatnam Port was accorded up to 05-01-2024, only.

17). The 9thRespondent submits that handling the import of Ammonium Nitrate safely while unloading and transporting the same to stevedore as per the 1st and 6thRespondent directions. No history of accident is there while handling the import of Ammonium Nitrate by the 9thRespondent in the last 20 years. Hence the interim relief sought by the applicant has become infructuous since the Application was moved on 26.06.2024 filed the above application, however the 9thRespondent handled the said cleared cargo from Lady AYANA and discharged the ship on 22.01.2024. Hence the prayer for the interim relief sought by the applicant is not maintainable and is liable to be rejected.

18). The 9thRespondent **denies all the allegations** of the Applicant in Paragraph 2 to 23 and Grounds A to L and the Applicant strict to proof of the same.

19). As far as paragraph 2 is concerned the 9thRespondent is complying the order of this Tribunal passed is OA No 68 of 2015 and further if is to mention that AAQ values at above stations exist due to non-port operations such as heavy goods traffic movement, continuous public transport on NHAI and GVMC road, civil construction work carried out by the public private agencies, welding activities, unauthorized burning of garbages, and plastic waste, and also burning of tyres from the automotive shops leased by the GVMC all around the existing CAAQM stations. The R&D yard is the online station surrounded by the port operations where the AAQ values are within the limits of NAAQ standards.

20). As per the member secretary, APCZMA via letter number 30/APCZMA/GC/2023 dated 10.04.2024, recommended as per 5(D), if VPA shall also carry out AAQ monitoring system at desk generating sources manually till automatic CAAQMS established, VPA issued work order for manual monitoring AAQ by gravimetric method vs MSV Analytical Laboratory on dated 03.04.2024. This work commenced in the month of April, 2024. In continuous VPA issued work order for manual monitoring

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AAQ by gravimetric method vs M/s. Arihant Analytical Laboratory on dated 10.03.2025

21). As far as **paragraph 3** is concerned the 9th Respondent denies all the allegations of the Applicant and they have to strict to the proof of the same.

22). The 9th Respondent is providing facility for importing Ammonium Nitrate of fertilizer grade and not importing explosive grade of Ammonium Nitrate. The explosion of Ammonium Nitrate will occur only with the addition of additional fuel or any other ingredients. The 9th Respondent after unloading from the ship, in bags, transports them immediately to vendor's licensed storehouses, which are not located in populated areas. The 9th Respondent is not storing Ammonium Nitrate, imported by sea, in their warehouse as per the Ammonium Nitrate Rules 2012. Hence the allegations of the Applicant that importing Ammonium Nitrate would amount to explode and it is only assumptions and presumptions, though from past 20 years, the 9th respondent is importing Ammonium Nitrate as on date no accident took place due to the safety rules and regulations followed by the 9th respondent, it being the international standard of safety measures and having full infrastructure handling the same.

23). As far as the **paragraph 4 and 5** is concerned, the 9th Respondent handled the Ammonium Nitrate outer harbour. The 9th respondent has 3 harbours mainly 1) the outer harbour 2) inner harbour and 3) the fishing harbour. The outer harbour has 7 berths capable of handling vessels with a draft upto 17 m, while the smaller inner harbour has 22 berths that are panamax compatible. The dolphin nose hill to the north of the entrance channel protects the harbour from cyclones that strike the east coast. There is no history of accident taking place in handling ammonium nitrate by the 9th respondent as on date.

24). As far as **paragraph 6** is concerned, the 9th respondent denies the allegations that the ammonium nitrate import increased by the 9th respondent and the applicant strict to proof of the same. On the other hand, the 9th respondent giving the following details, ammonium nitrate imported by 9th respondent for the following 5 years as follows.

Year	Tonnage	Vessels Count
2023-24	3,63,698	20
2022-23	2,22,316	16
2021-22	1,98,788	20
2020-21	2,10,976	18
2019-20	2,48,991	19
2018-19	2,46,235	22
2017-18	1,48,904	13

The above facts shows that year 2023-24 upto 05.01.2024 as per APPCB Approval Lr. No. 724/APPCB/HO/ECS/TF/VSP/2023 dated 12.08.2023. As per APPCB conditions VPA handled upto 05.01.2024 as per SOP of VPA with all safety measures at the time of cargo handling at port. (SOP enclosed as **Annexure – 17**)

25). As far as **paragraph 7** is concerned, the 9th respondent denies all allegations that the 9th respondent violated the rule 12 (6) of the AN Rules 2012 restricts maximum storage to 5000 tonnes in any licensed store house.

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26). On the other hand, the 9th respondent clearly states that "the ammonium nitrate chemical imported to India by seaand it cannot be stored in port, according to the Ammonium Nitrate rules 2012 upon unloading from the ship, the chemical should be immediately shifted from the port to the stevedores licensed storehouse which should not be located in populated areas. It can be dispatched from the store house only in bagged form." Hence the allegations of the applicant that 9th respondent storing the ammonium nitrate inside the port premises and violating rule 12(6) of the AN Rules 2012, is not correct. And the applicant is strict to proof of the same. The said rule is only applicable to the stevedores licensed store house, where the ammonium nitrate is stored. **(Clause 6(4)(d) of AN Rules 2012 Annexure 14)**

27). As far as **paragraph 8 to 9** is concerned, 9th respondent denies all the allegations and the applicant is strict to proof of the same.

28). The 9th respondent submits that immediately shipment of ammonium nitrate shifted from the port to the stevedore licensed store house which should not be located in populated areas. Since the 9th respondent is not storing the ammonium nitrate, the question of explosion doesn't arise, especially without addition of fuel or any other ingredients, which is not taking place while loading or unloading the 9th respondent premises. Further the 9th respondent denies the accidents mentioned in paragraph 9 which has nothing to do with the ammonium nitrate accidents. Further No toxic, corrosive or flammable or otherwise dangerous substances such as carbonaceous matter, reducing agents, petroleum which may react with the Ammonium Nitrate shall be allowed in the premises of import. Hence the accident shown as the purpose of handling ammonium nitrate is not correct. Hence the allegations of the applicant are liable to be rejected. **(Clause 6(9) of AN Rules 2012 Annexure 14)**

29). As per the **paragraph 10 and 11** is concerned, the applicant relied on the Beirut explosion at port of Beirut, Lebanon accident. The Beirut accident in 2020 is one of the most devastating incidents involving ammonium nitrate in recent history. It occurred when approximately 2,750 tons of ammonium nitrate, which had been stored unsafely in a warehouse at the Port of Beirut for over six years, detonated following a fire. The blast caused extensive damage across the city, killed over 200 people, injured thousands, and left widespread destruction. This tragic incident was the result of prolonged and improper storage without adequate safety measures, highlighting the critical need for stringent regulatory protocols in handling hazardous materials. The accident was due to several factors including the chemical cargo being held in Beirut port for 6 long years presuming technical issue. The first responders to the fire outbreak were unaware about the presence of explosive material, Ammonium Nitrate in the hanger, and the blast occurred in populated area. **(Disaster Med Public Health Prep 2020 Annexure 15)**

30). The 9th Respondent submits that the **Scientific Evidence Contradicting the Applicant's Allegations are that** scientific studies and expert opinions affirm that ammonium nitrate, when handled and stored in accordance with established safety protocols, poses minimal risk to human life and the environment. According to a report by the International Fertilizer Association (IFA), ammonium nitrate is a stable compound under normal conditions and is unlikely to detonate unless exposed to extreme heat, contamination, or improper handling. Additionally, research from the United Nations Committee of Experts on the Transport of Dangerous Goods emphasizes that adherence to proper storage, segregation, and monitoring protocols significantly minimizes any potential hazards associated with ammonium nitrate.

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31). A critical distinction between the tragic Lebanon incident and the practices at Visakhapatnam Port lies in the adherence to these safety protocols. In the Beirut case, ammonium nitrate was stored for over six years in a poorly ventilated warehouse, alongside incompatible materials, and without regular inspections, creating conditions that led to the catastrophic explosion. In contrast, the handling of ammonium nitrate at Visakhapatnam Port strictly complies with India's Ammonium Nitrate Rules, 2012, and the Manufacture, Storage, and Import of Hazardous Chemicals Rules, 1989. These regulations mandate proper segregation of ammonium nitrate from flammable materials, controlled ventilation, temperature monitoring, and regular safety audits by authorities. **(Disaster Med Public Health Prep 2020 Annexure 15)**

At Visakhapatnam Port, ammonium nitrate is not stored in Port Premises for safety. Additionally, it is handled by trained personnel under continuous supervision, with emergency response measures in place. These stringent measures not only reduce the risk of accidents but also demonstrate India's commitment to prioritizing safety in the handling of hazardous materials

In contrast, VPA in India has an exemplary track record of handling ammonium nitrate safely from the past 20 years, thanks to its comprehensive and strictly enforced regulatory framework. The Manufacture, Storage, and Import of Hazardous Chemicals Rules, 1989, along with the Ammonium Nitrate Rules, 2012, govern the import, storage, and usage of ammonium nitrate in India. These protocols mandate secure storage, proper labelling, and regular inspections, significantly reducing risks. Consequently, India has not witnessed any major accidents involving ammonium nitrate, showcasing the effectiveness of these stringent measures.

Globally, several countries with advanced safety regulations have demonstrated that ammonium nitrate can be handled without significant risk. For instance, Australia and Canada have strict guidelines for its import, storage, and usage, ensuring safe applications in agriculture and industry. Similarly, the United States enforces rigorous protocols under its Occupational Safety and Health Administration (OSHA) and Department of Homeland Security (DHS) regulations, ensuring the safe handling of ammonium nitrate. These examples reinforce the fact that with proper regulatory oversight, ammonium nitrate can be managed safely to support economic and industrial activities without compromising human safety or the environment.

32). As far as the **paragraph 12 to 23** is concerned, the 9th respondent denies the allegations of the applicant. The 9th Respondent submits that the ammonium nitrate users like fertilizer industries, mining sectors, pharmaceutical industries, food industries have requested the Central Government to permit them to import the ammonium nitrates. The Central Government considered the demands of these industries, giving license to 9th respondent along with the permission of the State Government. The Central Government is permitting the 9th respondent as well as other major ports to import ammonium nitrate. The Central Government mainly permits the ammonium nitrate, giving license to the 9th respondent mainly ammonium nitrate user company situated in Odisha, Chhattisgarh and Andhra Pradesh. The proximity of Visakhapatnam Port to these industrial belts ensures efficient transportation and distribution of goods, thanks to its robust rail and road connectivity. This logistical advantage minimizes costs and ensures timely delivery, making the port a vital gateway for the supply chain of ammonium nitrate and other essential commodities in these industrially dense regions.

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33). The Indian economy is one of the fastest-growing in the world, driven by its vast agricultural sector, industrial activities, and infrastructure development. Ammonium nitrate plays a crucial role in this growth, particularly in supporting agricultural productivity, which is vital for ensuring food security for India's growing population. As a key component in fertilizers, ammonium nitrate significantly boosts crop yields, helping farmers meet the demands of a rapidly increasing population. Additionally, it is indispensable in the construction and mining industries due to its use in industrial explosives, which are critical for infrastructure projects such as road building, tunnelling, and resource extraction. The absence of ammonium nitrate imports would severely impact agricultural output, potentially leading to food shortages and rising prices, while also stalling infrastructure projects that are crucial for economic progress. This would not only hinder India's development goals but also strain its economy by increasing dependency on costlier alternatives and reducing global competitiveness in key sectors.

34). Hence the allegations that the 9th respondent as if they are directly importing ammonium nitrate to the industries is false. The VPA is distributing the ammonium nitrate only after obtaining a license from the Central Government, State Government and various other authorities. Without the license from the Central Government or permission from state government the 9th respondent cannot import the ammonium nitrate. Thereby, the allegations of the applicant are false that 9th respondent importing the ammonium nitrate by violating the various rules and regulations of AN Rules 2012 and 2016.

Scientific advancements bring both benefits and challenges, as they often involve a balance between progress and risk. The use of ammonium nitrate plays a vital role in the development and growth of a country, especially in agriculture and infrastructure projects. While it has explosive properties, its controlled usage is essential for advancing sectors such as farming and construction. For example, nuclear power stations, despite their inherent risks, are being developed to meet the growing energy needs of nations. The potential for danger exists in both cases, yet with stringent safety protocols in place, the benefits far outweigh the risks. Therefore, importing ammonium nitrate should not be viewed as a threat to India, provided that proper safety measures and regulations are adhered to, ensuring its responsible use for national progress.

35). As far as **GroundsA, B, C, E, F, G** is concerned, 9th Respondent denies that they have violated the Rule 13 of Environment Protection Act, Section 3, Read with Environment Protection Rule 13, Ammonium Nitrate Rules 2012, Rule 6(4)(b) and 6(4)(c), by not considering the potential damage that would be cost the environment, human beings and other living creatures, plants and properties. And further, damage to several strategic defence equipments would be damaged and destroyed. On the other hand, It is to be noted that for handling every ammonium nitrate vessel, the following Statutory Authorities are informed prior to berthing of vessel and safeguarding the Ammonium Nitrate.

1. District collector
2. Commissioner of Police
3. Commissioner Intelligence Bureau
4. Asst. Director, Dock Safety
5. APPCB
6. The Commandant, Naval Office -in –charge
7. The Commandant, Indian Coast Guard
8. The Commandant, CISF

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36). The 9th Respondent further submits that the Naval Office, Indian Coast guard and CISF permissions are obtained before berthing of vessel. Hence the allegations of the applicant are liable towards be rejected. Further while unloading the Ammonium Nitrate, it will not explode, as the import is only fertilizer grade. Also, if any fuel or other ingredients are included, then only Ammonium Nitrate will possibly explode. Thereby the allegations of the applicant that importing Ammonium Nitrate will cause the environment, human beings, living beings and other property is false and the said contention of the applicant is liable to be rejected. If the Ammonium Nitrate is not imported or demand of supply is reduced, it will create a large impact on food supplies because without fertilizer, plant growth will be affected. Food supplies for human beings and animals are affected. Further, coal industries also get affected which in turn impact the country's power generation. This inturn will affect employment in rural and urban areas. Overall, the welfare of entire human beings as well as the National economy will be affected.

37). As far as **Ground D** is concerned, the applicant mentions the disaster taken place in warehouse in Tianjin, a Chinese port city in 2015 and Beirut explosion in 2020 citing the examples for prohibiting the import of ammonium nitrate. The 9th Respondent is denying the above said allegations of the applicant. As per the report of the Disaster Med Public Health.Prep, the Beirut explosion is clearly stated that, "**the direct cause of this incident was being investigated and the theories ranged from the deliberate attack on the storage site to an accidental explosion of a large volume of explosive chemical material stored in an unsafe manner. The chemical cargo was present in the hanger for over 6 years after the Lebanese Port Authorities confiscated it from a ship that entered the port to transport additional cargo but, presumed technical reasons, the chemical cargo was unable to proceed with its journey from Georgia to Mozambique**." The said press report is enclosed as Annexure. (**Disaster Med Public Health Prep 2020 Annexure 15)**

38). As far as Tianjin Explosion is concerned, the Chinese investigators identified the immediate cause of the accident was the spontaneous ignition of overly dry nitrocellulose (gunpowder) stored in a container that over-heated according to the report issued on February 5. Wetting agents inside the container had evaporated in the summer heat, investigators found. Flames from the initial fire reached nearby the ammonium nitrate fertilizer which exploded. Investigators determined that the accident add a fairly limited impact on the local environment. Marine life in the Bhopal bay, outside Tianjin, was not affected, the investigations found. And although hundreds of tons of sodium cyanide was also stored at the warehouse, none died of poisoning, the report added. (**Report of CEN (Chemical and Engineering News) Annexure 16)**

39). The above two reports clearly states that ammonium nitrate was illegally stored in the warehouse in Beirut, and as far as Tianjin case, the initial fire outbreak was caused by nitrocellulose and it was the major reason for igniting the ammonium nitrate, and ammonium nitrate alone is not responsible for the explosion. Hence applicant relying on the above two accident explosions, for importing ammonium nitrate in India is not applicable to the present case, since as per our Ammonium Nitrate Rules 2012, the ammonium nitrate is not permitted to be stored in the port premises. Hence the application is liable to be dismissed.

40). The 9th Respondent further submits that **Exposure of Ammonium Nitrate would not amount to be explosive** until unless it get contacted with any fuel or other

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ingredients, like fire. **The most common risk associated with exposure to Ammonium Nitrate in human is that**

- It is irritating to the eyes, nose, throat, and mucus membranes.
- Inhalation of this compound can cause severe lung, congestion, coughing, difficulty in breathing and increased acid urine.
- Exposure to large amount can cause systemic acidosis, and abnormal haemoglobin. It is considered to have law toxicity since it causes readily reversible tissue changes that disappear when exposure stops.
- In the body nitrates are converted to nitrates, which can oxidize haemoglobin to methaemoglobin and lead to cyanosis.
- They can also cause unconsciousness, dizziness, fatigue, shortness of breath, nausea, and vomiting.
- The skin becomes warm and sweaty, and later becomes cold due to vasodilation.
- It causes coronary blood vessel contraction, bradycardia, atrial fibrillation, cardiac ischemia, Headache, convulsions and diarrhoea. Nitrate transferred through breastmilk causes methemoglobinemia in infants.
- Infants are more predisposed to nitrate related toxicity than adult due to decreased ability to secrete gastric acid, higher levels of fatal, haemoglobin and diminished enzymatic capability to reduce methaemoglobin to haemoglobin. **(Report of International Group of experts on behalf of ILO and WHO Annexure 10)**

As far as **Ground K & L** is concerned, the applicant relied on the Vellore Citizen Welfare Forum case under the **Precautionary Principle** and sought for the ban of import of ammonium nitrate. The 9th Respondent submits that precautionary principle cannot be followed in the present case for the following reasons.

- The applicant has not shown any evidence before this Tribunal to prove that the explosions occurred during the export and import of Ammonium Nitrate in India.
- The 9th Respondent has an exemplary record of handling Ammonium Nitrate for the past 20 years.
- The 9th Respondent is importing the ammonium nitrate, only after permission given by the Central and State Government.
- The 9th Respondent obtained prior permission to handle every ammonium nitrate vessel, with the following Statutory Authorities in prior to berthing of vessel.

  I. District collector
  2. Commissioner of Police
  3. Commissioner Intelligence Bureau
  4. Asst. Director, Dock Safety
  5. APPCB
  6. The Commandant, Naval Office -in -charge
  7. The Commandant, Indian Coast Guard
  8. The Commandant, CISF

- The 9th Respondent is not storing the Ammonium Nitrate in port premises as per the Ammonium Nitrate Rules 2012.

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- The 9th Respondent have the International Standard of infrastructure to handle the Ammonium Nitrate and its safety measures.

- VPA was handled Ammonium Nitrate (Fertilizer grade) upto 05.01.2024 as per APPCB approval Lr No. 724/APPCB/HO/ECS/TF/VSP/2023 dated 12.08.2023. As per APPCB conditions VPA handled upto 05.01.2024 with all safety measures at the time of cargo handling at port.

- As per the APPCB instructions vide letter no. 724/APPCB/HO/ECS/TF/VSP/2024 dated 06.07.2024, VPA approached to Directorate General of Factory Advice Service and Labour Institutes (DGFASLI), Ministry of Labour & Employment, Government of India (GoI) to inspect and issue NOC for Ammonium Nitrate at Visakhapatnam Port.

- VPA received a letter from DGFASLI, GoI on 10.03.2025 and VPA requested to APPCB vide letter No. ITRA/SHP/AMN dated 18.03.2025 to permit for handling of Ammonium Nitrate at Visakhapatnam Port Authority.

41). If this Tribunal bans the import of Ammonium Nitrate, the following industries will be affected completely and it will affect the National economy:Fertilizer Industry, Food Industry, Medicine and Pharmaceutical, Construction and Mining.

42). With reference to the two explosions in Tianjin and Beirut, the above two reports clearly states that ammonium nitrate was illegally stored in the warehouse in Beirut more than six years in port premises and as far as Tianjin case, the initial fire outbreak was caused by nitrocellulose and it was the major reason for igniting the ammonium nitrate, and ammonium nitrate alone is not responsible for the explosion. Hence applicant relying on the above two accident explosions, for importing ammonium nitrate in India is not applicable to the present case.

43). As far as precautionary principle relied by the judgements not applicable to the present case, the Hon'ble Supreme Court in Kudankulam Nuclear Power Plant case and also Narmada BachaoAndolan Case has taken a view that sustainable development was considered. Similarly in this case, Ammonium Nitrate is playing a vital role in several industries and in development of the Indian Economy and in millions of employment in agriculture and other industries.

44). In conclusion, ammonium nitrate plays a pivotal role in India's economic growth, food security, and industrial development, serving as a critical input for agriculture and various industries. The existing stringent regulatory protocols effectively ensure that its import, storage, and handling pose minimal risk to human life and the environment. In light of these safeguards and the essential nature of this chemical for the nation's progress, it is respectfully submitted that the Hon'ble National Green Tribunal may dismiss the application filed by the Applicant as being unfounded and allow the continued import and handling of ammonium nitrate at Visakhapatnam Port in strict compliance with the prevailing regulations.

45). I further submit that against the 9thRespondent in the past 90 years of our service only one complaint was filed against the 9thRespondent and the same was compiled by the 9thRespondent as per the directions of the APPCB.

46). I submit that the 9th Respondent reserves their right to file their further additional Counter/ReplyAffidavit and documents at any time of during the pendency of the above case.

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It is therefore prayed that this Hon'ble Tribunal may be pleased to dismiss the Original Application and thereby render justice.

9th Respondent.
Executive Engineer
Civil Engineering Department
Visakhapatnam Port Authority

VERIFICATION

I, S. Balamurali, aged about 32 years having office at Civil Engineering Department, 3rd Floor, Administrative Office Building, Visakhapatnam Port Authority, Visakhapatnam the above named deponent, do hereby verify the contents of the forgoing reply affidavit are true and correct to my knowledge and no part of its false and no material has been concealed therefrom.

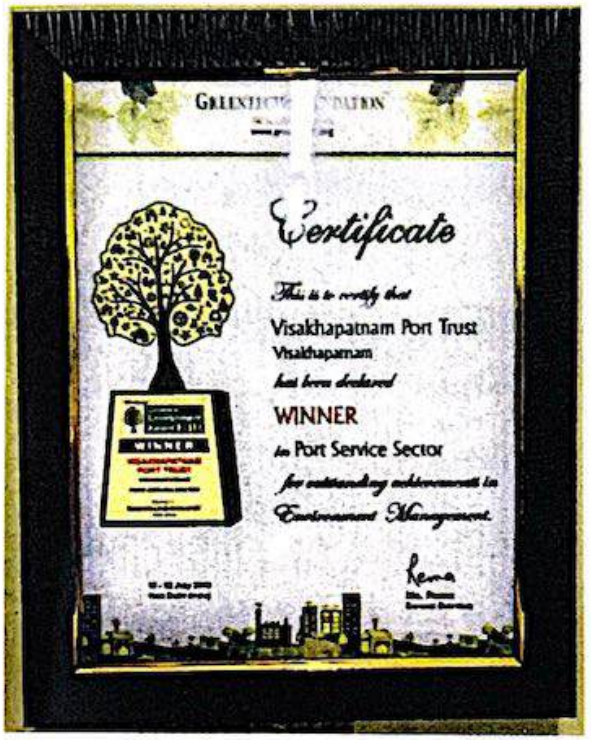
Verified at Vishakhapatnam on this day of 22nd day of March, 2025.

9th Respondent.
Executive Engineer
Civil Engineering Department
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ANNEXURE I

Green Tech Environment Awards Won by Visakhapatnam Port Authority

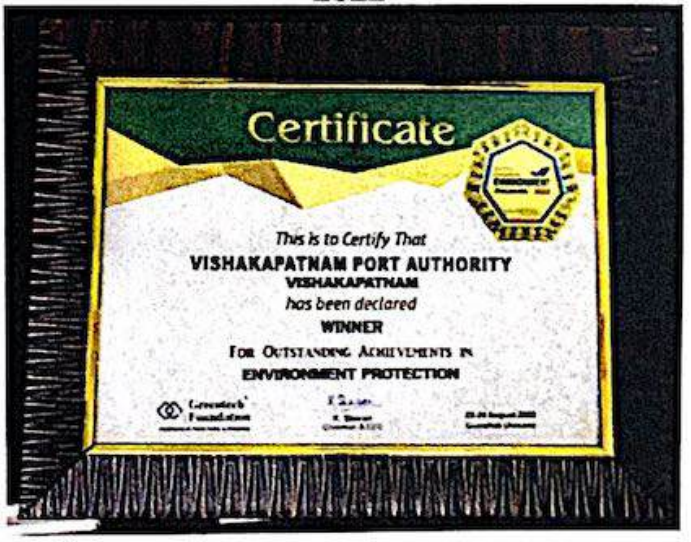
2019



2020



2022



मुख्य अभियंता
CHIEF ENGINEER
विशाखपत्तनम पोर्ट ट्रस्ट
Visakhapatnam Port Trust

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Reg No 13/5
P SRINIVASA RAO
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INDIA

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ADVOCATE & NOTARY
D No. 49-20-13, LALITHA NAGAR
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AI in Various Ports

ANNEXURE 2 23

Google which are ports are allowed to import ammoniur

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AI Overview

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The following ports in India are allowed to import ammonium nitrate:

- Paradip Port: Imports ammonium nitrate in bagged form or in containers stuffed with bags
- Karanja (Mumbai): Imports and exports explosives
- Tuticorin: Imports and exports explosives
- Cochin: Imports and exports explosives
- Chennai: Imports and exports explosives
- Visakhapatnam: Imports and exports explosives
- Diamond Harbour (Kolkata): Imports and exports explosives

The Ministry of Ports, Shipping and Waterways notifies ports that are allowed to import ammonium nitrate. The Petroleum & Explosive Safety Organisation (PESO) makes recommendations to the Ministry.

Ammonium nitrate is a white, crystalline chemical that is used in many applications, including fertilizers, anesthetic gases, and commercial explosives. It is classified as an oxidizing agent and is defined as an explosive in the Ammonium Nitrate Rules, 2012.

Generative AI is experimental. For legal advice, consult a professional.

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Standard Operating Procedure for handling of Ammonium ...

1. Scope:- Ministry of Ports, Shipping and Waterways vide Gazette Notification No. 3298 dated 21.10. 2020 has notifi

Paradip Port Trust

FAQs on Ammonium Nitrate | Petroleum & Explosi - PESO

Ans. Pure ammonium nitrate (NH4NO3) is a white, water-soluble, crystalline substance with a melting point of 170°C

PESO

Advisory on shipping of Dangerous Goods. - J.M & Co.

3. 4. GUIDELINES FOR EXPORTER/IMPORTER Shippin DG i.e. Explosives (Commercial/ Industrial) UN Class 1 an

J.M.Baxi & Co.

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தமிழ் இல் In English

Hence, Import of Ammonium Nitrate shall be allowed in bagged form or in containers stuffed with bags, in Paradip Port.

Paradip Port
https://paradipport.gov.in › SOP-PPA PDF

Standard Operating Procedure for handling of Ammonium ...

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Ammonium Nitrate are permissible from ports in India that have been notified by ...
Visakhapatnam, Diamond Harbour (Kolkata) ports are notified for Import/Export.

24

Petroleum and Explosives Safety Organization (PESO)
https://peso.gov.in › web › faqs-ammonium-nitrate

FAQs on Ammonium Nitrate | Petroleum & Explosive Safety ...

Authorized Ports For Import/Export · Testing Laboratories for Ex Equipments ... Import of Ammonium Nitrate is presently regulated under Ammonium Nitrate Rules, ...

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Ammonium Nitrate Rules 2012

(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 ...
91 pages

Directorate General of Trade Remedies
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MINISTRY OF COMMERCE & INDUSTRY ...

iii. **There is no restriction on imports of Ammonium Nitrate**. The product falls under Open General License (OGL) category. iv.
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Rules for Ammonium Nitrate

22 Sept 2021 — The rules require that **ammonium nitrate** received at **ports** be transferred to storage houses 500 metres beyond the **port** area. · The rules also ...

The Hindu BusinessLine
https://www.thehindubusinessline.com › ... › Logistics

Miners are the major users of ammonium nitrate imported ...

13 Aug 2020 — Unlike other cargo, the chemical can only be imported though ports such as **Visakhapatnam** that are approved and notified by the Shipping Ministry ...

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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**.
118 pages

National Academy of Customs, Indirect Taxes & Narcotics
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E-book No.03 on Ammonium Nitrate.pdf

18 Sept 2015 — 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 ...
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Handling of Ammonium Nitrate at VOCPT

Ammonium Nitrate as notified in the TNPCB only shall be handled in the **Port**. 2. Owner of the cargo is well within the stipulated conditions and.
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Ammonium Nitrate **Rules, 2012** Ammonium Nitrate **Rules, 2021**

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Is ammonium nitrate **banned** in India	ammonium nitrate **rules, 2012 pdf**
Top 10 Ammonium Nitrate **manufacturers** in India	**Is** ammonium nitrate **explosive**
Which are ports are allowed to import ammonium nitrate in india...	Ammonium Nitrate **Rules 2018**

1 2 3 4 5 6 7 8 9 10 Next

Vizag SOP
Annexure 2 & 3

VISAKHAPATNAM PORT AUTHORITY
TRAFFIC DEPARTMENT
***

No: ITRA/SHP/FAMN

Dt: 24 -01-2023.

26

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.

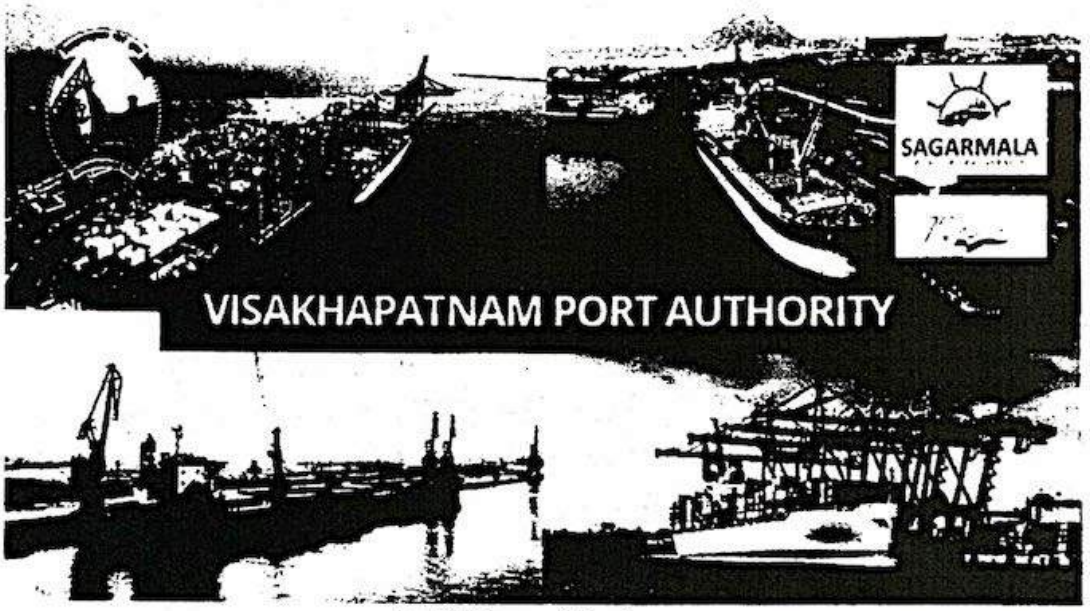
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for TRAFFIC MANAGER
24/1/2023

P.HALDAR
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
[illegible] और स्वास्थ्य भवन [illegible] एस.एम. मकोकर मार्ग, शीव, मुंबई - ४०० ०२२, भारत
[illegible] Swasthya Bhavan, S.S. Mankikar 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

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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.

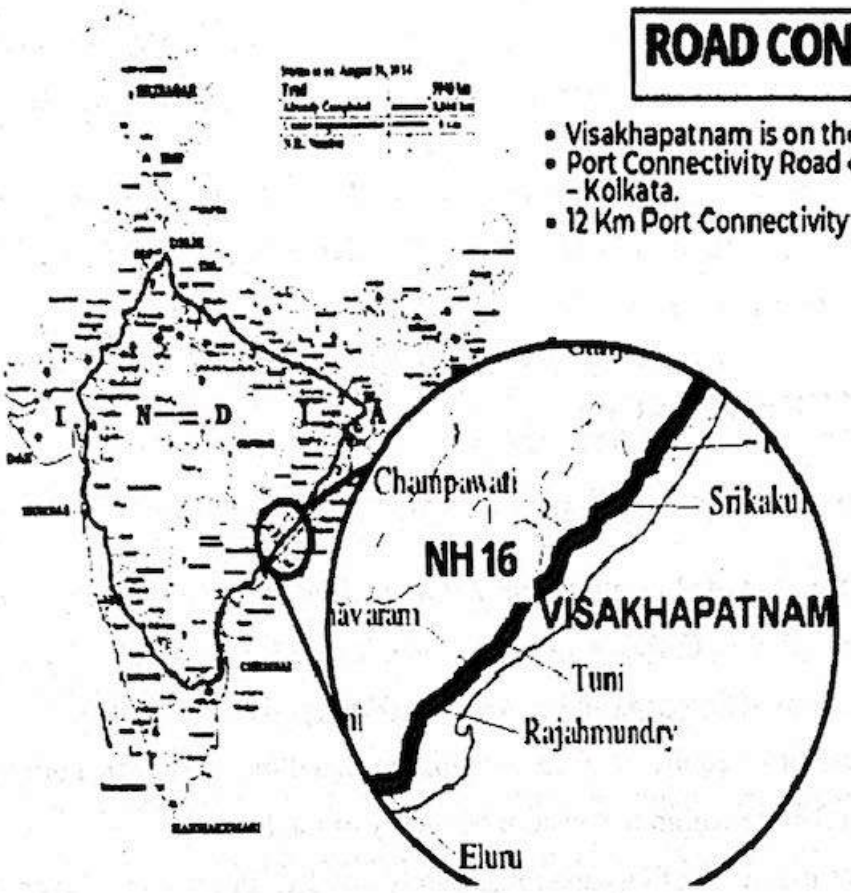
5. TERMS OF REFERENCES

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

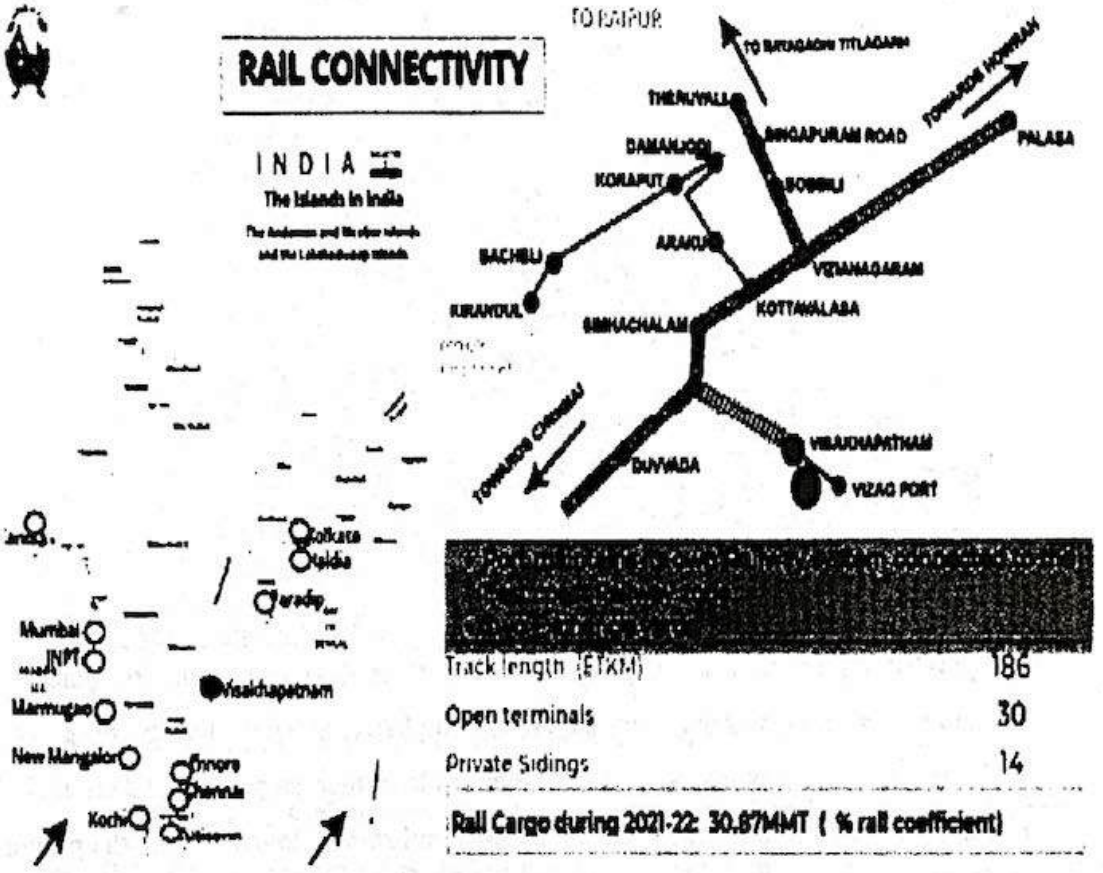
6. M/S VISAKHAPATNAM PORT AUTHORITY- AT A GLANCE

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

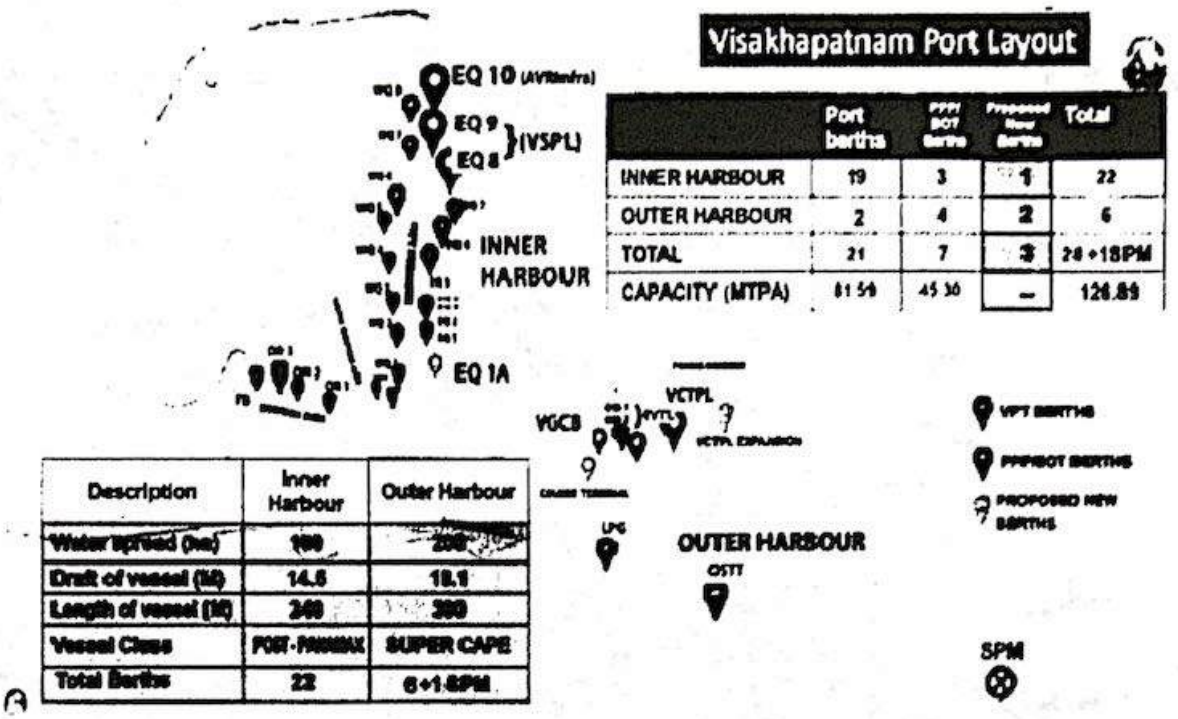
The Rail network at Port has two systems viz., Iron ore (Mechanical Tippling) and General (other than Iron ore Mechanical), for handling food grains, fertilizers, thermal coal, steel products, coking coal, Iron Ore(manual unloading) & other mineral ores, POL products etc.



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.

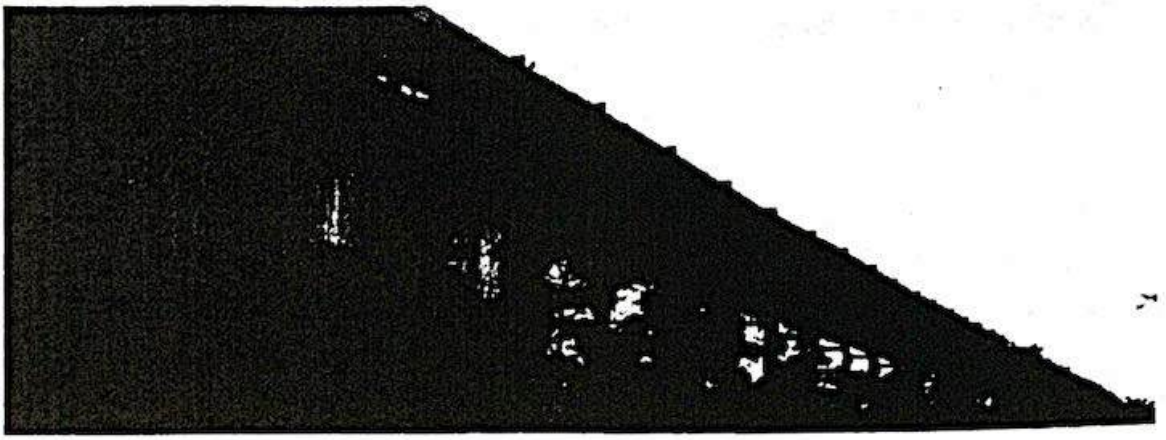
The Dolphin's Nose Hill to the north of the entrance channel protects the harbour from cyclones that strike the east coast.

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.

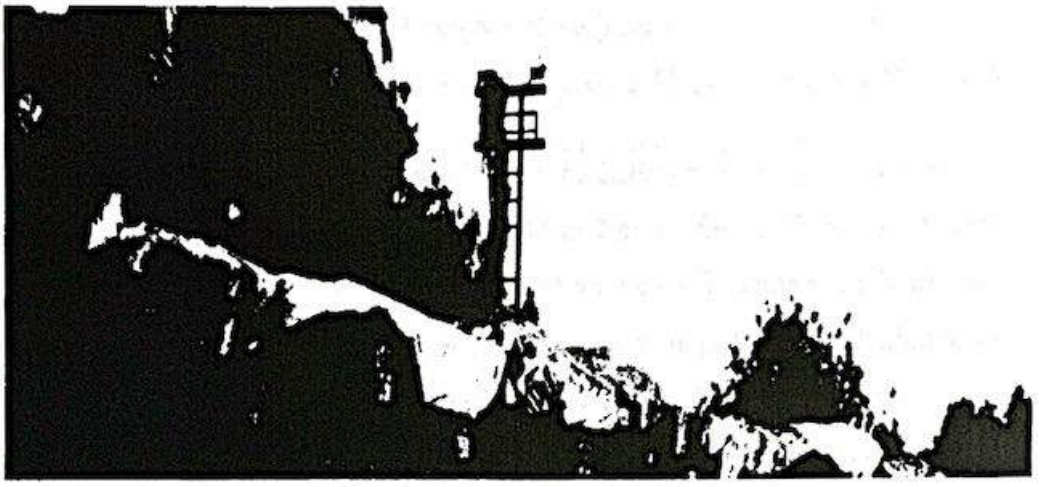


As part of its modernisation program, the port is also upgrading its general cargo, deepening its inner harbour entrance channel and strengthening five berths in the inner harbour to admit vessels with 12.5-meter draft. Other steps undertaken include the development of a truck parking terminal and a 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.

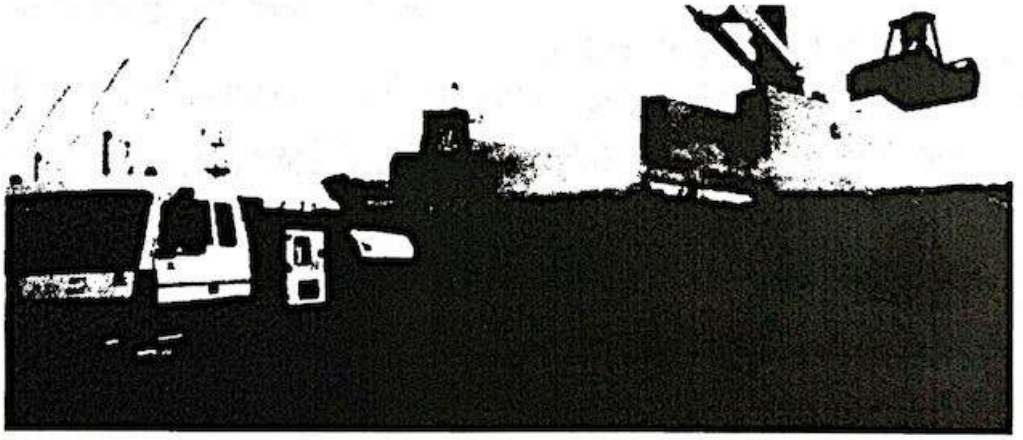


Sub-Committees are constituted to review and monitor AAQ (Ambient Air Quality), Green Belt Development and Hazard Management. The EMC reviews the findings of the Sub-Committees and advises suitably on the environmental improvement measures.



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

Ammonium Nitrate



Colorless crystals; odorless. Irritating to eyes/skin/respiratory tract. Also causes: difficulty breathing, acidic urine, systemic acidosis, and abnormal hemoglobin. Strong oxidizer capable of igniting combustible materials.

CAS No. 6484-52-2

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?	Rositive
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 include for 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 werethere in the factory during the last five years? Givedepartment / 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); 2) Availability of SCBA for firefighting operations and spare cylinders (at least 2 for each SCBA); 3) Adequacy of hose, nozzles, ladders, lighting equipment and pumps; and 4) Communication facility at fire station, walkie talkie sets during firefighting.	 1.YES 2.YES 3.YES 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 contalning 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. Ghosh

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

भारत का राजपत्र
The Gazette of India

असाधारण
EXTRAORDINARY
भाग II—खण्ड 3—उप-खण्ड (ii)
PART II—Section 3—Sub-section (ii)
प्राधिकार से प्रकाशित
PUBLISHED BY AUTHORITY

सं. 1677] नई दिल्ली, बुधवार, जुलाई 17, 2013/आषाढ़ 26, 1935
No. 1677] NEW DELHI, WEDNESDAY, JULY 17, 2013/ASADHA 26, 1935

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 प्रयोग करते हुए, केन्द्र सरकार लोक हित में अमोनियम नाइट्रेट के अंतरण की अनिवार्यता पर विचार करते हुए, एतद्द्वारा कोलकाता, विशाखापट्टनम, पी.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-पीए]

एन. मुरुगानन्दम, 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 Bulk by sea.

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

N. MURUGANANDAM, 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.

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.

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 limits M-Factor	REACH registration number
6484-52-2	229-347-8	Ammonium nitrate	≤ 95	Oxidising solid 3 H272 Eye Irritation 2 H319	≥ 50% — < 100% Eye Irritation 2 H319	01-2119490981-27-0018
10377-60-3	233-826-7	Magnesium nitrate	≤ 19	Oxidising solid 3 H272	–	01-2119491164-35-0003

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/cm³	–
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/100m^2 and 0.5-1.0kg/100m^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	
SU8: 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, pelletization* *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
Organizational measures to prevent/limit releases, dispersion and exposure	
Minimize number of staff exposed. Segregation of the emitting process. Effective contaminant extraction. Minimization 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, oxidizing) 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*

PROC3a: Transfer of substance or preparation (charging discharging) from to vessels large containers at non-dedicated facilities	
PROC3b: 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 / Ourdoor	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].	

Annexure 4 145

COCHIN PORT AUTHORITY

COCHIN-682 009, INDIA
Tele:91-0484-2666414/0484- 258 - 2400
Telefax:91-0484-2666414
E-mail: ce@cochinport.gov.in
Website: www.cochinport.gov.in

PROVIDING CONSULTANCY SERVICES FOR QUANTITATIVE RISK ANALYSIS ALONG WITH CLOSURE REPORT AND ENVIRONMENTAL IMPACT ASSESSMENT STUDY WORKS IN CONNECTION WITH HANDLING AMMONIUM NITRATE AT Q7 BERTH OF COCHIN PORT

BID DOCUMENT
(T12/1985/2023-C)

COCHIN PORT AUTHORITY
CHIEF ENGINEER'S OFFICE
COCHIN - 682009

Price : Rs.840/- (750 + 12% GST)

COCHIN PORT AUTHORITY

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PROVIDING CONSULTANCY SERVICES FOR QUANTITATIVE RISK ANALYSIS ALONG WITH CLOSURE REPORT AND ENVIRONMENTAL IMPACT ASSESSMENT STUDY WORKS IN CONNECTION WITH HANDLING AMMONIUM NITRATE AT Q7 BERTH OF COCHIN PORT.

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COCHIN PORT AUTHORITY

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Fax : 91 0484 2666414
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Website: www.cochinport.gov.in

Chief Engineer's Office,
Cochin – 682 009.

No.T12/T-1985 /2023-C

Dated:23-03-2023

TENDER NOTICE

1. Electronic Tenders (e-tenders) on lump sum basis in Single stage, Two Cover system (Technical Bid & Price Bid) are invited for **"Providing consultancy services for Quantitative Risk Analysis along with closure report and Environmental Impact Assessment study works in connection with handling Ammonium Nitrate at Q7 berth of Cochin Port"**, from the accredited EIA consultants of MoEF&CC/ National Accreditation Board for Education and Training (NABET) under sector/category of Ports, harbor, jetties, marine terminals, break waters and dredging.

2. Details of downloading/ submission of Bids are as under:

Download period	From 23-03-2023 to 15.00 hours on 03-04-2023
Last date and time of submission of bid	15.00 hours on 03-04-2023
Date and time of opening the bid	15.30 hours on 03-04-2023
Earnest Money Deposit	**Rs.25,000/-** shall be furnished either through Demand Draft / Pay Order / Banker's Cheque drawn in favour of Financial Adviser & Chief Accounts Officer, COCHIN PORT AUTHORITY (CoPA), payable at Kochi, from any Nationalised Bank/ Scheduled Bank operating in India.
Cost of Bid document	**Rs.840 (Rs.750 + 12% GST)** (Non refundable) furnished through Demand Draft / Pay Order / Banker's Cheque drawn in favour of the FA & CAO, CoPA, payable at Kochi, from any Nationalised Bank/ Scheduled Bank in India being the cost of single copy of the Tender Document.

3. Cochin Port Authority (CoPA) proposes to handle import of Ammonium Nitrate at Q7 berth of Ernakulam wharf at W/Island. In terms of Ammonium Nitrate Rules 2012, Port is required to be notified by Ministry of Ports, Shipping Waterways (MoPS&W) for facilitating handling this cargo. In this regard Port has been directed to obtain 'No Objection Certificate' from the Petroleum and Explosives Safety Organisation (PESO) and CoPA has to furnish Quantitative Risk Analysis along with closure report and Environmental Impact Assessment study including Disaster Management plan to PESO for the same.
4. Towards this requirement, CoPA proposes to avail the services of an Accredited EIA Consultant of MoEF&CC/ National Accreditation Board for Education and Training (NABET) under sector/category of Ports, harbor, jetties, marine terminals, break waters and dredging for carrying out Quantitative Risk Analysis along with closure report and Environment Impact Assessment (EIA) study works covering the required EIA studies, Disaster Management Plan (DMP) & Risk Assessment (RA), Environmental Management Plan (EMP) etc., and submitting reports as per the latest guidelines/ circulars/ notifications of MoEF&CC, Government of India. The reports shall meet all the requirements of PESO for handling Ammonium Nitrate at the proposed berth of Cochin Port.
5. Tender Documents can be downloaded from the e-Tendering portal ***www.tenderwizard.com/COPT*** on the dates specified in the above table by making online requisition. Bid document will also be available in Cochin Port website (***www.cochinport.gov.in***) as well as Central Public Procurement (CPP) Portal which can be downloaded for submission. The cost of Bid document shall be furnished in the form of Demand Draft/ Pay Order/Banker's Cheque drawn in favour of FA & CAO, CoPA along with the submission of Bid.
6. The Bidders need to obtain the one time User ID & password for log-in to **e-Tendering** system from the service provider M/s. **KEONICS** by paying registration amount of **Rs.1124/-** by online payment using Credit/Debit Card/Net banking or DD in favour of "KSEDCL, Bangalore".
7. The intending Bidder must have valid Class-II or III digital signature certificate to submit the Bid. For further details and to obtain the digital signature please contact e-Tender Help Desk No.080-49352000 / 9605557738.
8. Tenders shall be submitted **"online"** strictly in accordance with the Instructions to Bidders and Terms & Conditions given in the Tender Document.
9. The Bidder is responsible to download Addenda/ Amendments/ Errata/ Replies to the Queries of Bidders etc., if any, issued by CoPA, from the website before submission of the Bid. **Bids with any shortfall in submissions of the said Addenda/ Amendments/Errata/Replies to the queries of Bidder**

etc. duly signed along with the downloaded documents while submitting the Bid, will not be considered. Incomplete Bid documents may be rejected.

10. All Bids are to be submitted **online only** on the website **www.tenderwizard.com/COPT**. No Bids shall be accepted off-line (Hard copy).

11. COCHIN PORT AUTHORITY will not be held responsible for any technical snag or network failure during online bidding. It is the Bidders' responsibility to comply with the system requirements i.e. hardware, software and internet connectivity at Bidder's premises to access the e-Tender portal. Under any circumstances, COCHIN PORT AUTHORITY shall not be liable to the Bidders for any direct/indirect loss or damages incurred by them, arising out of incorrect use of the e-Tender system or internet connectivity failures.

12. The complete Tender Document shall be submitted online as tender offer on or before the due date and time of submission. The scanned copy of financial instruments towards cost of Tender Document and EMD / Bid Security shall be uploaded with the Tender Document while submitting the tender electronically in the e-procurement Portal. The Bidder shall submit the originals of: (i) DD/ Pay Order/ Banker's Cheque towards the cost of Tender Document and EMD, (ii) Power of Attorney, if applicable, **along with letter of submission** in a sealed cover duly mentioning the Tender No. & Name of Assignment, due date of opening of Bid and Name of the Bidder to the **Chief Engineer, COCHIN PORT AUTHORITY, W/Island, Cochin – 682009, KERALA**, upto***15.00 hrs. on 04-04-2023***. **Non submission of the original financial instruments towards the Cost of Tender Document and EMD within the above period leads to disqualification of Bids.** Bids received after the stipulated last date and time for receipt, due to any reasons will not be considered.

13. MSME Bidders who are registered with District Industries Centre (DIC) or Khadi and Village Industries Commission (KVIC) or Khadi and Village Industries Board (KVIB) or Coir Board or National Small Industries Corporation (NSIC) or directorate of Handicrafts and Handlooms or Udyog Aadhaar Memorandum or any other body specified by Ministry of MSME for similar nature of Works shall be eligible for issue of Bid Document free of cost and exemption from payment of Earnest Money Deposit. They are required to submit documentary proof of such registration along with the offer, as detailed in Instructions to Bidders, for claiming the available exemptions and a scanned copy of Exemption Certificate duly notarized shall be uploaded in the e – Tender Portal. If the Registration Certificate does not pertain to the Category of 'Similar Works' mentioned above, the Tender will be rejected.

14. The undersigned reserves the right to reject/cancel/postpone any one or all tenders at any stage of the tender, which will be binding on all Bidders.

CHIEF ENGINEER
COCHIN PORT AUTHORITY
TeleFax : 91 0484 2666414
Email :ce@cochinport.gov.in
: coptce@gmail.com

SECTION-I

INVITATION FOR PROPOSAL

1. INVITATION FOR PROPOSAL

1.1 Background

Cochin Port Authority (CoPA) proposes to handle import of Ammonium Nitrate at Q7 berth of Ernakulam wharf at W/Island. In terms of Ammonium Nitrate Rules 2012, Port is required to be notified by Ministry of Ports, Shipping Waterways (MoPS&W) for facilitating handling this cargo. In this regard Port has been directed to obtain 'No Objection Certificate' from the Petroleum and Explosives Safety Organisation (PESO) and CoPA has to furnish Quantitative Risk Analysis along with closure report and Environmental Impact Assessment study including Disaster Management plan to PESO for the same.

Towards this requirement, CoPA proposes to avail the services of an Accredited EIA Consultant of MoEF&CC/ National Accreditation Board for Education and Training (NABET) under sector/category of "Ports, harbor, jetties, marine terminals, break waters and dredging" for carrying out Quantitative Risk Analysis along with closure report and Environment Impact Assessment (EIA) study works covering the required EIA studies, Disaster Management Plan (DMP) & Risk Assessment (RA), Environmental Management Plan (EMP) etc., and submitting reports as per the latest guidelines/ circulars/ notifications of MoEF&CC, Government of India. **The study/reports shall meet all the requirements of PESO for handling Ammonium Nitrate at the proposed berth of Cochin Port.**

The Scope of Work/Assignment and duties of the consultant shall be as detailed in **Appendix-I *Terms of Reference* (ToR).**

1.2 Request for Proposal / Bid:

Cochin Port invites Bids for selection of an Accredited EIA Consultant of MoEF&CC/ National Accreditation Board for Education and Training (NABET) under sector/category of 'Ports, harbor, jetties, marine terminals, break waters and dredging' for **"Providing consultancy services for Quantitative Risk Analysis along with closure report and Environmental Impact Assessment study works in connection with handling Ammonium Nitrate at Q7 berth of Cochin Port"** who shall prepare the Quantitative Risk Analysis along with closure report and Environmental Impact Assessment study report, covering the Scope of work/ Assignment as per ToR, and as per the latest guidelines/ circulars/ notifications of MoEF&CC, for submission to PESO for approval in connection with handling import of Ammonium Nitrate at Q7 berth of Cochin Port. They shall also assist Cochin Port for obtaining NoC from Petroleum and Explosives Safety Organisation (PESO) for the subject project.

CoPA intends to select the Consultant through competitive bidding from accredited EIA Consultant of MoEF&CC/ National Accreditation Board for Education and Training (NABET), under sector/category of 'Ports, harbor, jetties, marine terminals, break waters and dredging' in accordance with the procedure set out herein.

OUTSOURCING / SUBCONTRACTING IS NOT PERMITTED FOR THIS ASSIGNMENT.

1.3 Due Diligence by the Bidders

Bidders are encouraged to inform themselves fully about the Assignment and the local conditions before submitting the Bid by making a visit to the Project Site, sending written queries to the Authority etc.

1.4 Cost of Tender Document

The Cost of Tender Document shall be remitted in the form of Demand Draft /Pay Order/Banker's Cheque drawn in favour of the FA & CAO, CoPA from any Scheduled / Nationalised Bank having its branch at Kochi **at the time of submission of Bids** and scanned copy of the same shall be attached with the e-tender.

1.5 Validity of the Proposal / Bid

1.5.1 The Proposals /Bids shall be valid for a period of at least **120** (One hundred and twenty) days from the Proposal Due Date (PDD). The CoPA reserves the right to reject any Proposal, which does not meet this requirement.

1.5.2 In exceptional circumstances, prior to expiry of the above Proposal Validity Period, CoPA may, by a request in writing, require the Bidders to extend the period of validity for specified additional periods. Bidders who are willing for such an extension shall have to communicate their acceptance, within the specified time as mentioned in the request made by the Port Trust for validity extension. A Bidder may also refuse the request without forfeiting its Earnest Money Deposit. However, no claim from such bidders, whatsoever, concerned with this bidding, will be entertained by the Port Trust. A Bidder agreeing to the request will not be allowed to modify its Proposal.

1.6 Brief Description of the Selection Process

The Financial Quote of only those bidders who meet the tender requirements relating to EMD, Cost of Tender Document and found responsive in the evaluation of Technical Bid, shall be opened later.

Contract will be awarded to the bidder whose bid has been determined to be responsive and who has offered the lowest lumpsum consultancy fee for the assignment

1.7 Schedule of Selection Process

The Port would endeavor to adhere to the following schedule:

1. Last date for receiving queries/clarifications :23-03-2023
2. Proposal/ Bid Due Date or PDD :03-04-2023
3. Opening of the Bid :03-04-2023
4. Validity of Bids :120 days

1.8 Pre-Proposal visit to the Site and inspection of data

Prospective bidders may visit the Site and review the available data at any time prior to PDD. For this purpose, they will provide at least two days' notice to the nodal officer specified below:

The Suptdg. Engineer (Tech),
Chief Engineer's Office,
COCHIN PORT AUTHORITY

1.9 Pre-Bid Meeting : NIL

Any Addenda/ Amendments/ Errata/ Replies to the queries of Bidder etc., if any, issued by CoPA will be hosted in websites only and the Bidder shall be responsible to check and download those documents, if any, issued by CoPA, from the website before submission of Bid. In order to afford Bidders with reasonable time to take an Addendum into account, or for any other reason, the CoPA may, at its discretion, extend the Proposal Due Date and the bid extension notice shall be hosted in our website.

1.10 Communications

1.10.1 All communications including the submission of Proposal should be addressed to :

The Chief Engineer,
COCHIN PORT AUTHORITY,
Willingdon Island,
Cochin – 682 009.
Kerala, India.

1.10.2 The official website of the Authority is **http://www.cochinport.gov.in**

1.10.3 All communications, including the envelopes, should contain the following information, to be marked at the top in bold letters

Tender No. .....
Tender Name.....

SIGNATURE OF THE BIDDER

SECTION-2

SITE INFORMATION

2. SITE INFORMATION

2.1 INFORMATION ON COCHIN PORT

The Cochin Port, one among the thirteen Major Ports of India, is the fastest growing maritime gateway to the peninsular India. This all weather natural port is strategically located close to the trunk sea routes from Europe to Australia and to Far East. The diversion distance to Cochin from this trunk route is only 76 nautical miles. There is only 11 nautical miles diversion from the Singapore - Gulf sea route to Cochin. No other Indian major port enjoys this proximity to maritime highways.

Cochin Port is located on the South West Coast of India in the state of Kerala at latitude 9° 58' N and longitude 76° 16' E. The existing harbour basin is within the naturally protected area of Cochin lagoon. The entrance of the Port is through the Cochin Gut between the peninsular headland of Vypeen and Fort Cochin. The approach channel to the Port up to the Cochin Gut is about 13 km long having a width of 260m for a length of 11km and 286m for the remaining length. Dredged depth varies from (–) 15.95m at Gut to (-) 17.4m at outer channel, maintained throughout the year. Main facilities of the Port are located on the artificially created Willingdon Island.

Cochin Port, India's first e-Port is an ISO: 9001-2008 certified port complying with all ISPS and MARPOL regulations offering round the clock navigation throughout the year.

The Port is well connected with Railway & National Highway network, which gives easy access to the other parts of the country. The Cochin International Airport is situated about 40 km away from the Port.

2.2 EXISTING PORT FACILITIES

2.2.1 The existing Port facilities are located mainly on W/Island, having an area of about 385 hectares. The Island divides the navigational channel into the Ernakulam channel and the Mattancherry channel, inside the harbour. In addition to the above, an area of about 180 hectares at Vallarpadam and 286 hectares at Puthuvypeen falls under the jurisdiction of Cochin Port, where various developmental activities are now in progress.

2.2.2 There are two wharves on W/Island, viz., Mattancherry Wharf and Ernakulam Wharf. The Mattancherry Wharf is 670 m long with four along side berths and the Ernakulam Wharf is 917m long with five along side berths. There are three oil berths, viz., Cochin Oil Terminal (COT), North Tanker Berth (NTB) and South Tanker Berth (STB) which can accommodate 1,15,000 DWT, 30,000 DWT and 18,000 DWT vessels respectively. Other berthing facilities comprise of a Fertilizer Berth, which can accommodate vessels of 60,000 DWT, one Boat Train Pier, which can accommodate 35,000 DWT vessels and two jetty berths for miscellaneous cargo with capacity for vessels upto 12,000 DWT and 35,000 DWT.

2.2.3 The existing facilities include the following:

- 16 Berths including 3 oil jetties
- Round the clock pilotage
- Dedicated facilities to handle bulk/break bulk as well as a variety of liquid cargo.
- Storage spaces
- Single Buoy Mooring (SBM) for crude handling.
- Port Based Special Economic Zones (PBSEZs)

  Govt. of India has notified an area of 285.8413 ha. at Puthuvypeen and 110.4465 ha at Vallarpadam as Port Based Special Economic Zones. The installations at Puthuvypeen SEZ include Shore Tank farms of BPCL-KR, LNG Regasification Terminal by M/s Petronet LNG Ltd. (PLL) and LPG Import Terminal & Multi User Liquid Terminal being implemented by IOCL. International Container Transhipment Terminal by M/s India Gateway Terminal Private Ltd, a subsidiary of DP World is operational at Vallarpadam SEZ.

2.3 Project Location

The project is located inside the Ernakulam Wharf at Q7 berth area of Cochin Port. The Location Plan is given as under.



2.4 Oceanographic Data

2.4.1 Tides

Cochin experiences semi diurnal tides. The tidal levels as per Naval Hydrographic Chart No.2004 are as follows:

Highest High Water Level	:	+1.20m
Mean High Water Spring (MHWS)	:	+0.92m
Mean Low Water Spring (MLWS)	:	+0.80m
Mean Sea Level (MSL)	:	+0.582m
Mean High Water Neap (MHWN)	:	+0.60m
Mean Low Water Neap (MLWN)	:	+0.30m
Lowest Low Water Level	:	+0.20m

2.4.2 Waves

The wave climate in the sea is governed by the South West monsoon when wave action can be strong with prevailing wave directions from north-west to south-west. Deep water (15m) wave observations in the past indicate the significant wave heights of 4m, 2m and 1m at the water depths of 10m, 5m and 2m respectively, the predominant wave direction being west.

Wave action inside the harbour is insignificant because of narrow entrance between Cochin Gut and Fort Cochin and the configuration of the land. Generally calm conditions prevail throughout the year except during the times of extreme wind action.

2.4.3 Current

The currents along the coast of Cochin consist of tide, Wave and Wind induced components. As per observations the maximum current velocities at the Cochin Gut during the non-monsoon periods is of the order of 3 knots, which could increase to as high as 5.5 knots during the monsoon periods. Inside the harbour the current velocities relatively are low, of the order of 0.5 knots only, with directions varying at different locations. Maximum flood velocities during the monsoon were observed at the bottom due to density currents.

2.4.4 Littoral Drift

The Littoral Drift influenced by the monsoon is southwards during south–west monsoon period and northwards during non–monsoon period. Though this contributes to the siltation in the approach channel, it has no direct impact in the inner Channels.

2.4.5 **Bathymetry**

The seabed slopes gently in the offshore region and is about 1 in 500-600. The coast experiences the littoral drift, as anywhere else but there is a phenomenon of formation of the mud banks. The mud banks are not stationary and have a tendency to move in the coastal region.

2.5 Climatology and Meteorology

2.5.1 Temperature and Humidity

Temperature at Cochin varies from about 23° to 32.5°C. There are not much distinct seasonal variations in the temperature, which is more or less uniform throughout the year. However, highest temperature tends to occur in the months of March to May. Low temperatures occur during December and January.

The Humidity is high throughout the year. From June to September, during monsoon, the humidity ranges from 95% to 100%. From October to January it comes down to 50% to 70%. During the summer months of February to May average humidity is about 60%.

2.5.2 Winds and Cyclones

The wind speed and wind direction is determined by the season and by the daily temperature differences between land and sea. The predominant wind direction during the monsoon period i.e. from June to September is west to south-west and the effect of land breeze is not dominant during this period.

During the non-monsoon periods, the predominant wind direction is from north-east during the morning and west during the evening, which shows influence of land breeze.

The maximum wind speed observed was of the order of 112 kmph from WSW direction.

Cochin lies beyond the cyclone belt and therefore the risk of cyclones is negligible.

2.5.3 Rainfall

The maximum rainfall usually occurs during the SW monsoon period i.e. from June to September. The annual rainfall in the region varies between 2500 to 3500 mm.

SIGNATURE OF THE BIDDER

SECTION - 3

INSTRUCTION TO BIDDERS

3. INSTRUCTIONS TO BIDDERS

A. GENERAL

3.1 Scope of the Proposal

3.1.1 Detailed description of the objectives, scope of services, deliverables and other requirements relating to this Consultancy are specified in this document. Bids for providing the required services are invited from the accredited EIA consultants of MoEF&CC/ National Accreditation Board for Education and Training (NABET) under sector/category of 'Ports, harbor, jetties, marine terminals, break waters and dredging'. In case a Bidder/firm possesses the requisite experience and capabilities required for undertaking the Consultancy, it may participate in the Selection Process in response to this invitation. The manner in which the Proposal is required to be submitted, evaluated and accepted is explained in this document.

Bidders are advised that the selection of Consultant shall be on the basis of an evaluation by the Port through the Selection Process specified in this bid document. Bidders shall be deemed to have understood and agreed that no explanation or justification for any aspect of the Selection Process will be given and that the Port's decisions are without any right of appeal whatsoever.

The bidder shall submit its Proposal / Bid in the form and manner specified in this Bid Document/RFP. The proposal shall be submitted in the form at ***Appendix-II*** and the Financial Quote shall be submitted in the form at ***Appendix-XIV***. Upon selection, the Bidder shall be required to enter into an agreement with the Authority in the form specified at ***Appendix-XI***.

3.2 Conflict of Interest

3.2.1 The Consultant shall not have a Conflict of Interest and any breach hereof shall constitute a breach of the Agreement.

3.2.2 Consultant and Affiliates not to be otherwise interested in the Project.

The Consultant agrees that, during the term of this Agreement and after its termination, the Consultant or any Associate thereof and any entity affiliated with the Consultant, shall be disqualified from providing goods, works, services, loans or equity for any project resulting from or closely related to the Services and any breach of this obligation shall amount to a Conflict of Interest; provided that the restriction herein shall not apply after a period of five years from the completion of this Assignment or to consulting assignments granted by banks/ lenders at any time; provided further that this restriction shall not apply to consultancy/ advisory services provided to the Authority in continuation of this Consultancy or to any subsequent consultancy/ advisory services provided to the Authority in accordance with the rules of the Authority. For the

avoidance of doubt, an entity affiliated with the Consultant shall include a partner in the Consultant's firm or a person who holds more than 5% (five per cent) of the subscribed and paid up share capital of the Consultant, as the case may be, and any Associate thereof.

3.2.3 Prohibition of conflicting activities

Neither the Consultant nor any Associate thereof/any entity affiliated with the Consultant nor their Personnel shall engage, either directly or indirectly, in any of the following activities:

(i) during the term of this Agreement, any business or professional activities which would conflict with the activities assigned to them under this Agreement;

(ii) after the termination of this Agreement, such other activities as may be specified in the Agreement; or

(iii) at any time, such other activities as have been specified in the Bid as Conflict of Interest.

3.2.4 Guidance Note on Conflict of Interest is given below.

1) This Note further explains and illustrates the provisions of **Clause 3.2** of the Bid document and shall be read together therewith, in dealing with specific cases.

2) Consultants should be deemed to be in a Conflict of Interest situation if it can be reasonably concluded that their position in a business or their personal interest could improperly influence their judgment in the exercise of their duties. The process for selection of Consultants should avoid both actual and perceived Conflict of Interest.

3) Conflict of Interest may arise between the Authority and a Consultant or between Consultants and present or future Concessionaries/ Contractors. Some of the situations that would involve Conflict of Interest are identified below:

a) Authority and Consultants

i) Potential Consultant should not be privy to information from the Authority which is not available to others; or

ii) Potential Consultant should not have defined the Project when earlier working for the Authority; or

iii) Potential Consultant should not have recently worked for the Authority overseeing the Project.

b) Consultants and Concessionaires/Contractors:

i) No Consultant should have an ownership interest or a continuing business interest or an on-going relationship with a potential Concessionaire/contractor save and except relationships restricted to project-specific and short-term assignments; or

ii) no Consultant should be involved in owning or operating entities resulting from the Project; or

iii) no Consultant should bid for works arising from the Project.

The participation of companies that may be involved as investors or consumers and officials of the Authority who have current or recent connections to the companies involved, therefore, needs to be avoided.

4) The normal way to identify Conflicts of Interest is through self-declaration by Consultants. Where a conflict exists, which has not been declared, competing companies are likely to bring this to the notice of the Authority. All conflicts must be declared as and when the Consultants become aware of them.

5) Another approach towards avoiding a Conflict of Interest is through the use of "Chinese walls" to avoid the flow of commercially sensitive information from one part of the Consultant's company to another. This could help overcome the problem of availability of limited numbers of experts for the project. However, in reality effective operation of "Chinese walls" may be a difficult proposition. As a general rule, larger companies will be more capable of adopting Chinese walls approach than smaller companies. Although, "Chinese walls" have been relatively common for many years, they are an increasingly discredited means of avoiding Conflicts of Interest and should be considered with caution. As a rule, "Chinese walls" should be considered as unacceptable and may be accepted only in exceptional cases upon full disclosure by a Consultant coupled with provision of safeguards to the satisfaction of the Authority.

6) Another way to avoid Conflicts of Interest is through the appropriate grouping of tasks. For example, conflicts may arise if Consultants drawing up the terms of reference or the proposed documentation are also eligible for the consequent assignment or project.

7) Another form of Conflict of Interest called "scope–creep" arises when Consultants advocate either an unnecessary broadening of the terms of reference or make recommendations which are not in the best interests of the Authority but which will generate further work for the Consultants. Some forms of contractual arrangements are more likely to lead to scope-creep. For example, lump-sum contracts provide fewer incentives for this, while time and material contracts provide built in incentives for Consultants to extend the length of their assignment.

8) Every project contains potential Conflicts of Interest. Consultants should not only avoid any Conflict of Interest, they should report any present/ potential Conflict of Interest to the Authority at the

earliest. Officials of the Authority involved in development of a project shall be responsible for identifying and resolving any Conflicts of Interest. It should be ensured that safeguards are in place to preserve fair and open competition and measures should be taken to eliminate any Conflict of Interest arising at any stage in the process.

3.3 The Bidder

Only the accredited EIA consultants of MoEF&CC/ National Accreditation Board for Education and Training (NABET) under sector/category of 'Ports, harbor, jetties, marine terminals, break waters and dredging' shall be eligible to submit their Bids. The Bidder shall be registered under GST and shall furnish documentary evidence in support of valid GST registration.

3.4 Number of Proposals

No bidder shall submit more than one bid for the Consultancy. The Bidder applying individually or as partnership firm or limited company shall not be entitled to submit another application either individually or as a member of any partnership or subsidiary firm/company as the case may be.

3.5 Cost of the Proposal

The Consultant shall be responsible for all of the costs associated with the preparation of its Proposal and its participation in the bidding process, including subsequent negotiations, site visits etc. CoPA will not be responsible or in any way liable for such costs, regardless of the conduct or outcome of the bidding process

3.6 Site Visit

The Bidder is advised to visit and inspect the Project site and obtain for himself on his own responsibility all information that may be necessary for preparing the proposal and entering into a contract, in case of being successful. The site visit shall be at the Consultant's own expense. Permission, if required, to visit the Port/Project Site will be given on application to:

The Chief Engineer,
COCHIN PORT AUTHORITY,
Cochin – 682 009
Kerala, India.
Tel : 91-0484-2666414, 2666871 Extn:2400
Fax : 91-0484-2666414
E-mail: ce@cochinport.gov.in

3.7 Acknowledgement by Bidder

3.7.1 It shall be deemed that by submitting the Bid, the Bidder has:

a) Made a complete and careful examination of the bid document;
b) Received all relevant information requested from the Authority;

c) acknowledged and accepted the risk of inadequacy, error or mistake in the information provided in the Bid document or furnished by or on behalf of the Authority or relating to any of the matters referred to in **Clause 3.6** above;

d) satisfied itself about all matters, things and information, including matters referred to in **Clause 3.6** herein above, necessary and required for submitting an informed Application and performance of all of its obligations there under;

e) acknowledged that it does not have a Conflict of Interest; and

f) agreed to be bound by the undertaking provided by it under and in terms hereof.

3.7.2 The Authority shall not be liable for any omission, mistake or error on the part of the Bidder in respect of any of the above or on account of any matter or thing arising out of or concerning or relating to Bid document or the Selection Process, including any error or mistake therein or in any information or data given by the Authority.

3.8 Right to Reject Any or All Proposals

3.8.1 Notwithstanding anything contained in this Bid document, the CoPA reserves the right to accept or reject any Proposal and to annul the Selection Process and reject all Proposals, at any time without any liability or any obligation for such acceptance, rejection or annulment and without assigning any reasons thereof.

3.8.2 CoPA reserves the right to invite revised proposals from Bidders with or without amendment of the Document at any stage, without liability or any obligation for such invitation and without assigning any reason.

3.8.3 Without prejudice to the generality of **Clause 3.8.1**, the CoPA reserves the right to reject any Proposal if:

a) at any time, a material misrepresentation is made or discovered, or

b) the Bidder does not provide, within the time specified by the Authority, the supplemental information sought by the Authority for evaluation of the proposal.

Misrepresentation/ improper response by the Bidder may lead to the disqualification of the Bidder. If such disqualification / rejection occurs after the Proposals have been opened and the highest ranking Applicant gets disqualified /rejected, then the Authority reserves the right to consider the next best Bidder, or take any other measure as may be deemed fit in the sole discretion of the Authority, including annulment of the Selection Process.

B. DOCUMENTS

3.9 Contents of Bid document

The Bid document comprises of the Contents as mentioned in this document and would additionally include any Addenda/Amendments, if any, issued in accordance with **Clause 3.11.**

3.10 Clarifications

3.10.1 The Bidders who need clarifications on any specific issue shall inform the Employer in writing latest by before **28-03-2023** at the address given in the **Clause 1.10.** No queries/clarifications on Bid document shall be entertained after this date.

3.10.2 The Authority shall endeavor to respond to the queries within the period specified therein but not later than 3 (Three) days prior to the Proposal Due Date. The responses will be sent by fax or e-mail. The Authority will post the reply to all such queries on the Official Website and copies thereof will also be circulated to all Applicants who have purchased the Bid document without identifying the source of queries.

3.10.3 The Authority reserves the right not to respond to any questions or provide any clarifications, in its sole discretion, and nothing in this **Clause 3.10** shall be construed as obligating the Authority to respond to any question or to provide any clarification.

3.11 Amendment to Bid document

3.11.1 At any time prior to the due date for submission of the Bid, the Chief Engineer may for any reason, whether at his own initiative or in response to clarifications requested by a prospective Bidder, modify the Bid documents by issuance of addendum. Any addendum/amendment thus issued will be sent in writing/ email to all the Bidders who have purchased/downloaded the Bid documents from the web sites and will be binding up on them. In order to afford the Bidders with reasonable time to take addendum into account, or for any other reason, the Port Authority may, at its discretion, extend the due date for submission of Bid and bid extension notice shall be hosted in the web sites only.

3.11.2 The Chief Engineer, COCHIN PORT AUTHORITY shall have the right to omit or suspend certain items of work or revise or amend the Bid documents prior to the due date of submission of the Bid. Such revisions or amendments or extensions if any, shall be communicated to all the Bidders who have down loaded/purchased the Bid documents, in the form of an addendum by telefax/ e-mail/ writing. In order to afford the Bidders with reasonable time to take addendum into account, or for any other reason, the Port Trust may, as its discretion, extend the due date for submission of Bid and the bid extension notice shall be hosted in our website www.cochinport.gov.in or www.tenders.gov.in.

3.11.3 If there are varying or conflicting provisions made in any document forming part of the contract, the Chief Engineer, COCHIN PORT AUTHORITY, Cochin -682009 shall be the deciding authority with regard to the intention of the document which will be binding on the Bidder/Consultant.

C. PREPARATION, SUBMISSION AND EVALAUATION OF THE PROPOSAL

3.12 Language of the Bid

The Bid submitted by the Bidder and all correspondence and documents relating to the Bid exchanged by the Bidder and the Employer shall be written in **ENGLISH LANGUAGE.** Any printed literature, other than in English language, shall be accompanied by an English translation, in which case for purpose of interpretation of the Bid, the English translation shall govern.

3.13 Format and Signing of Proposal

3.13.1 Bidder shall prepare one set of his Tender excluding Departmental Tender Document including all addenda / corrigenda duly completed and signed, mentioned hereinafter. Form of Bid shall be signed by a person or persons duly authorised to sign on behalf of the Bidder with signature duly witnessed and company seal affixed. The Power of Attorney (in original) authorizing the signatory/s of the Tender shall be enclosed.

3.13.2 If the tender is made by an individual it shall be signed by his full name and his address shall be given. In the event of the tender being submitted by a registered partnership firm, it must be signed individually by each partner thereof. In the event of absence of any partner, it must be signed on his behalf by person holding a proper power-of- attorney authorising him to do so and to bind the partner in all matters pertaining to the contract including the arbitration clause, such power-of-attorney to be attached with the tender which must disclose that the firm is duly registered under Indian Partnership Act. If the tender is made by a Limited Company it shall be signed by a duly authorised person who shall produce with the tender satisfactory evidence of the authorisation. In the case of a Limited Company the tender should be accompanied by the Memorandum and Articles of Association of the Company.

3.14 No Alternative Proposals by Bidders:

Bidders shall submit offers that comply with the requirements of the Bidding documents. Alternatives will not be considered.

3.15 The Proposal/ Technical Bid

3.15.1 Bidders shall submit the proposal in the format at **Appendix-II** including list of all documents accompanying the Bid.

3.15.2 The Proposal shall contain the following:

(i) Bid Security/ Earnest Money Deposit as described in Clause4.3.

(ii) Cost of Tender document as indicated in Table **at Clause 2** of NIT.

(iii) Power of Attorney (in original) in favour of signatory(s) to the Tender, duly authenticated by Notary Public (vide ***Appendix-III***)

(iv) Bid document duly signed and sealed

(v) Details in ***Appendix-IV*** regarding Corporate Information of the Bidder.

(vi) **Copies of PAN and GST registration**

(vii) Certificate of Accreditation under the sector/category of **Ports, harbor, jetties, marine terminals, break waters and dredging,** valid during the entire contract period for carrying out the above.

(viii) The details of the staff/professionals, who will be engaged for the consultancy work (Key Personnel) including their CVs indicating the qualifications, areas of skill, with their previous experience in similar works, shall be submitted along with the Bid in ***Appendix-V.***

(ix) An undertaking that no changes have been made in the Bid document in ***Appendix -VI.***

(x) An undertaking regarding illegal method for influencing Bid process in ***Appendix -VII*** and disclosure of payment made/ proposed to be made to the intermediaries in connection with the Bid in ***Appendix - VIII.***

(xi) An undertaking that Financial Quote is not conditional, as per ***Appendix-IX.***

(xii) Bank information for e- Payment system as per ***Appendix - XII.***

(xiii) Undertaking for Financial Quote as per ***Appendix – XIII***

3.16 Financial Quote /Price Bid

3.16.1 Applicants shall submit the financial proposal **in e-tendering mode** only in the formats at ***Appendix-XIV*** clearly indicating the total cost of the Consultancy in lump sum charges/fees (In Indian Rupees) to be paid by the CoPA for these services/ assignment in both figures and words, and signed by the Applicant's Authorised Representative. In the event of any difference between figures and words, the amount indicated in words shall prevail.

This lump sum charges / fees shall be inclusive of all incidentals, overheads, travelling expenses, preparation of reports, expenditure related to presentations to be made during the execution of assignment, sundries/all other expenditure and all taxes levies and duties but excluding GST, for execution of the services as per this Bid document including the Terms of Reference, amendments, alterations, modifications, if any, to the Bid Document.

NOTE:

a) The lumpsum fees/ charges quoted by the Bidder shall be paid as stage wise payments as prescribed in **Clause 3.6 of ToR** at **Appendix – I.** Income Tax, Professional Tax and any other tax as per statutory provisions of Govt. of India and Kerala State shall be deducted by the CoPA from each invoice. A certificate in this regard shall be furnished by

the CoPA. Exemption from payment of taxes, if any, shall be intimated by the Bidder in advance and necessary documents in this regard shall be furnished.

b) **The Bidder shall specify the PAN No. allotted to him so that CoPA can ascertain his liability to the Income Tax Department.**

3.16.2 NO COUNTER CONDITIONS SHALL BE INCLUDED ANYWHERE IN THE BID. CONDITIONAL BID SHALL BE LIABLE FOR REJECTION.

3.17 Submission of Bid

3.17.1 Bid shall be submitted **through e-tender mode** before 15.00Hrs on **03-04-2023**.

3.17.2 For online submission, the scanned copies of the documents as detailed in **Clause 3.18** below need be submitted through e-Tendering mode on***www.tenderwizard.com/COPT.***

3.17.3 Financial Proposal (Schedule-II) in the provided format shall be submitted only through e-tendering mode on ***www.tenderwizard.com/COPT.*** **In no case shall filled in** Financial Proposal **(Schedule II) be submitted in hard copy, as it shall result in rejection of the tender.**

3.17.4 Tenders shall be submitted **"online"** strictly in accordance with the Instructions to Bidders and Terms & Conditions given in the Tender Document. The Bidders should submit scanned copy of all the required documents such as DD / Pay Order / Banker's Cheque towards the Cost of tender and EMD, etc. through the e-tendering portal.

3.17.5 The Bidder shall submit the originals of: (i) DD/ Pay Order/ Bankers Cheque/ BG towards the cost of Tender Document and EMD, as applicable, (ii) Power of Attorney, if applicable,–**along with letter of submission** in a sealed cover duly mentioning the Tender No. & Name of Work, due date of opening of Bid and Name of the Bidder to the **Chief Engineer, COCHIN PORT AUTHORITY, W/Island, Cochin – 682009, KERALA before *15.00 hrs. on the due date of opening of bids i.e. 03-04-2023***

3.17.6 **Non submission of the original financial instruments towards Cost of Tender Document and EMD within the above period will lead to disqualification of Bids.**

3.17.7 The successful Bidder shall submit original copy of complete Proposal already submitted in e-mode within 7 days of receipt of Letter of Acceptance issued for the Work.

3.18 List of Documents to be submitted:

3.18.1 **List of Documents to be uploaded for online submission of The Proposal**

(i) Scanned copy of financial instruments towards Cost of Tender Document and EMD / Bid Security or scanned notarized copy of Exemption Certificate, as the case may be
(ii) Scanned copies of **Appendices - I to XIII,** duly signed
(iii) Scanned copy of Partnership Deed or Memorandum and Articles of Association of the Company and Registration Certificate of the Company as the case may be.
(iv) Proposal document including all addenda/corrigenda and General Conditions of Contract with Amendments in PDF format.

3.18.2 **List of documents to be submitted in original.**

(i) DD / Pay Order/ Banker's Cheque towards EMD and Cost of Tender Document, as applicable.
(ii) Letter of Submission (vide **Appendix-II)**
(iii) Power of Attorney, duly authenticated by Notary Public (vide **Appendix- III)**

3.19 Late Bids

Bids received after the date and time specified for submission shall not be opened.

3.20 Opening of Technical Bids

3.20.1 The Officer inviting the Bids or his duly authorized assistant will open the bids, on-line, in the presence of intending Bidders who may be present at the time in person or through their authorized representative.

3.20.2 **The Proposal**: **The Proposal** shall be opened in the office of the **Chief Engineer, Cochin Port Authority** after **15.30 Hours** on the last date fixed for receiving the Tenders. Submission of EMD and Cost of document is verified initially. **In case the Earnest Money and Cost of Bid document is not deposited or is not in order, the Bid will not be opened further and hard copy submitted will be returned.**

3.20.3 If all Bidders have submitted unconditional Bids together with requisite Bid Security/EMD, then all Bidders will be so informed.

3.20.4 If any Bid contains any deviation from the Bids documents and /or if the same does not contain Bid Security/EMD in the manner prescribed in the Bid documents **and/or the requirements of Technical evaluation are not met with,** then that Bid will be rejected. The Financial Quote submitted in e- mode will not be opened in that case.

3.20.5 In the event of a tender being rejected, the Earnest Money paid with such unaccepted tender shall be refunded to the Bidder.

3.20.6 **Opening of Financial Quote:**

Financial Bids of those Bidders found responsive in the evaluation of Technical Bid will be opened later. The date and time of opening of Financial quote will be announced in the e-tender portal; separate communication will not be sent to the bidders. Bidder's name, the Bid

Prices, the total amount of each Bid, any discounts and withdrawals as per the terms of this RFP, and such other details as the Employer may consider appropriate can be seen on the tender portal.

3.21 Proposal /Bid Evaluation

3.21.1 Proposals of the Bidders shall be examined in detail for their contents. In the process of this examination, if additional information/clarifications are found necessary, the same shall be sought for furnishing by the Bidder within the specified date, in writing. However the basic proposal shall not be permitted to be changed/ altered either to fulfill Eligibility to Bid or to qualify for meeting the proposal parameters.

3.22 Responsiveness of Proposals

A responsive proposal is one which **conforms to all the requirements** of the Bid document. A proposal shall be treated unresponsive for any or all of the following reasons: -

(i) Validity of the proposal is not confirmed.

(ii) Proposal documents not signed and submitted in full meeting requirements of RFP and not signed and not sealed in the manner prescribed in the proposal document.

3.23 Acceptance of Bid

The Employer does not bind himself to accept the lowest or any Bid and reserves the right to accept any Bid in part or to reject any Bid or all Bids without assigning any reasons whatsoever.

3.24 Currency

3.24.1 The currency for the purpose of the Bid shall be Indian Rupee and all payments due to the consultant under this contract will be made in Indian Rupees only.

D. APPOINTMENT OF CONSULTANT

3.25 Negotiations

3.25.1 The lowest Bidder may, if necessary, be invited for negotiations for exploring possibility of reducing price and for re-confirming the obligations of the Consultant under this Bid. Issues such as, understanding of the ToR, methodology and quality of the work plan shall be discussed during negotiations and re-confirmed.

3.25.2 The Authority will examine the CVs of all other Professional Personnel and those not found suitable shall be replaced by the Bidder to the satisfaction of the Employer.

3.26 Substitution of Key Personnel

3.26.1 The Authority will not normally consider any request of the Selected Bidder for substitution of Key Personnel. Substitution will, however, be permitted if the Key Personnel is not available for reasons of any

incapacity or due to health, subject to equally or better qualified and experienced personnel being provided to the satisfaction of the Authority.

3.26.2 The Employer expects all the Key Personnel to be available during implementation of the Agreement. The Employer will not consider substitution of Key Personnel except for reasons of any incapacity or due to health. Such substitution shall ordinarily be limited to one Key Personnel subject to equally or better qualified and experienced personnel being provided to the satisfaction of the Employer. As a condition to such substitution, a sum equal to 2% (two per cent) of the accepted basic cost of the assignment shall be deducted from the payments due to the Consultant. In the case of a second substitution hereunder, such deduction shall be 5% (five per cent) of the accepted basic cost of the assignment. Any further substitution may lead to disqualification of the Bidder or termination of the Agreement.

3.26.3 Substitution of the Team Leader will not normally be considered and may lead to disqualification of the Bidder or termination of the Agreement.

3.27 Award of Work

3.27.1 The Financial Quote of only those bidders who meet the tender requirements relating to EMD, Cost of Tender Document and found responsive in the evaluation of Technical Bid, shall be opened later. Contract will be awarded to the bidder whose bid has been determined to be responsive and who has offered the lowest lumpsum consultancy fee for the assignment

3.27.2 The successful Bidder shall be issued a work order (Letter of Intent –LoI) by CoPA either by facsimile or email, which will be subsequently confirmed by Registered Post. This LoI along with written acknowledgment of the successful Bidder/ Consultant shall constitute a contract between the Consultant and Cochin Port, till the signing of the formal agreement.

3.28 Signing of Agreement

3.28.1 The Consultant (successful Bidder) shall execute an agreement at his expense on Kerala State stamp paper of proper value in the format set out in ***Appendix-XI*** for the due and proper fulfillment of the contract within two weeks of receipt of the Letter of Intent by facsimile or email by the Consultant or within such time as extended by the Employer. The consultant shall submit 10 (TEN) copies of signed agreement excluding original in bound volume.

3.28.2 The date of commencement of Work shall be reckoned as the actual date on which the Consultant takes over the assignment OR the seventh day from receipt of Letter of Intent by facsimile or email by the Consultant, whichever is earlier.

3.29 Fraud and Corrupt Practices:

The bidder and their respective officers, employees, agents and advisers shall observe the highest standard of ethics during the Selection Process. Notwithstanding anything to the contrary contained in this document, the Port shall reject the tender without being liable in any manner whatsoever to the bidder, if it determines that the bidder has, directly or indirectly or through an agent, engaged in corrupt practice, fraudulent practice, coercive practice, undesirable practice or restrictive practice (collectively the "Prohibited Practices") in the Selection Process. In such an event, the Port shall, without prejudice to its any other rights or remedies, forfeit and appropriate the Bid Security or Performance Security, as the case may be, as mutually agreed genuine pre-estimated compensation and damages payable to the Port for, inter alia, time, cost and effort of the Authority, in regard to the Tender, including consideration and evaluation of such Bidder's Proposal. Such Bidder shall not be eligible to participate in any tender or RFP issued by the Authority during a period of 2 (two) years from the date such Bidder is found by the Authority to have directly or through an agent, engaged or indulged in any corrupt practice, fraudulent practice, coercive practice, undesirable practice or restrictive practice, as the case may be.

For the purposes of this Clause, the following terms shall have the meaning hereinafter respectively assigned to them:

(a) "corrupt practice" means

(i) the offering, giving, receiving, or soliciting, directly or indirectly, of anything of value to influence the action of any person connected with the Selection Process (for avoidance of doubt, offering of employment to or employing or engaging in any manner whatsoever, directly or indirectly, any official of the Authority who is or has been associated in any manner, directly or indirectly with the Selection Process or the LOA or has dealt with matters concerning the Agreement or arising there from, before or after the execution thereof, at any time prior to the expiry of one year from the date such official resigns or retires from or otherwise ceases to be in the service of the Authority, shall be deemed to constitute influencing the actions of a person connected with the Selection Process; or

(ii) engaging in any manner whatsoever, whether during the Selection Process or after the issue of the LOA or after the execution of the Agreement, as the case may be, any person in respect of any matter relating to the Project or the LOA or the Agreement, who at any time has been or is a legal, financial or technical consultant/ adviser of the Authority in relation to any matter concerning the Project;

(b) "fraudulent practice" means a misrepresentation or omission of facts or disclosure of incomplete facts, in order to influence the Selection Process;

(c) "coercive practice" means impairing or harming or threatening to impair or harm, directly or indirectly, any persons or property to influence any person's participation or action in the Selection Process;

(d) "undesirable practice" means

(i) establishing contact with any person connected with or employed or engaged by the Authority with the objective of canvassing, lobbying or in any manner influencing or attempting to influence the Selection Process; or

(ii) having a Conflict of Interest; and

(e) "restrictive practice" means forming a cartel or arriving at any understanding or arrangement among Applicants with the objective of restricting or manipulating a full and fair competition in the Selection Process.

3.30 Commencement and Completion of Work

The Consultant shall commence the Work within 7 (seven) days on receipt of Letter of Intent by facsimile or email by the Consultant and carry out the same expeditiously at whatever point or points and in such portion as the Employer may direct. The submission of reports, presentation if any and completion of Work shall be as stipulated in this Bid document.

SIGNATURE OF THE BIDDER

SECTION – 4

GENERAL TERMS & CONDITIONS

4. GENERAL TERMS & CONDITIONS

4.1 Definitions and Interpretation

4.1.1 The following words and expressions in this Bid document shall have the meanings hereby assigned to them except where the context otherwise requires:

a) **"Employer/CoPA/Port/Cochin Port/Board/Port Authority"** means Board of major Port Authorities of Cochin Port, constituted under Major Port Authority Act, 2021, having its principal office at W/Island, Cochin-9, India and acting through its Chairman, Deputy Chairman or the Chief Engineer or any other officers, so nominated by the Board.

b) **"Bidder/Consultant(s)/Applicant"** means the person or persons, firm, corporation, Consortium or Company who submits a Bid (Proposal/Tender) for the subject Work.

c) **"Award Price/Contract Price"** means the sum indicated in the Price Bid/**Financial Quote** submitted by the successful Bidder with any modification thereof or addition thereto or deduction there from as may be made under the provisions contained in the Tender (Bid/Proposal) Document.

d) **"Chief Engineer"** means the Chief Engineer of COCHIN PORT AUTHORITY for the time being.

e) **"Engineer/Officer-In-Charge"** means Superintending Engineer/ Dy. Chief Engineer/ Executive Engineer in charge of this Work as nominated by Chief Engineer.

f) **"Work/ Assignment"** means the works to be executed by the Consultants detailed in this Bid Document including Terms of Reference.

g) **"Date of Commencement of Work"** means the actual date on which the Consultant takes over the Assignment **OR** the seventh day from receipt of Letter of Intent (work order) by facsimile or email by the Consultant, whichever is earlier.

h) **"Bid Document/ Tender Document/ RFP"** means this document inviting bids from the Consultants for the Assignment.

i) **"Proposal/Bid"** means the Tender document in response to which the Consultant's proposal for providing Services was accepted.

4.1.2 **Notes**

i) ***Singular and Plural***: Words importing the singular only also include the plural and vice versa where the context requires.

ii) ***Headings***: The headings as mentioned in the Bid Document shall not be taken to be part thereof Bid Document or be taken into consideration in the interpretation or construction thereof or of the contract.

4.2 General Provisions

4.2.1 Law Governing the Contract

This Contract, its meaning and interpretation and the relation between the parties shall be governed by the Applicable Law.

4.2.2 Notices

Any notice, request or consent made pursuant to this Contract shall be in writing and shall be deemed to have made when delivered in person to an authorized representative of the Party to whom the communication is addressed, or when sent by registered mail, e-mail or facsimile to such Party at the address specified below:

The Chief Engineer, COCHIN PORT AUTHORITY,
Cochin – 682 009, Kerala, India.
Tel : 91-0484-2666414, 2666871 Extn:2400
Fax : 91-0484-2666414
E-mail: ce@cochinport.gov.in, CoPAce@gmail.com

4.3 Earnest Money Deposit/ Proposal Security

The proposal shall be accompanied by an Earnest Money towards Bid Security amounting to **Rs.25,000/-**. The EARNEST MONEY must be deposited in the manner as specified. Under no circumstances should currency notes be enclosed in the cover containing the Earnest Money. The Earnest Money deposited will not carry any interest. The Earnest Money Deposit (EMD) can be in the form of Demand Draft or Pay Order Banker's Cheque on a Nationalised/ Scheduled Bank drawn in favour of the Financial Advisor & Chief Accounts Officer of the COCHIN PORT AUTHORITY. The Bid Security/EMD of unsuccessful Bidder other than L1 and L2 will be refunded immediately after ranking of the Bids. The Bid Security of L2 Bidder shall be refunded immediately after entering into Agreement with L1 Bidder and acceptance of the Performance Security. The Bid Security of the successful Bidder will be discharged after he has signed the Agreement and furnished the required Performance Security.

4.4 Discount on delay in completion

4.4.1 In case of delay in completion of Services as per the schedule prescribed in the tender document for each event as specified at Clause 3.6 of the ToR, discount of 0.2% of total contract price per day, subject to a maximum of 10% will be imposed. However in case of delay due to reasons beyond the control of the Consultant, suitable extension shall be granted.

4.5 Care and diligence

4.5.1 The Consultant shall exercise all reasonable care and diligence in the discharge of all technical, professional and contractual duties to be performed by them under this contract and shall be fully responsible to the

Employer for the proper, timely, efficient and effective execution of their duties.

4.5.2 The Consultant shall perform the Work in a professional manner, using sound engineering and design principles and management and supervisory procedures, and in accordance with the standards employed by leading international engineering firms in the field. By submitting the Bid, the Consultant represents that it has the required skills and capacity to perform the Work in the foregoing manner.

4.6 Taxes & duties

4.6.1 The Bidder and his staff shall be responsible for payment of all personal income taxes to the concerned authorities as per the law in force from time to time. Deduction of Income Tax shall be made by the Employer from each certificate of payment to the Bidder at the rate of 2% plus surcharge or such other rates as may be specified by the Central Government from time to time, on the gross amount of the Consultant's bill for payment.

4.6.2 The Bidder shall comply all the GST Regulations viz. timely uploading of bills, issue of debit/ credit notes etc.

4.7 Confidentiality

The Consultant shall treat all the documents and information received from CoPA and all other related documents/communications including the documents prepared by the consultant as part of this consultancy work in confidence and shall ensure that all who have access to such material shall also treat them in confidence. The Consultant shall not divulge any such information unless CoPA authorizes the consultant in advance in writing. Further, the Consultant shall return all the documents received from CoPA from time to time after completion of the Work related to those documents. **The Successful Bidder / Consultant may also be required to execute a Non-disclosure Agreement in this connection in a format which would be provided later.**

4.8 Suspension of Work

If any of the following events shall have happened and be continuing, then CoPA may, by written notice to the Consultant, suspend in whole or in part, payment due thereafter to the Consultant under the contract:

a) A default shall have occurred on the part of the Consultant in the execution of the contract.

b) Any other condition which makes it unable for either party by reason of "Force Majeure" as referred to in **Clause 4.11** to successfully carry out the Work or to accomplish the purpose of the contract.

4.9 Termination of Work

4.9.1 Termination of Work by CoPA

If any of the following events shall have happened and be continuing, then COCHIN PORT AUTHORITY may, by written notice to the Consultant, terminate the contract:

a) Any of the conditions referred to in **Clause 4.11** shall continue for a period of two weeks after CoPA shall have given written notice to the Consultant of the suspension of payment to the Consultant under the contract.

b) In any event, CoPA may terminate the contract at any time by giving not less than two weeks prior notice to the Consultant.

4.9.2 Termination of the Work by the Consultant

The Consultant shall promptly notify CoPA in writing of any situation or of the occurrence of any event beyond the reasonable control of the Consultant, which makes it impossible for the Consultant to carry out its obligations under the contract. Upon confirmation in writing by the CoPA of the existence of any such situation or event, or upon failure of the CoPA to respond to such notice within 15 (fifteen) days of receipt thereof, the Consultant shall be relieved from all liability from the date of such receipt for failure to carry out such obligations, and the Consultant may thereupon terminate the Contract by giving not less than 15 (fifteen) days prior written notice thereof.

4.10 Termination Procedure

a) Upon termination of the Contract under **Clause 4.9** or receipt of notice of Termination under Clause 4.9.1 giving notice of termination under Clause 4.9.2, the Consultant shall take immediate steps to terminate the Work in a prompt and orderly manner and to reduce losses and to keep further expenditure to a minimum.

b)Upon termination of the contract (unless such termination shall have been occasioned by the default of the Consultant), the Consultant shall be entitled to be reimbursed in full for such costs as shall have been duly incurred prior to the date of such termination.

4.11 Force Majeure

a) If either party is temporarily unable by a reason of Force Majeure or the laws or regulations of India to meet any of its obligations under the contract, and if such party gives to the other party written notice of the event within two weeks after its occurrence, such obligations of the party as it is unable to perform by reason of the event, shall be suspended for, as long as the inability continues.

b) Neither party shall be liable to the other party for loss or damage sustained by such other party arising from any event referred to in Clause (a) above or delays arising from such event.

c) The term —Force Majeurel as employed herein, shall mean —Act of God, Strike, Lock-outs or other Industrial Disturbances, Insurrection, Riots, Epidemics, Land Slides, Earth Quakes, Storms, Lightening, Floods, Wash Outs, Civil Disturbances, Explosions and any other similar event not within the control of either party, and which, by the exercise of due diligence, neither party is able to overcomel.

d) Force Majeure shall not include (i) any event which is caused by the negligence or intentional action of a Party or such party's associates/affiliates or agents or employees, nor (ii) any event which a diligent party could reasonably have been expected to both (A) take into account at the time of the conclusion of this contract and (B) avoid or overcome in the carrying out of its obligations hereunder.

4.12 Dispute between the Consultant and Cochin Port

The settlement of disputes and arbitration shall be as below.

4.12.1 General

Except where otherwise provided in the contract all questions and disputes relating to the meaning of the specifications, design, drawings and instructions here-in before mentioned and as to the quality of workmanship or materials used on the work or as to any other question, claim, right, matter or thing whatsoever in any way arising out of or relating to the contract, designs, drawings, specifications, estimates, instructions, orders or these conditions or otherwise concerning the works or the execution or failure to execute the same whether arising during the progress of the work or after the cancellation, termination, completion or abandonment thereof shall be dealt with as mentioned hereinafter:-

If the Consultant considers any work demanded of him to be outside the requirements of the contract, or disputes any drawings, record or decision given in writing by the Engineer on any matter in connection with or arising out of the contract or carrying out of the work, to be unacceptable, he shall promptly within 15 days request the Engineer in writing for written instruction or decision. Thereupon, the Engineer shall give his written instructions or decision within a period of one month from the receipt of the Consultant's letter.

If the Engineer fails to give his instructions or decision in writing within the aforesaid period or if the Consultant is dissatisfied with the instructions or decision of the Engineer, the Consultant may, within 15 days of the receipt of Engineer's decision, appeal to the Chairman who shall afford an opportunity to the Consultant to be heard, if the latter so desires, and to offer evidence in support of his appeal. The Chairman shall give his decision within 30 days of receipt of Consultant's appeal. If the Consultant is dissatisfied with this decision then:

a) The Dispute in respect of contract of value upto Rs. 1crore shall not be referred for adjudication through arbitration and.

b) If the value of the contract is exceeding Rs.1 crore and upto Rs.5 crores, the Dispute shall be resolved through arbitration by a sole arbitrator appointed by the Chairman of COCHIN PORT AUTHORITY :

(i) The Consultant shall within a period of 30 days from receipt of the decision of the Chairman, give notice to the Chairman for appointment of arbitrator, failing which, the said decision shall be final, binding and conclusive and not referable to adjudication by the arbitrator.

(ii) If the arbitrator so appointed is unable or unwilling to act or resigns his appointment or vacates his office due to any reason whatsoever another sole arbitrator shall be appointed in the manner aforesaid. Such person shall be entitled to proceed with the reference from the stage at which it was left by his predecessor.

c) If the value of the Contract is above Rs.5 crores, the Consultant shall within 30 days of receipt of the decision of the Chairman, appoint an arbitrator and give notice to the Chairman and the dispute shall be resolved through Arbitral Tribunal as detailed below:

The Arbitral Tribunal shall be a panel of three arbitrators, one to be appointed by each Party and the third to be appointed by the two Arbitrators appointed by the Parties. A Party requiring Arbitration shall appoint an Arbitrator in writing, inform the other Party about such appointment and call upon the other Party to appoint its Arbitrator. If the other Party fails to appoint its Arbitrator, the Party appointing Arbitrator shall take steps in accordance with Arbitration and Conciliation Act, 1996 or any statutory modifications or reenactment thereof

d) In the event of any dispute or difference relating to the interpretation and application of the provisions of commercial contract(s) between Central Public Enterprises (CPSEs) / Port Authorities inter-se or CPSE and Government Departments, it shall be referred for resolution through Administrative Mechanism for Resolution of CPSEs Disputes (AMRCD).

4.12.1.1 It is a term of this contract that the party invoking arbitration shall give a list of disputes with amounts claimed in respect of each such dispute along with the notice for appointment of arbitrator and giving reference to the rejection by the Chairman of the appeal.

4.12.1.2 It is also a term of this contract that no person other than person / persons appointed as aforesaid should act as arbitrator / arbitrators and if for any reason that is not possible, the matter shall not be referred to arbitration at all.

4.12.1.3 It is also a term of this contract that if the Consultant does not make any demand for appointment of arbitrator in respect of any claims in writing as aforesaid within 120 days of receiving the intimation from the Engineer that the final bill is ready for payment, the claim of the Consultant shall be deemed to have been waived and absolutely barred and the Employer or his authorized representative shall be discharged and released of all liabilities under the contract in respect of these claims.

4.12.1.4 The arbitration shall be conducted in accordance with the provisions of the Arbitration and Conciliation Act, 1996 (26 of 1996) or any statutory modifications or reenactment thereof and the rules made there under and for the time being in force shall apply to the arbitration proceeding under this clause.

4.12.1.5 It is also a term of this contract that the Arbitrator / Arbitral Tribunal shall adjudicate only on such disputes as are referred to him/them and give separate award against each dispute and claim referred and in all cases where the total amount of the claims by any party exceeds Rs. 1,00,000/- the arbitrator shall give reasons for the award.

4.12.1.6 It is also a term of the contract that if any fees are payable to the arbitrator these shall be paid equally by both the parties.

4.12.1.7 It is also a term of the contract that the arbitrator/arbitrators shall be deemed to have entered on the reference on the date he / they issues notice to both the parties calling them to submit their statement of claims and counter statement of claims. The venue of the arbitration shall be at Cochin. The fees, if any, of the arbitrator shall, if required to be paid before the award is made and published, be paid half and half by each of the parties. The cost of the reference and of the award (including the fees, if any, of the arbitrator) shall be in the discretion of the arbitrator who may direct to any party by whom and in what manner, such costs or any part thereof shall be paid and fix or settle the amount of costs to be so paid."

4.12.2 Settlement of Disputes through Conciliation

In the event of any dispute or differences between the parties which could not be resolved amicably by mutual consultations/ Arbitration, then the Chairman of COCHIN PORT AUTHORITY may refer such unresolved disputes or differences to a Conciliation Committee/Council comprising of independent subject experts, set up by the Port Trust to enable speedy disposal of pending/new cases. Recourse to such conciliation shall be open before, during or after the arbitration proceedings. The award of the Conciliation Committee/Council, if agreed by both the parties, shall then be placed for consideration of the Board of Trustees of Cochin Port subject to the delegation of powers.

4.13 Completion Certificate

A completion certificate shall be issued by the Employer on completion of all the tasks and submission of all reports/documents as indicated in the Bid Document, to the satisfaction of the Employer.

4.14 Obligations of the Consultant

4.14.1 Documents prepared by the Consultant to be the Property of the Employer

All plans, drawings, specifications, designs, reports and other documents and software submitted by the Consultant under this contract shall become and remain the property of the Employer, and the Consultant shall, not later than upon termination or expiration of this contract, deliver all such documents to the employer. The Consultants may retain a copy of such

documents. However, the Consultant shall not use these documents for purpose unrelated to this Contract without prior approval of the employer.

4.15 Facilities to be made available to the Consultant

The COCHIN PORT AUTHORITY would provide access to all available documents and data relating to the port, that may be reasonably needed for the proposed assignment of the Consultant as highlighted in this Bid Document.

4.16 Performance Security

4.16.1 Within 14 (fourteen) days of the receipt of the Letter of Intent from CoPA, the Successful Bidder shall furnish to the CoPA a Performance Security for satisfactory completion of the assignment, in the form of a Bank Guarantee of a Nationalized/Scheduled Bank, operating in India, for an amount equivalent to **3%** of the Award Price/Contract Price as per the draft annexed at **Appendix-X** to the Bid Document. Failure of the Successful Bidder to lodge the required Bank Guarantee shall constitute sufficient grounds for the termination of the contract and enforcement of Demand Draft towards EMD. The Performance Security shall remain in force till 30 days after the satisfactory completion of the contract and will be discharged thereafter subject to the condition stated therein. The obtaining of such guarantee (and the cost of guarantee) shall be at the expense of the Bidder.

4.16.2 In the event of the tenderer, after the issue of the communication of acceptance of offer by the Board, failing/refusing to execute the agreement as hereinafter provided, the tenderer shall be deemed to have abandoned the contract and such an act shall amount to and be construed as Consultant's calculated and the willful breach of the contract, the cost and consequence of which shall be to the sole account of the Consultant and upon such an event the Board shall have full right to claim damages therefore either together with or in addition to the forfeiture of Earnest Money Deposit.

4.17 Insurance to be taken by the Consultant in joint names between Consultant and Board of Trustees of CoPA

The Consultant: (i) shall take out and maintain, and shall cause to take out maintain, at their own cost, insurance against the risks, and for the coverage, as mentioned below, and (ii) at the Employer's request, shall provide evidence to the Employer showing that such insurance has been paid.

The risks and the coverages shall be as follows:

(a) Workers' Compensation Insurance in respect of the Personnel of the

Consultant in accordance with the relevant provisions of the Applicable Law, as well as, with respect to such Personnel, any such life, health, accident, travel or other insurance as may be appropriate.

4.18 Safety Measures

The Consultant shall be liable for payment of all claims of damages, compensation or expenses payable as a result of any accident or injury or death sustained by workmen employed or used by him in the execution of this contract. The expenses if any, incurred by CoPA on the above will be recovered from the Consultant from any amount that may be due from CoPA to the Consultant. If any accident or injury or death is sustained by any worker, the Consultant should immediately take necessary action for providing medical aid at his own cost and inform the concerned Employer and the authorities of Kochi City Police about the accident in writing giving full particulars of accident and the details of the workmen involved including their name, age and company.

4.19 Additions and Alterations

If the Consultant is required to carry out any additional work outside the scope of the study as required by CoPA, the Consultant shall perform such services, on terms and conditions to be mutually agreed upon by both the parties, at the discretion of the port.

SIGNATURE OF THE BIDDER

APPENDICES

Appendix-I

PROVIDING CONSULTANCY SERVICES FOR QUANTITATIVE RISK ANALYSIS ALONG WITH CLOSURE REPORT AND ENVIRONMENTAL IMPACT ASSESSMENT STUDY WORKS IN CONNECTION WITH HANDLING AMMONIUM NITRATE AT Q7 BERTH OF COCHIN PORT

TERMS OF REFERENCE (ToR)

1. BACKGROUND:

The existing Port facilities are located mainly on W/Island, having an area of about 385 hectares. There are two wharves on W/Island, viz., Mattancherry Wharf and Ernakulam Wharf. The Mattancherry Wharf is 670 m long with four along side berths and the Ernakulam Wharf is 917m long with five along side berths. There are three oil berths, viz., Cochin Oil Terminal (COT), North Tanker Berth (NTB) and South Tanker Berth (STB) which can accommodate 1,15,000 DWT, 30,000 DWT and 18,000 DWT vessels respectively. Other berthing facilities comprise of a Fertilizer Berth, which can accommodate vessels of 60,000 DWT, one Boat Train Pier, which can accommodate 35,000 DWT vessels and two jetty berths for miscellaneous cargo with capacity for vessels upto 12,000 DWT and 35,000 DWT.

Now, Cochin Port Authority (CoPA) proposes to handle import of Ammonium Nitrate at Q7 berth of Ernakulam wharf at W/Island.

2. OBJECTIVE OF ASSIGNMENT:

In terms of Ammonium Nitrate Rules 2012, Port is required to be notified by Ministry of Ports, Shipping Waterways (MoPS&W) for facilitating handling this cargo. In this regard Port has been directed to obtain 'No Objection Certificate' from the Petroleum and Explosives Safety Organisation (PESO) and CoPA has to furnish Quantitative Risk Analysis along with closure report and Environmental Impact Assessment study including Disaster Management plan to PESO for the same.

3. SCOPE OF THE CONSULTANCY SERVICES:

Scope includes carrying out Quantitative Risk Analysis along with closure report and Environment Impact Assessment (EIA) study works covering the required EIA studies, Disaster Management Plan (DMP) & Environmental Management Plan (EMP) etc., and submitting reports as per the latest guidelines/ circulars/ notifications of MoEF&CC, Government of India in connection with the project, CoPA proposes to avail the services of an Accredited EIA Consultant of MoEF&CC/ National Accreditation Board for Education and Training (NABET) under sector/category of "Ports, harbor, jetties, marine terminals, break waters and dredging".

The reports shall meet all the requirements of PESO for handling Ammonium Nitrate at the proposed berth of Cochin Port.

The consultant shall provide all technical assistance for submission of reports to PESO for obtaining NoC as well as clearance from MOPS&W, if required, including presentation of the report before the Technical Committee.

4. DELIVERABLES:

The various reports and documents (hard or soft copies) shall be submitted in accordance with the schedule as set forth below:-

1. Inception Report : Six Hard copies and one soft copy;
2. Draft report of Quantitative Risk Analysis along with closure report : Six Hard copies & one soft copy and its presentation
3. Draft Report of Environment Impact Assessment (EIA) study works covering the required EIA studies, Disaster Management Plan (DMP) & Environmental Management Plan (EMP) etc.: Six Hard copies & one soft copy and its presentation
4. Final Report of Quantitative Risk Analysis along with closure report : Six Hard copies & one soft copy and its presentation
5. Final Report of Environment Impact Assessment (EIA) study works covering the required EIA studies, Disaster Management Plan (DMP) & Environmental Management Plan (EMP) etc.: Six Hard copies & one soft copy and its presentation
6. Technical and all required assistance for submission of reports to PESO, including presentation before Technical Committee of PESO/ MoPS&W if required.

5. PAYMENT TO THE CONSULTANTS

5.1. In consideration of the Services performed by the Consultants under this Contract, the Cochin Port shall make to the Consultants eligible payments in such manner as is provided in clause 6.1 of this ToR. Payment shall be made to the Bank directly.

5.2 Remuneration towards Performance of Assignment by the Consultant shall be as per terms and conditions of accepted "Financial Proposal" against invoices of the Consultant.

a) The payment towards Performance of Assignment will be made as per **clause** TIME AND PAYMENT SCHEDULE

b) The Authority shall pay consultancy fees in Indian Rupees only as per terms and conditions of accepted "Financial Proposal" against invoices of the Consultant.

c) In the event of termination of construction contract or removal of contractor, no further payment beyond 15 days shall be made to the Consultant, till it is decided by the Authority, if the services of the Consultant/ personnel are required or not and in which case the entire situation shall be reviewed.

d) Payments to be made by the Authority hereunder shall be strictly subject to, and representative of, satisfactory progress achieved by the Consultant.

e) As soon as practicable after the completion of the Services or termination of the Contract, the Consultant shall submit to the Authority, the Final Statement of Eligible payments.

f) Final payment pursuant to Financial Proposal shall be made by the Authority only after the Final Statement and the Final Report have been submitted by the Consultant and approved by the Authority. The Consultant shall submit the Final Statement to the Authority within 120 calendar days of the date of

approval by the Authority of the Final Report. Should any discrepancy be found to exist between the actual payments made by the Authority and the costs authorized to be incurred by the Consultant pursuant to this Contract, the final payment shall be adjusted by the Authority to reflect such discrepancy. The Consultant shall reimburse any amount that the Authority has paid or caused to be paid in accordance with this Section in excess of the costs actually incurred to the Authority within 3 days after receipt by the Consultant of notice thereof.

g) Authority shall pay to the Consultants the amounts claimed within 21 (twenty one) calendar days after receipt of satisfactory statements and supporting documents. The Authority may add to or subtract from any subsequent payment any amount to cover the difference between the amount paid and the cost authorized to be incurred.

h) Payments do not constitute acceptance of the Services nor relieve the Consultant of any obligations hereunder.

i) Payments shall be made in accordance with Clause 6.1. No interest is admissible on outstanding amounts by the Authority.

6. REMUNERATION

It is understood that the Lumpsum Fee quoted by the Consultants shall be the all inclusive firm price (excluding GST) which shall be valid till completion of all related works and it shall cover: (A) such salaries and allowances as the Consultants shall have to pay to the Personnel as well as factors for social charges and overhead, and (B) the cost of back supporting by home office staff not included in the Personnel listed and (C) the Consultants" fee, (D) bonuses or other means of profit-sharing, if any and (E) all other expenditure involved in providing the Services as per the agreement which are not specifically stated herein above.

6.1. TIME AND PAYMENT SCHEDULE

The total duration envisaged for the assignment is 2 months. Time schedule for important Deliverables of the Consultancy and the Payment Schedule linked to the specified Deliverables are given below:

Sl. No.	Description of Deliverables	Time Schedule wrt Date of Commencement	% of Total Consultancy Fee
1	Inception Report :	2 weeks	10
2	Draft report of Quantitative Risk Analysis along with closure report and its presentation	5 weeks	20
3	Draft Report of Environment Impact Assessment (EIA) study works covering the required EIA studies, Disaster Management Plan (DMP) & Environmental Management Plan (EMP) etc and its presentation, as required	5 weeks	20

4	Final Report of Quantitative Risk Analysis along with closure report : Six Hard copies & one soft copy and its presentation	7 weeks	20
5	Final Report of Environment Impact Assessment (EIA) study works covering the required EIA studies, Disaster Management Plan (DMP) & Environmental Management Plan (EMP) etc and its presentation	7 weeks	20
6	On Submission to PESO by CoPA…	2 months	10
	TOTAL	**2 months**	**100**

In case for any reason the Assignment is foreclosed, percentage payment due upto the completed stage will be made as indicated above and in case Assignment foreclose in the middle of any indicated stage, pro-rata payment shall be made for the completed services as assessed by the Authority and the Authority's decision in this regard shall be final.

6.2. DOCUMENTS TO BE MADE AVAILABLE BY THE AUTHORITY

Available data as may be required by the Consultant will be provided by the Authority on request. The Nodal Officer designated by the Authority shall facilitate handing over of such information to the Consultant.

Appendix-II

THE PROPOSAL

Letter of Proposal

(On Applicant's letter head)

(Reference No and Date)

To

The Chief Engineer,
COCHIN PORT AUTHORITY,
Willingdon Island,
Kerala, India.
Pin - 682 009.

Sub: Providing consultancy services for Quantitative Risk Analysis along with closure report and Environmental Impact Assessment study works in connection with handling Ammonium Nitrate at Q7 berth of Cochin Port.

Dear Sir,

With reference to your Bid Document dated ....., I/we, having examined all relevant documents and understood their contents, hereby submit our Proposal for selection as Consultant for Providing Consultancy for preparation of Detailed Project Report and Tender Document for the proposed Green Warehouse project in Mattancherry Wharf at Cochin Port under EPC/PPP Mode. The Bid is unconditional and unqualified.

2. All information provided in the Bid and in the Appendices is true and correct and all documents accompanying such Bid are true copies of their respective originals.
3. This statement is made for the express purpose of appointment as the Consultant for the aforesaid Project.
4. I/We shall make available to the Authority any additional information it may deem necessary or require for supplementing or authenticating the Bid.
5. I/We acknowledge the right of the Authority to reject our application without assigning any reason or otherwise and hereby waive our right to challenge the same on any account whatsoever.
6. I/We certify that in the last three years, we have neither failed to perform on any contract, as evidenced by imposition of a penalty by an arbitral or judicial authority or a judicial pronouncement or arbitration award against the Applicant, nor been expelled from any project or contract by any public authority nor have had any contract terminated by any public authority for breach on our part.
7. I/We declare that:
   (a)I/We have examined and have no reservations to the Bid Documents, including any Addendum issued by the Authority;
   (b) I/We do not have any conflict of interest in accordance with Clause 3.2 of the Bid Document;

(c)I/We have not directly or indirectly or through an agent engaged or indulged in any corrupt practice, fraudulent practice, coercive practice, undesirable practice or restrictive practice in respect of any tender or bid issued by or any agreement entered into with the Authority or any other public sector enterprise or any government, Central or State; and

8. I/We understand that you may cancel the Selection Process at any time and that you are neither bound to accept any Bid that you may receive nor to select the Consultant, without incurring any liability to the Applicants in accordance with **Clause 3.8** of the Bid document.
9. I/We certify that in regard to matters other than security and integrity of the country, we or any of our Associates have not been convicted by a Court of Law or indicted or adverse orders passed by a regulatory authority which would cast a doubt on our ability to undertake the Consultancy for the Project or which relates to a grave offence that outrages the moral sense of the community.
10. I/We further certify that in regard to matters relating to security and integrity of the country, we have not been charge-sheeted by any agency of the Government or convicted by a Court of Law for any offence committed by us or by any of our Associates.
11. I/We further certify that no investigation by a regulatory authority is pending either against us or against our CEO or any of our Directors/Managers/ employees.
12. I/We hereby irrevocably waive any right or remedy which we may have at any stage at law or howsoever otherwise arising to challenge or question any decision taken by the Authority [and/ or the Government of India] in connection with the selection of Consultant or in connection with the Selection Process itself in respect of the above mentioned Project.
13. The **Bid Security of Rs.25,000/-** (Rupees Twenty five Thousand only) in the form of a Demand Draft is attached, in accordance with the Bid document.
14. I/We agree and understand that the Bid is subject to the provisions of the Bid document. In no case, shall I/we have any claim or right of whatsoever nature if the Consultancy for the Project is not awarded to me/us or our Bid is not opened or rejected.
15. I/We agree to keep this offer valid for 120 (One hundred and twenty) days from the Bid Due Date specified in the Bid.
16. A Power of Attorney in favour of the authorised signatory to sign and submit this Bid and documents is attached herewith in ***Appendix-III***.
17. In the event of my/our firm/ consortium being selected as the Consultant, I/we agree to enter into an Agreement in accordance with the form at ***Appendix-XI*** of the Bid. We agree not to seek any changes in the aforesaid form and agree to abide by the same.
18. I/We have studied Bid and all other documents carefully and also surveyed the Project site. We understand that except to the extent as expressly set forth in the Agreement, we shall have no claim, right or title arising out of any documents or information provided to us by the Authority or in respect of any matter arising out of

or concerning or relating to the Selection Process including the award of Consultancy.

19. The Financial Quote is being submitted in a separate cover. This Proposal read with the Financial Quote shall constitute the Application which shall be binding on us.
20. I/We agree and undertake to abide by all the terms and conditions of the Bid Document. In witness thereof, I/we submit this Bid under and in accordance with the terms of the Bid Document.

Yours faithfully,

(Signature, name and designation of the authorised signatory)
(Name and seal of the Applicant)

Appendix-III

POWER OF ATTORNEY FOR SIGNING OF BID

(To be executed on Non-judicial Stamp Paper of proper value)

Know all men by these presents, We _____ (name of the firm and address of the registered office) (hereby referred as —the Principall) do hereby irrevocably constitute, nominate, appoint and authorize Shri/Smt. (name), ... son/daughter/wife of ..... and presently residing at ....., who is presently employed with us/ and holding the position of..... , as our true and lawful attorney (hereinafter referred to as the "Attorney") to do in our name and on our behalf, all such acts, deeds and things as are necessary or required in connection with or incidental to submission of our Bid for the Assignment of ..... (hereinafter referred to as "the Assignment") for which the Board of Trustees of Port of Cochin (hereinafter referred to as "the Port Authority") has invited Bids, including but not limited to signing and submission of all applications, Bids and other documents and writings, participating in Pre-Bid Conference and other conferences and providing information/ responses to the Port Authority representing us in all matters before the Port Authority, signing **the agreement** and execution of the Assignment consequent to acceptance of our Bid, and generally dealing with the Port Authority in all matters in connection with or relating to or arising out of our Bid for the Assignment and/ or upon award thereof to us and/or till the satisfactory completion of the Assignment.

AND we hereby agree to ratify and confirm and do hereby ratify and confirm all acts, deeds and things lawfully or otherwise done or caused to be done by our said Attorney pursuant to and in exercise of the powers conferred by this Power of Attorney and that all acts, deeds and things done by our said Attorney in exercise of the powers hereby conferred shall and shall always be deemed to have been done by us.

IN WITNESS WHEREOF WE, ..., THE ABOVE NAMED PRINCIPAL HAVE EXECUTED THIS POWER OF ATTORNEY ON THIS ..... DAY OF ..... 20..

For .....

(Signature, name, designation and address)

Accepted

.....
(Signature)

(Name, Title and Address of the Attorney)

Witnesses:

1.....(Notarised)

Notes:

1. The mode of execution of the Power of Attorney should be in accordance with the procedure, if any, laid down by the applicable law and the charter documents of the executant(s) and when it is so required, the same should be under common seal affixed in accordance with the required procedure.

2. Wherever required, the Bidder should submit for verification the extract of the charter documents and documents such as a resolution/ Power of Attorney in favour of the person executing this Power of Attorney for the delegation of power hereunder on behalf of the Bidder.

3. For a Power of Attorney executed and issued overseas, the document will also have to be legalised by the Indian Embassy and notarised in the jurisdiction where the Power of Attorney is being issued. However, the Power of Attorney provided by Bidders from countries that have signed the Hague Legislation Convention 1961 are not required to be legalised by the Indian Embassy if it carries a conforming Apostle certificate.

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Appendix- IV

FORMAT OF CORPORATE INFORMATION OF BIDDER

1. Generals Details:
   a) Name
   b) Country of incorporation
   c) Address of the corporate headquarters and the branch office (s), if any in India
   d) Date of incorporation and / or commencement of business

2. (a) Brief description of the Company.

3. Details of individual or individuals who will serve as the point of contact / communication for the Port Authority within the Company with following information
   a) Name
   b) Designation
   c) Company
   d) Address
   e) Telephone number (Land line & Mobile No.)
   f) e- mail address (2 Nos.)
   g) Fax number

4. Name ,designation, address and phone number of authorized signatory of the Bidder
   a) Name
   b) Designation
   c) Address
   d) Phone No.
   e) Fax No.
   f) e- mail address

******

Appendix-V

SHEET-1:COMPOSITION OF THE TEAM PERSONNEL AND TASK(S) OF EACH TEAM MEMBER FOR THE CONSULTANCY WORK

Sl. No.	Name of person	Position	Task*
1			
2			
3			

* The tasks assigned to each Key Personnel for providing the consultancy work under this Bid are to be provided in this column.

Appendix-VI

PROFORMA OF UNDERTAKING THAT NO CHANGES HAVE BEEN MADE IN THE BID DOCUMENT DOWNLOADED

To

The Chief Engineer,
COCHIN PORT AUTHORITY,
Cochin 682009.
Kerala, India.

Dear Sir,

We ..... do hereby confirm that no changes have been made in the Bid document downloaded and submitted by us for the Bid No.....

Yours faithfully,

(Signature)
Name & Designation

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Appendix-VII

PROFORMA OF UNDERTAKING REGARDING ILLEGAL METHODS FOR INFLUENCING BID PROCESS

To

The Chief Engineer,
COCHIN PORT AUTHORITY,
Cochin 682009.
Kerala, India.

Dear Sir,

I/ We do hereby undertake that I/We have not made any payment or illegal gratification to any person/authority connected with the bid process of Bid No..... so as to influence the bid process and have not committed any offence under the PC Act in connection with the Bid.

Yours faithfully,

Signature :

Name & Designation:

****

Appendix –VIII

PROFORMA OF DISCLOSURE OF PAYMENT MADE/ PROPOSED TO BE MADE TO THE INTERMEDIARIES IN CONNECTION WITH THE BID

To

The Chief Engineer,
COCHIN PORT AUTHORITY,
Cochin 682009.
Kerala, India.

Dear Sir,

I/We have made / proposed to make the following payments in connection with the BidNo. .....

1. ..... to Mr./Ms./Messrs.....(Name and Address)
2. ..... to Mr./Ms./Messrs.....(Name and Address)
3. ..... to Mr./Ms./Messrs.....(Name and Address)

Yours faithfully,

Signature :

Name & Designation :

Note : In case no payment is made or proposed to be made a "Nil" statement shall be enclosed.

Appendix – IX

PROFORMA OF UNDERTAKING THAT THE FINANCIAL QUOTE IS NOT CONDITIONAL

To

The Chief Engineer,
COCHIN PORT AUTHORITY,
Cochin 682009.
Kerala, India.

Dear Sir,

We .....

do hereby confirm that THE Financial Quote of the Bid submitted by us for the Bid No. ..... is not conditional.

Yours faithfully,

Signature :

Name & Designation:

Appendix - X

BANK GUARANTEE TOWARDS PERFORMANCE SECURITY

(To be issued by a Scheduled Bank / Nationalised Bank in India on Non-judicial Stamp Paper of proper value)

Ref No.:.....Bank Guarantee No. .....

Date :.....

To

COCHIN PORT AUTHORITY,
Willingdon Island,
Cochin 682009.

Dear Sirs,

In consideration of Board of Major Port Authority for Cochin Port (hereinafter referred to as the "Port Authority" which expression unless repugnant to the context or meaning thereof includes its successors, administrators and assigns) having awarded to M/s.....with its Registered /Head Office at..... ..... (hereinafter referred to as the "CONSULTANT" which expression shall unless repugnant to the context or meaning thereof, include its successor, administrators, executors and assigns), a "Contract" by issue of Port Authority 's work order dated ..... the same having been unequivocally accepted by the CONSULTANT resulting in a Contract bearing No..... dated..... value at..... for ..... and the CONSULTANT having agreed to provide a Contract Performance Guarantee for the faithful performance of the entire Contract equivalent to ....., to Port Authority.

We ..... having its Head Office at ..... (hereinafter referred to as the —Bankl, which expression shall unless repugnant to the context or meaning thereof, include its successors, administrators, executors and assigns) do hereby guarantee and undertake to pay the Port Authority on demand any and all money payable by the CONSULTANT to the extent of..... as aforesaid at any time upto ..... Without any demur, reservation, contest, recourse or protest and/or without any reference to the CONSULTANT. Any such demand made by the Port Authority on the Bank shall be conclusive and binding notwithstanding any difference between Port Authority and CONSULTANT or any dispute pending before any Court, Tribunal, Arbitrator or any other Authority. The Bank undertakes not to revoke this guarantee during its currency without previous consent of Port Authority and further agrees that the guarantee herein contained shall continue to be in enforceable till the Port Authority discharges its guarantee.

Port Authority shall have the fullest liberty without affecting in any way the liability of the Bank under this guarantee to extend from time to time the period for performance of the CONTRACT by CONSULTANT. Port Authority shall have the fullest liberty, without

affecting this guarantee, to postpone from time to time the exercise of any powers vested in them or of any right which they might have against consultant, and to exercise the same at any time in any manner and either to enforce or to forebear to enforce any covenants, contained or implied, in the CONTRACT between Port Authority and CONSULTANT or any other course of remedy or security available to Port Authority. The Bank shall not be released of its obligations under these presents by any exercise by Port Authority of its liberty with reference to the matters aforesaid or any of them or by reason or any other acts of omission or commission on the part of Port Authority or any other indulgence shown by Port Authority or by any other matter or thing whatsoever which under Laws would, but for this provision, have the effect of relieving the Bank.

The Bank also agrees that Port Authority at its option shall be entitled to enforce this Guarantee against the Bank as principal debtor, in the first instance without proceeding against CONSULTANT and notwithstanding any security or other guarantee that Port Authority may have in relation to the CONSULTANT'S liabilities.

This Guarantee shall be valid up to ..... unless extended on demandby Port Authority . Notwithstanding anything mentioned above, our liability against this guarantee is restricted to Rs. ..... (Rupees .... only) and unless a claim in writing is lodged with us within six months of the date of expiry of or the extended date of expiry of this Guarantee all our liabilities under this guarantee shall stand discharged.

Dated this .....day of 2023

WITNESSES:

.....	.....
.(Signature)	.(Signature)
.....	.....
.(Name)	.(Name)

Bank's Rubber Stamp

.....	
(Name)	(Name)
.....	
(Official address)	(Designation with Bank Stamp)

+ Attorney as per Power of Attorney

No. .....

Dated .....

Notes:

+ In case of foreign Bank Guarantees, the same shall be routed through their corresponding bank operating in India.

Appendix – XI

FORM OF AGREEMENT

(To be submitted on Kerala State Stamp Paper of proper value)

THIS AGREEMENT is made on the ..... day of .....Between COCHIN PORT AUTHORITY , W/Island, Cochin- 9, Kerala State, hereinafter called "the Employer" of the one part and .....(Name of Consultant) of .....(Mailing Address of Consultant) hereinafter called the "Consultant" of the other part.

WHEREAS the Employer is desirous that certain tasks to be performed by the Consultant viz. "Providing consultancy services for Quantitative Risk Analysis along with closure report and Environmental Impact Assessment study works in connection with handling Ammonium Nitrate at Q7 berth of Cochin Port" (hereinafter called "The work") and has accepted a Proposal by the Consultant as referred in the assignment **NOW THIS AGREEMENT WITNESSTH AS FOLLOWS:**

1. In this Agreement words and expression shall have the same meanings as are respectively assigned to them in the Conditions of Bid Document hereinafter referred to.
2. The following documents shall be deemed to form and be read and construed as part of this Agreement, viz:
   (a) The Proposal Document for "Providing consultancy services for Quantitative Risk Analysis along with closure report and Environmental Impact Assessment study works in connection with handling Ammonium Nitrate at Q7 berth of Cochin Port".
   (b) All amendments to the Bid documents for "Providing consultancy services for Quantitative Risk Analysis along with closure report and Environmental Impact Assessment study works in connection with handling Ammonium Nitrate at Q7 berth of Cochin Port". in the form of "Addendum" or otherwise as issued by the Employer including queries from Bidders and its reply by the Employer, if any prior to submission of the Bids.
   (c) Qualification, Experience and Team composition submitted as part of The Proposal by the Consultant.
   (d) Lumpsum Consultancy fee quoted as part of Price Bid by the Consultant.
   (e) Acceptance letter issued by the Employer vide No..... dated ..... and all correspondence exchanged between the Employer and the Consultant up to the date of issue of acceptance letter as specifically referred to in the said acceptance/award letter.
3. In consideration of the payment to be made by the Employer to the Consultant as hereinafter mentioned, the Consultant hereby covenants with the Employer to execute and complete the works in conformity in all respects with the provisions of the contract.

4. The Employer hereby covenants to pay the Consultant in consideration of the execution and completion of the works the contract price at the times and in the manner prescribed in the Bid Document and accepted by the Consultant.

IN WITNESS WHEREOF the parties hereto have caused their respective common seals to be hereunto affixed (or have hereunto set their respective hands and seals), the day and year first above written.

SIGNED, SEALED AND DELIVERED

By the said: By the said:

....

Name:..... Name:.....

On behalf of the Consultant in the of :

On behalf of the Employer Presence in the Presence of :

Name :..... Name:.....

Address:..... Address:.....

....

....

****

Appendix-XII

COCHIN PORT AUTHORITY

Providing consultancy services for Quantitative Risk Analysis along with closure report and Environmental Impact Assessment study works in connection with handling Ammonium Nitrate at Q7 berth of Cochin Port

FORMAT FOR FURNISHING BANK INFORMATION FOR e-PAYMENT

1	Name and full address of the beneficiary	
2	Credit Account No. (Should be full 14 digit)	
3	Account Type (SB or CA or OD)	
4	Name of the Bank	
5	Branch (Full address with telephone No.)	
6	MICR code (Should be 9 digit)	
7	Telephone/Mobile/ e-mail id *[2nos]*/ Fax No. of the beneficiary	Telephone : Mobile : e-mail id [2 nos. mandatory]: (i) (ii) Fax :
8	Enclose Cancelled Cheque	(Enclosed / Not Enclosed)

SIGNATURE OF BIDDER

Appendix-XIII

UNDERTAKING FOR FINANCIAL QUOTE

To

The Chief Engineer,
COCHIN PORT AUTHORITY,
Willingdon Island,
Kerala, India.
Pin - 682 009.

Sir,

Sub: **Providing consultancy services for Quantitative Risk Analysis along with closure report and Environmental Impact Assessment study works in connection with handling Ammonium Nitrate at Q7 berth of Cochin Port**

I/We have perused the Bid Documents including the Terms of Reference for the subject assignment and other details and am/are willing to undertake and complete the assignments as per terms and conditions stipulated in the Bid Documents.

Our price offer inclusive of all incidentals, overheads, traveling expenses, stationery, expenditure related to presentations to be made during the execution, sundries/all other expenditure and all taxes, levies and duties but excluding GST, for execution of this assignment covering scope as stipulated in the Bid Document. Our Financial Quote is inclusive of the Domestic Taxes. We hereby confirm that the financial proposal is unconditional and we acknowledge that any condition attached to financial proposal shall result in reject of our financial proposal.

Our financial Proposal shall be binding upon us subject to the modifications resulting from Contract negotiations, up to expiration of the validity period of the Proposal

I/We agree to accept the stage-wise / percentage-wise payment schedule as detailed in **Clause 6.1 of ToR** of the Bid Document.

Yours Sincerely,

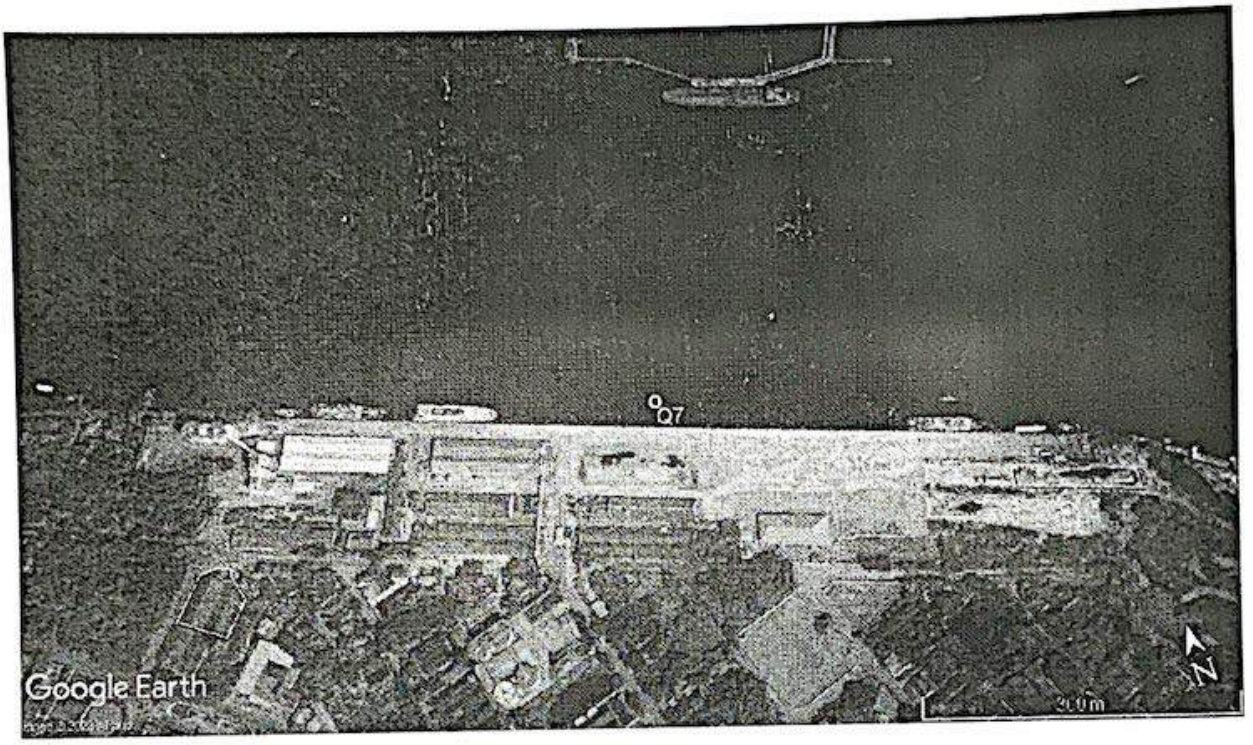
[Authorized Signature [in full and initials]:

[Name and title of Signatory:]

[Name of Firm:]

Address:

***NOTE**: All the payment under this Contract will be made only in Indian Rupees. The fees/price may be quoted in Indian Rupees only.*


Q7
Google Earth
N

Appendix - XIV

FINANCIAL PROPOSAL FOR ASSIGNMENT

Name of Assignment: Providing consultancy services for Quantitative Risk Analysis along with closure report and Environmental Impact Assessment study works in connection with handling Ammonium Nitrate at Q7 berth of Cochin Port

Sl. No.	Description of Assignment	Total Lumpsum charges/Fees in Indian Rupees.)	
1	Providing Consultancy for carrying out Quantitative Risk Analysis along with closure report and Environmental Impact Assessment study works in connection with handling Ammonium Nitrate at Q7 berth of Cochin Port, and other terms and conditions stipulated in the Bid document inclusive of all incidentals, overheads, traveling expenses, stationery, expenditure related to presentations to be made during submission of reports stated under this assignment, sundries / all other expenditure and all taxes, levies and duties but excluding GST.	(in Figures)	(in words)
		(to be submitted in e-tender mode only in schedule II)	***(to be submitted in e-tender mode only schedule II)***

ANNEXURE 5 211

வ.உ.சிதம்பரனார் துறைமுக பொறுப்புக் கழகம்
V.O.CHIDAMBARANAR PORT TRUST
(MINISTRY OF SHIPPING, GOVERNMENT OF INDIA)
ADMINISTRATIVE OFFICE, HARBOUR ESTATE, TUTICORIN 628 004, TAMIL NADU
URL: www.vocport.gov.in

ISO 9001:2015, ISO 14001: 2015 & OHSAS 18001:2007

SAGARMALA
PORT LED PROSPERITY

No.TRA-OFTTI-MIS-MISCE-V1-20(46514)D. Date: 31..10.2020

TRADE NOTICE

Sub: Handling of Ammonium Nitrate at VOCPT – Reg.

VOC Port Trust is pleased to inform the EXIM trade that handling of Ammonium Nitrate at VOCPT shall be carried out conforming to the SOP given in Annexure.

31/10/2020
TRAFFIC MANAGER

Annex: As above

To
1. Tuticorin Ship Agents Association (TSAA)
2. Tuticorin Customs Brokers' Association (TCBA)
3. Tuticorin Stevedores Association (TSA)

Copy To: Sr.DD/EDP with a request to publish in website

Annexure

V.O. CHIDAMBARANAR PORT TRUST

TRAFFIC DEPARTMENT

SOP FOR HANDLING AMMONIUM NITRATE

1. Ammonium Nitrate as notified in the TNPCB only shall be handled in the Port.
2. Owner of the 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" and Ammonium Nitrate Rules, 2012 would be strictly be followed.
3. Valid Insurance Policy under PLI Act, 1991 shall be submitted before berthing by the Agents.
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 will be thoroughly cleaned and dried prior to discharge/receipt of this cargo.
5. Ammonium Nitrate should be handled and delivered during daylight hours only.
6. Strict procedure shall be followed by the Agent for maintaining cleanliness at the berth while handling Ammonium Nitrate to prevent contamination with any reactive substance containing carbonaceous, hydro-carbonaceous material and any other incompatible material.
7. After discharge of the entire cargo, Wharf shall be fully cleaned by the Agent by using non friction/non-abrasive materials.
8. There should not be any spillage however, in case of accidental spillage; it should be dealt as per manufacture's MSDS and MSIHC rules, 1988 and as per Ammonium Nitrate Rules, 2012.

9. The vehicle speed at berth will not be more that 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 the vehicle has not leak any mineral oils.

10. The drivers of the vehicles and cargo moving equipment carrying Ammonium Nitrate will be instructed to ensure no leakage of oil/fuel from the vehicles taken place.

11. 30 meters areas on the berth to be cordoned by plastic barricades/safety cones with reflective rope and to ensure no unauthorized persons are permitted.

12. All workers who are engaged in handling of said cargo shall wear Personal Protective Equipments.

13. Marine Department shall provide Fire fighting facility before berthing and continue till un-berthing of the vessel as requested by the Agent. Berthing and commencement of discharge/loading shall be informed to the Port Fire Officer by the Agent.

14. The Agent 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/loading the said cargo from/to the vessel.

15. Written permission shall be obtained from Chief Controller of Explosives, TNPCB, District Collector, District Magistrate, Superintendent of Police, Commissioner of Customs of Thoothukudi and submitted to the Port Authority.

16. The consignee/owner and vessel's Agent will indemnify the V.O.Chidambaranar 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/loading the said cargo from/to the vessel.

17. A certificate of purity/analysis report issued by the competent authority in the country of manufacture will be produced before discharge of such cargo.

18. The cargo shall be directly delivered to transport medium as per ammonium nitrate rules, 2012 and shall not be permitted to store inside the custom bound area of VOCPT.

19. Welding, burning cutting or other operations like hot works or any other maintenance works at onboard and onshore, Bunkering or pumping of fuel oil will not be permitted till the completion of cargo. 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.

20. 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, Hypochlorite's, 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, sisal, Saw dust etc.)

21. The unloading/loading operation of the said cargo will be carried out under direct supervision of the Master of the vessel till the completion of such operation.

22. The Agent should comply with the rules mentioned in the Column 3 & 4 of schedule 2 and rule 15 & 18 of manufacture storage, import of hazardous chemicals (MSIHC) Rules, 1988 as amended as well as any other rule for transportation of such cargo.

23. The Agent should ensure that the central Motor vehicle rules 1988 framed under the provisions of Motor Vehicle Act, 1988 as amended from time to time and any other rule as applicable for transportation of such cargo.

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

25. The consignee must submit duly filled-in VOC Port's "Undertaking" and "Check list" for handling Ammonium Nitrate in this Port.

****

Annexure 6 216

Standard Operating Procedure for handling of Ammonium Nitrate at Paradip Port Authority (as per provision under Ammonium Nitrate Rules, 2012)

1. Scope:-

Ministry of Ports, Shipping and Waterways vide Gazette Notification No.3298 dated 21.10.2020 has notified Paradip Port for import of Ammonium Nitrate, in bagged form, in India, by sea under rule 6(4)(c) of the Ammonium Nitrate Rules, 2012. Hence, Import of Ammonium Nitrate shall be allowed in bagged form or in containers stuffed with bags, in Paradip Port.

2. Standard Operating Procedure:-

(i) Ammonium Nitrate shall be allowed to be imported only in bagged form or in containers stuffed with bags. Stuffing of bags is allowed in containers at hook point.

(ii) The Importer shall maintain records of Ammonium Nitrate received and dispatched to each importer to ensure accountability, identification and traceability and file returns.

(iii) Each bag of Ammonium Nitrate must have the following information in conspicuous and indelible characters, by means of stamping or painting:-

(a) The word "Ammonium Nitrate"
(b) Purity in percentage
(c) The name, address and license no. of manufacturer and converter or importer.
(d) Identification no. of the package or bar coding.
(e) The net weight of Ammonium Nitrate.
(f) The gross weight of the package.
(g) Date of bagging & batch number.
(h) Name, address, license no. And unique identification number of stevedoring agent (if any).

The bags shall be serially numbered by means of stencilling, bar coding by RFID tags or any other means by the manufacturer or importer prior to landing / immediately after landing prior to delivery.

(iv) The imported Ammonium Nitrate shall be immediately removed from the Port to the Importer's warehouse. The dispatch of bags will be allowed only after observing all formalities as per para (iii) above.

(v) The cargo so loaded onto the trucks/dumpers will be taken delivery of directly from the hook point and removed from the Port premises immediately after landing. No transit storage of cargo inside the Port Prohibited area/Custom bonded area will be allowed. Stuffing of bags is allowed in containers at hook point only. Stuffing/ De-stuffing of cargo inside the Port Prohibited area/Custom bonded area will not be allowed.

Cntd.....2

(vi) Declaration by importer:-

A person holding an import license granted under these rule shall furnish a declaration to the licensing authority and the Chief Controller;

(a) In Form R-3 under part – 3 Schedule II as soon as ship carrying Ammonium Nitrate sails from the port of loading;
(b) In Form R-4 under part-3 of Schedule II as soon as any shipment of Ammonium Nitrate cleared at the port of import.

(vii) Declaration by Master of ship or by the ship's agent:-

(a) the master of every ship carrying Ammonium Nitrate or the agent for such ship shall give the PPA not less than seventy two hours notice of its intended arrival at the Port;
(b) the master of every ship carrying Ammonium Nitrate shall deliver to the pilot before entering PPA, a written declaration in Form C-1, under Part 4 of Schedule II, provided that if in anticipation of a ship's arrival, the agent for such ship delivers to the PFSO/Deputy Conservator,PPA a written declaration as aforesaid under his signature, no such declaration need to be made by master of the ship;
(c) Every declaration delivered to a pilot under clause (b) as above shall be made over by master without delay to the PPA and all declarations received by the PPA shall be forwarded by master, with all convenient dispatch to Paradip Customs.

(viii) Restriction of Transport:-

(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.

(ix) Restriction on delivery or dispatch:-

(a) No person shall deliver or dispatch Ammonium Nitrate to anyone other than a person who
    (1) Is the holder of a license to possess the Ammonium Nitrate or the agent of a holder of such a license duly authorized by him in writing on his behalf or
    (2) Is entitled under these rules to possess the Ammonium Nitrate without a license.
(b) The Ammonium Nitrate so delivered or dispatched shall in no case exceed the quantity at any point of time for which the person is holding a license under these Rules.
(c) No person shall receive Ammonium Nitrate from any person other than the holder of a license under these Rules.

Cntd.....3

(x) Restriction on handling Ammonium Nitrate:-

No person shall handle or cause to be handled any Ammonium Nitrate between the hours of sunset and sunrise:

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.

(xi) 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 manufacture, conversation, bagging, storage, sale, loading, unloading or transport of Ammonium Nitrate or to enter any premises permitted under these rules.

(xii) 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 or 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 manufacture, conversation, bagging, storage, import, export, transport or handling of Ammonium Nitrate.

(xiii) Restriction on use:-

All operations associated with stevedoring, bagging, handling, transport and use of Ammonium Nitrate in any building or part thereof shall be carried out under the supervision of a person employed by the license holder who is conversant with the process thereof and the hazard connected therewith and the provisions of these Rules.

(xiii) Recovery of spillage during handling:-

If any spillage occurs during the process of handling of Ammonium Nitrate 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.

(xiv) In the event of spillage of this cargo, such spillage should not be rolled over by weight or any such method under any circumstances. Spillage of this cargo, if any, should be immediately swept out separately and cleared away immediately by your responsible competent person in consultation with the Vessel Agent and Stevedore.

Cntd.....4

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(xv) Ship's fire-fighting appliances on-board the vessel should be kept in readiness at all times to any emergency. Adequate supplies of water for fighting purposes should be immediately available from the fire hydrant/main whenever this material is on-board. In case this cannot be supplied by the ship's pumps it should be augmented to the required quantity by means of portable pumps. Fire-fighting personnel should be present during the entire period of unloading/handling and delivery of the said cargo from the dock area.

(xvi) The unloading, handling and delivery operation of the said cargo are to be carried out under direct supervision of 'Competent Person' from the Importer as well as the Vessel Agent side as they will be jointly and severally responsible for any lapses or mishaps. Further, the Importer shall submit, shift-wise, the details of the Competent Person and a list of personnel being deployed at General Cargo Berth (GCB) office before commencement of each shift.

(xvii) The Importer and Vessel Agent should indemnify the PPA for any damage/injury to the Port's properly, personnel etc. or even any liabilities arising out or damage to third party during the time of unloading, handling and delivery of the said cargo at/from the dock area. A liability may arise by or arising due to the entry of vessel into the Port till the vessel completely leaves the Port for beginning of another transaction. The liability in respect of each and every act of the import of Ammonium Nitrate till it is totally free from this transaction shall be made good by means of an indemnity bond by the Importer/Vessel Agent of the vessel. Format of the indemnity bond is enclosed as **Annexure-A** and **Annexure-B**.

(xviii) The cargo so loaded onto the trucks/lorries/dumpers will be taken delivery of directly from the hook point and removed from the Port premises immediately after landing. No transit storage of cargo inside the dock will be allowed. The deputed agents/agencies will keep all arrangements ready accordingly. No stuffing and de-stuffing of cargo is permitted. Stuffing of bags is allowed in containers at hook point only.

(xix) The deputed agents/agencies should ensure that the wharf is fully cleaned and that no spillage whatsoever is left on the wharf after completion of discharge of the vessel.

(xx) The license holder shall submit monthly returns of Ammonium Nitrate manufactures, converted, stevedored, received, sold, transported, used, destroyed or imported or exported to the license issuing Authority, the District Magistrate and Superintendent of Police in the form specified in Para 3 of Schedule II so as to reach the above authority on or before the tenth day of every succeeding month.

(xxi) The license holder shall maintain record and make transaction and file returns by electronic means when directed by the license issuing authority or the Central Government.

Cntd.....5

(xxii) In case of any accident, loss, or theft of Ammonium Nitrate, License Holder should take necessary action as per sections 52 and 53 of Ammonium Nitrate Rules, 2012. A copy of the report shall also be submitted to Traffic Manager, PPA.

(xxiii) The Vessel Agent will inform the Safety Officer,PPA and PFSO/Deputy Conservator,PPA regarding arrival of the vessel, berthing of the vessel, commencement of discharge of the cargo, completion of discharge of the cargo and sailing of the vessel.

(xxiv) The Importer and Vessel Agent will inform Inspector of Dock Safety regarding import consignment of Ammonium Nitrate and obtain an acknowledgement of receipt of the same.

(xxv) The vessel agent shall place requisition with the Port well in advance for deployment of Port fire service during handling the cargo and applicable charges will be duly paid.

(xxvi) An Undertaking shall be submitted by the Importer that the said cargo is well within the stipulated conditions and standards as per Environment Protection Act, 1986. All the relevant provisions of "Manufacturing, Storage & Import of Hazardous Chemicals (MSIHC) Rules 1989" would be followed. All the rules/regulations/instructions/procedures/acts etc would be followed without any deviation. Any amendments to the applicable rules/ regulations/ instructions/ procedures/ acts etc would be followed. Safety norms and procedures will be strictly complied by all the parties involved in Import of Ammonium Nitrate.

(xxvii) Agent of Vessel carrying Ammonium Nitrate for import shall submit necessary information as prescribed in '**Form-A**' (enclosed as **Annexure-C**) atleast 3 (three) clear working days, in quadruplicate, prior to the arrival of the vessel to the PFSO/Deputy Conservator,PPA. If found satisfactory, Form-A will be endorsed by the PFSO/Deputy Conservator,PPA. After endorsement, the first copy will be retained by the PFSO/Deputy Conservator,PPA, the Vessel Agent will submit the second copy to Traffic Manager,PPA and the third copy to Stevedore appointed by the Importer and the fourth copy will be retained by the Vessel Agent.

(xxviii) The vessel agent as well as the License Holder shall keep necessary arrangements in place for meeting any emergency or accident which may occur during cargo transfer on board and ashore. The stevedore shall ensure use of appropriate Personal Protective Equipment, spark proof/friction proof tools, cargo moving equipment and lifting appliances etc. Welding, burning, cutting or other operation involving the use of fire, open flame, spark or arc welding is strictly prohibited on board the vessel and in the vicinity of operation during the handling of Ammonium Nitrate. Master of vessel shall ensure that lifting appliances of the vessel under his command are in good condition and these are properly certified.

Cntd.....6

(xxix) The Vessel Agent/Stevedore/Importer will be required to furnish the documents listed below, prior to declaration of vessel/after completion of discharge, wherever applicable, to PPA. Notwithstanding to the below documents, the Importer should ensure that the other required documents, if any, shall be submitted by the parties involved in Import of Ammonium Nitrate to PPA.

Sl.No.	Name of the Document	To be submitted by
1	Relaxation of provisions of Merchant Shipping (Regulation of Entry of Ships into Ports, Anchorage & Offshore Facilities)Rules, 2012 issued by Ministry of Ports, Shipping and Waterways, GOI.	Vessel Agent
2	Copy of valid License obtained from Licensing Authority as per Sr. No. 2, 4 & 5 of schedule I of Ammonium Nitrate Rules 2012 for transport and import of Ammonium Nitrate (As per License Form P-2, P-4 & P-5 of Ammonium Nitrate Rules, 2012).	Stevedore/ Transporter/ Importer
3	Copy of Commercial Invoice, Packing List, Bill of Lading, IGM for every consignment.	Importer
4	Certificate of Cargo Analysis, specification etc. as per Rule No.9 of Ammonium Nitrate Rules, 2012.	Importer
5	Copy of intimation submitted by the Consignor to the Superintendent of Police at the place of dispatch as well as at the place of receipt as per Form R-11 (a) of Part-3 of Schedule-II in terms of Rule No.20(3) of Ammonium Nitrate Rules, 2012.	Importer
6	Clearance of Odisha State Pollution Control Board	Importer
7	Indemnity Bond to Indemnify PPA, as per format enclosed at **Annexure-A and Annexure-B**	Importer & Vessel Agent
8	Undertaking that the said cargo is well within the stipulated conditions and standards as per Environment Protection Act, 1986. All the relevant provisions of "Manufacturing, Storage & Import of Hazardous Chemicals (MSIHC) Rules 1989" would be followed. All the rules/ regulations/ instructions/ procedures/acts etc would be followed without any deviation. Any amendments to the applicable rules/ regulations/ instructions/ procedures/ acts etc would be followed. Safety norms and procedures will be strictly complied by all the parties involved in Import of Ammonium Nitrate.	Importer & Vessel Agent
9	Public Liability Insurance Risk Certificate	Importer
10	Material Safety Data Sheet (MSDS)	Importer
11	Declaration from the Importer for purpose & use of the cargo imported	Importer
12	Explosive manufacturing license of the Importer issued by Jt. Chief Controller of Explosives, Petroleum & Explosives Safety Organization, GOI	Importer
13	Compliance of Sub Regulation (1) of Regulation 76 of Dock Workers (Safety, Health & Welfare) Rules, 1990	Vessel Agent
14	Marine Cargo (Specific Voyage) Policy	Importer or Vessel Agent
15	Copy of the declaration in Form: R-3 under Part-3 of Schedule-II as specified under Rule No.18 (4)(a) of "Ammonium Nitrate Rules, 2012" along with a copy of license submitted to the Chief Controller of Explosives and Licensing Authority.	Importer
16	Copy of the declaration in Form: R-4 under Part-3 of the Schedule-II as specified under Rule No.18(4)(b) of "Ammonium Nitrate Rules, 2012" and submitted to the Chief Controller of Explosives and Licensing Authority.	Importer

Annexure-A

Format for Indemnity Bond to be submitted by the Importer
(Submit on Stamp paper of value not less than Rs.100/-)

This deed of indemnity is made by ....., having its Registered Office at ..... (hereinafter referred to as the Importer which expression shall unless repugnance to the condition or meaning there of include its heirs, successors, legal Representatives and executors) in favour of the Board of Paradip Port Authority having its office at Paradip Port Authority, Administrative Building, Paradip - 754142 (herein after called as Board) WHEREAS THE IMPORTER have requested the Board for import of Ammonium Nitrate.

AND WHEREAS necessary permission from all the concerned authorities including Odisha State Pollution Control were taken for importing Ammonium Nitrate.

NOW THIS INDENTURE WITNESSETH THAT THE IMPORTER agrees and undertakes that they will indemnify and keep the Board indemnified if suffered directly or indirectly towards handling of import of Ammonium Nitrate.

The Importer further agrees to indemnity and keep the Board indemnified against any/all claims/demands/actions/deamager/recoveries/judgements/costs/charges and expenses which may be made or brought or commenced against the Board or which the Board may/may have to bear, pay or suffer directly or indirectly on account of such import of Ammonium Nitrate. The Importer further agrees to indemnify Board and its employees against all consequences that may arise out of third party loss/damage/injury/death etc towards of handling of import of Ammonium Nitrate.

The Importer also agrees to indemnify and keep the Board indemnified against any liability/loss claim that may arise owing to environment pollution as a result of handling of import of Ammonium Nitrate within the conservancy jurisdiction of the Port of Paradip and undertake to bear all expenses/penal action as result of environmental pollution consistent with all loses with the territory of India.

A liability may arise by or arising due to the entry of vessel into the Port till the vessel completely leaves the Port for beginning of another transaction. The liability in respect of each and every act of the import of Ammonium Nitrate till it is totally free from this transaction shall be made good by the Importer.

SIGNED, SEALED AND DELIVERED

Witness: 1)

2)

Annexure-B

Format for Indemnity Bond to be submitted by the Vessel Agent
(Submit on Stamp paper of value not less than Rs.100/-)

This deed of indemnity is made by ....., having its Registered Office at ....., who have been duly authorised by the OWNERS/CHARTERERS of the vessel..... to execute this Bond on his/their behalf (hereinafter referred to as the Agent which expression shall unless repugnant to the condition or meaning thereof include its heirs, successors, legal representatives and executors) in favour of the Board of Paradip Port Authority having its office at Paradip Port Authority, Administrative Building, Paradip - 754142 (herein after called as Board). And that I/We have been duly authorised by the OWNER of the vessel to execute this Bond on their behalf.

WHEREAS, I/We, the Agent/Agents representative of the OWNER of the vessel have requested the Board for Import of Ammonium Nitrate.

NOW THIS INDENTURE WITNESSETH that I/We, the Agent on behalf of the OWNER of the vessel agree and undertake that we will indemnify and keep Board indemnified against any/all loss/ liability/ injury that the Board may suffer towards Import of Ammonium Nitrate.

I/We, Agent on behalf of the OWNERS of the vessel further agree to indemnify and keep the Board indemnified against any/all claims/ demands/ actions/ proceedings/ damages/ recoveries/ judgements/ costs/ charges and expenses which may be made or brought or commenced against the Board or which the Board may have to bear, pay or suffer directly or indirectly on account of such import of Ammonium Nitrate. I/We, further agree to indemnify the Board and its employees against all consequences that may arise out of third party loss/damage/injury/death etc. towards of handling of import of Ammonium Nitrate.

I/We, the Agent also agrees to indemnify and keep the Board indemnified against any liability/loss claim that may arise owing to environment pollution as a result of handling of import of Ammonium Nitrate within the conservancy jurisdiction of the Port of Paradip and undertake to bear all expenses/penal action as result of environmental pollution consistent with all loses with the territory of India.

A liability may arise by or arising due to the entry of vessel into the Port till the vessel completely leaves the Port for beginning of another transaction. The liability in respect of each and every act of the import of Ammonium Nitrate till it is totally free from this transaction shall be made good by the Agent.

SIGNED, SEALED AND DELIVERED

Witness: 1)

2)

Annexure-C

TO BE SUBMITTED BY VESSEL AGENT
FORM (A)

PARADIP PORT AUTHORITY

(In terms of sub-Regulation (1) of Regulation-76 of Dock Workers (Safety, Health, Welfare) Regulation, 1990).

(Special Notice for Dangerous and Hazardous Goods)

Name of the Vessel :
VCN No. :
Vessel Agent :

Voyage No. :
Date of Entry with Customs:
Expected date of Arrival (ETA):

Sl. No.	Mrks and No. of bags/ Cont. No.	No. of Packages	Quantity Gr.Wt/Net Wt.(Kgs)	IMDG Code (Class)	UN No.	Chemical Name	Name of Importer	Name of MLO	Stowage	Remarks
1	2	3	4	5	6	7	8	9	10	11

[Signature of Vessel's Agent with Office Seal]

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Annexure J

Ammonium Nitrate Import Raises Concern

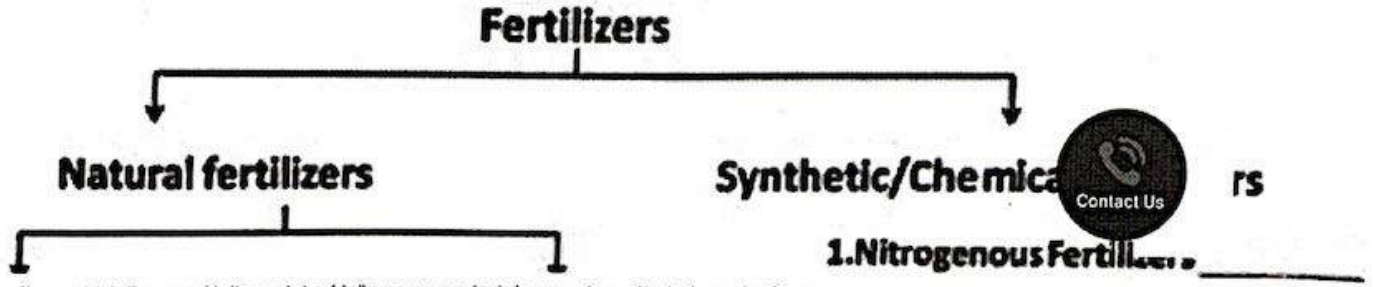
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Tags: *Rapid Fire CA* *Quick Facts For Prelims* *Agricultural Resources* *Mobilization of Resources* *Direct & Indirect Farm Subsidies*

Source: TH

The sharp rise in **ammonium nitrate (AN)** imports from **Russia** has raised concerns for India's domestic fertiliser industry, which faces competition from cheaper imports.

- Indian fertiliser companies are investing over Rs 4,000 crore to boost AN capacity, vital for mining coal, iron ore, and limestone.
- **Ammonium Nitrate (AN):**
  - **Ammonium Nitrate (NH_4NO_3)** is the **nitrate salt of the ammonium ion**, consisting of ammonia and nitric acid. It is a **white crystalline solid** highly soluble in water.
  - **Uses:**
    - **Fertiliser:** Its high nitrogen content makes it extensively used in agriculture.
    - **Explosives:** Mixed with fuel oil to produce **Ammonium Nitrate Fuel Oil (ANFO)**, commonly employed in mining and demolition.
    - **Cold Packs:** These are found in instant cold packs and are useful for injury treatment.
    - **Matches:** AN is used in safety matches.
- **About the Fertilizer Industry in India:**
  - **India is the world's second-largest consumer of urea**, after China, and the second-largest producer of nitrogenous fertilisers
  - The **fertiliser Industry is** one of the **8 core industries** in India.
  - It receives the **second-largest subsidy**, after food.
  - India meets 100% of its **potash requirement through imports** from countries like **Belarus, Russia, Israel, and Jordan**.



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Gypsum
Crushed Lime Stones
Sulphur rock Phosphates



Manure & Composts
Animal excreta
Plant Waste
Humus
Vermicompost
Blood meal
Bone meal
Fish meal



Ammonium Sulphate
Sodium Nitrate
Potassium Nitrate
Calcium Ammonium Nitrate

2. Phosphatic Fertilizers
Rock Phosphate
Super Phosphates
Phosphoric Acid
Diammonium Phosphate

3. Potassic Fertilizers
Muriate of Potash
Sulphate of Potash
Potassium Nitrate
Potassium metaphosphate

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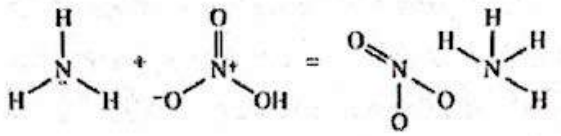
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ANNEXURE 8



ammonia (NH3) + nitric acid (HNO3) = ammonium nitrate (NH4NO3)

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ammonium nitrate Structure of the chemical compound ammonium nitrate, from which fertilizer is produced.

ammonium nitrate

chemical compound

Actions

Written and fact-checked by The Editors of Encyclopaedia Britannica
Last Updated: Oct 9, 2024 • Article History

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Related Topics: ammonia • nitrate • ANFO • extra dynamite

On the Web: American Meteorological Society - Journal of the Atmospheric Sciences - On the Decomposition of Ammonium Nitrate in the Atmosphere (Oct. 09, 2024) ...*(Show more)*

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ammonium nitrate, (NH_4NO_3), a salt of ammonia and nitric acid, used widely in fertilizers and explosives. The commercial grade contains about 33.5 percent nitrogen, all of which is in forms utilizable by plants; it is the most common nitrogenous component of artificial fertilizers. Ammonium nitrate also is employed to modify the detonation rate of other explosives, such as nitroglycerin in the so-called ammonia dynamites, or as an oxidizing agent in the ammonals, which are mixtures of ammonium nitrate and powdered aluminum.

Ammonium nitrate is a colourless crystalline substance (melting point 169.6 °C [337.3 °F]). It is highly soluble in water; heating of the water solution decomposes the salt to nitrous oxide (laughing gas). Because solid ammonium nitrate can undergo explosive decomposition when heated in a confined space, government regulations have been imposed on its shipment and storage.

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The Editors of Encyclopaedia Britannica

This article was most recently revised and updated by Adam Augustyn.

explosive

chemical product

Written by Norman Gardner Johnson
Fact-checked by The Editors of Encyclopaedia Britannica
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Key People: Alfred Nobel • Pierre Samuel du Pont • Hudson Maxim • Sir James Dewar • Pierre-Eugène-Marcellin Berthelot ...(Show more)

Related Topics: gunpowder • pyrotechnics • mechanical explosive • high explosive • low explosive

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News • Evacuations Continue Over Suspected Large Batch of Explosives in Tennessee • Oct. 11, 2024, 11:38 PM ET (Newsweek)

explosive, any substance or device that can be made to produce a volume of rapidly expanding gas in an extremely brief period. There are three fundamental types: mechanical, nuclear, and chemical. A mechanical explosive is one that depends on a physical reaction, such as overloading a container with compressed air. Such a device has some application in mining, where the release of gas from chemical explosives may be undesirable, but otherwise is very little used. A nuclear explosive is one in which a sustained nuclear reaction can be made to take place with almost instant rapidity, releasing large amounts of energy. Experimentation has been carried on with nuclear explosives for possible petroleum extraction purposes. This article is concerned with chemical explosives, which account for virtually all explosive applications in engineering.

Types of chemical explosives

Basically, chemical explosives are of two types: (1) detonating, or high, explosives and (2) deflagrating, or low, explosives. Detonating explosives, such as TNT and dynamite, are characterized by extremely rapid decomposition and development of high pressure, whereas deflagrating explosives, such as black and smokeless powders, involve merely fast burning and produce relatively low pressures. Under certain conditions, such as the use of large quantities and a high degree of confinement, some normally deflagrating explosives can be caused to detonate.

Detonating explosives are usually subdivided into two categories, primary and secondary. Primary explosives detonate by ignition from some source such as flame, spark, impact, or other means that will produce heat of sufficient magnitude. Secondary explosives require a detonator and, in some cases, a supplementary booster. A few explosives can be both primary and secondary depending on the conditions of use.

Black powder

History of black powder

It may never be known with certainty who invented the first explosive, black powder, which is a mixture of saltpetre (potassium nitrate), sulfur, and charcoal (carbon). The consensus is that it originated in China in the 10th century, but that its use there was almost exclusively in fireworks and signals. It is possible that the Chinese also used black powder in bombs for military purposes, and there is written record that in the mid-13th century they put it in bamboo tubes to propel stone projectiles.

There is, however, some evidence that the Arabs invented black powder. By about 1300, certainly, they had developed the first real gun, a bamboo tube reinforced with iron, which used a charge of black powder to fire an arrow.

A strong case can also be made that black powder was discovered by the English medieval scholar Roger Bacon, who wrote explicit instructions for its preparation in 1242, in the strange form of a Latin anagram, difficult to decipher. But Bacon read Arabic, and it is possible that he got his knowledge from Arabic sources.

Some scholars attribute the invention of firearms to an early 14th-century German monk named Berthold Schwarz. In any case they are frequently mentioned in 14th-century manuscripts from many countries, and there is a record of the shipment of guns and powder from Ghent to England in 1314.

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Not until the 17th century was black powder used for peaceful purposes. There is a doubtful claim that it was used in mining operations in Germany in 1613 and fairly authentic evidence that it was employed in the mines of Schemnitz, Hungary (modern Banská Štiavnica, Czechoslovakia), in 1627. For various reasons, such as high cost, lack of suitable boring implements, and fear of roof collapse, the use of black powder in mining did not spread rapidly, though it was widely accepted by 1700. The first application in civil engineering was in the Malpas Tunnel of the Canal du Midi in France in 1679.

For 300 years the unvarying composition of black powder has been approximately 75 percent saltpetre (potassium nitrate), 15 percent charcoal, and 10 percent sulfur. The saltpetre was originally extracted from compost piles and animal wastes. Deposits found in India provided a source for many years. During the 1850s tremendous quantities of sodium nitrate were discovered in Chile, and saltpetre was formed by reaction with potassium chloride, of which there was a plentiful supply.

Chilean nitrate was not at first considered satisfactory for the manufacture of black powder because it too readily absorbed moisture. Lammot du Pont, an American industrialist, solved this problem and started making sodium nitrate powder in 1858. It became popular in a short time because, although it did not produce as high a quality explosive as potassium nitrate, it was suitable for most mining and construction applications and was much less expensive. To distinguish between them, the potassium nitrate and sodium nitrate versions came to be known as A and B blasting powder respectively. The A powder continued in use for special purposes that required its higher quality, principally for firearms, military devices, and safety fuses.

Manufacture of black powder

Manufacture of black powder was accomplished originally by hand methods. Ingredients were ground together with a mortar and pestle. The next step was to use crushing devices of wood (wooden stamps), also operated by hand, in wooden or stone bowls. The stamping process was gradually mechanized and, about 1435, the first powder mill driven by water power was erected near Nuremberg, Germany.

Metallic crushing devices, introduced in the early 1800s, slowly and steadily replaced the wooden stamp mills.

In the modern process, charcoal and sulfur are placed in a hollow drum along with heavy steel balls. As the drum rotates, the steel balls pulverize the contents; this device is called a ball mill. The saltpetre is crushed separately by heavy steel rollers. Next, a mixture of several hundred pounds of saltpetre, charcoal, and sulfur is placed in a heavy iron device shaped like a cooking pan. There it is continuously turned over by devices called plows, then ground and mixed by two rotating iron wheels, which weigh from 10 to 12 tons each. The process takes several hours; water is added periodically to keep the mixture moist.

The product of the mills is next put through wooden rolls to break up the larger lumps and is then formed into cakes under high pressure—namely, from about 210 to 280 kilograms per square centimetre (3,000 to 4,000 pounds per square inch) of pressure. Coarse-toothed rolls crack the cakes into manageable pieces and the corning mill, which contains rolls of several different dimensions, reduces them to the sizes desired.

Glazing (the next operation) consists of tumbling the grains for several hours in large wooden cylinders, during which friction rounds off the corners, and, aided by forced air circulation, brings the powder to a specified moisture content. The term glazing derives from the fact that graphite is added during this process, forming a thin film over the individual powder grains. Glazed powder flows more readily than unglazed powder and is more moisture resistant.

After glazing, the powder is graded by sieves into different sizes and packaged, usually in kegs.

Because the burning of black powder is a surface phenomenon, a fine granulation burns faster than a coarse one. Grain sizes are designated as F, 2F, etc., up to 7F, which is the finest, and from C up as the grains become larger. For the A powder the letter indicating the fineness becomes 3FA, etc., and if the powder is glazed, this is followed by the letter *g*—*e.g.*, 3FAg. For many years the B blasting material was offered in pellet as well as granular form. Four pellets, each 5 centimetres (2 inches) in length and from 2.75 to 6.25 centimetres (1.1 to 2.5 inches) in diameter, were packed in waxed paper cartridges. Each pellet had a hole through its centre to accommodate a safety fuse or an electric device used to ignite the powder. Pelleted powder was used almost entirely in underground coal mines, but now regulations generally prohibit both it and the granular type.

Ignition of black powder

Black powder is relatively insensitive to shock and friction and must be ignited by flame or heat. In the early days such devices as torches, glowing tinder, and heated iron rods were used to ignite the powder and, in most cases, a train of the powder was led to the main charge in order to give the firer time to get to a safe place.

In cannons a small touchhole was drilled into the breech and filled with fine powder. Ignition of the charge was usually by means of a slow-burning punk. The same principle was employed in flintlock muskets and rifles except that ignition resulted from sparks produced by contact between flint and steel.

Percussion methods of firing guns have long been in universal use. In the most common procedure, pulling the trigger releases a hammer, which strikes an impact-sensitive explosive mixture. This explosion then ignites the black powder or other powder charge.

Some black powder is still used as the propellant in guns in spite of the superiority of smokeless powder. Besides antique gun experts, who employ it mostly with hand-loaded shells and cartridges, hunters in South and Central America still use guns that require black powder.

In mining, a succession of crude means for ignition (fuses) included straws filled with pulverized black powder, reeds in which the pith was scooped out and replaced with a paste of powder and water (later bound with string and dried), or powder paste spread on wool threads. All of these fuses were ignited either by a piece of wool yarn impregnated with sulfur, called a sulfur mannikin, or some equivalent slow-burning device. A later, and extremely popular, type of fuse was formed of goose quills. The quills were cut so that they could be inserted one into the other and then filled with powder. Quill fuses could be ignited directly, that is, without any delaying element such as the sulfur mannikin. Unfortunately, their reliability was not high, and they often burned erratically.

Safety fuse

A major contributor to progress in the use of explosives was William Bickford, a leather merchant who lived in the tin-mining district of Cornwall, England. Familiar with the frequency of accidents in the mines and the fact that many of them were caused by deficiencies inherent in the quill fuse, Bickford sought to devise an improvement. In 1831 he conceived the safety fuse: a core of black powder tightly wrapped in textiles, one of the most important of which was jute yarn. The present-day version is not very different from the original model. The cord is coated with a waterproofing agent, such as asphalt, and is covered with either textile or plastic.

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The safety fuse provided a dependable means for conveying flame to the charge. Its timing (the time required for a given length to burn) was amazingly accurate and consistent, compared to that of its predecessors, and it was much better from the standpoints of resistance to water and abuse.

Underground coal mining was formerly by far the largest consumer of black powder. From a performance standpoint, it is probably the best explosive for that purpose. Its relatively gentle, heaving action gives a high yield of lump and leaves the coal in good position for rapid loading. Before the advent of oil, gas, and electric heating and cooking, coal was produced in tremendous quantities for household use and lump demanded a premium price. But black powder has a dangerous tendency to ignite coal gas (mostly methane) and coal dust, and many mine explosions occurred. About 1880 several European governments, seeking to develop safer substitutes for black powder, set up testing stations. Similar action was taken in the United States a few years later. The result was a series of special dynamites approved for use in gassy and dusty coal mines when used in the specified manner. Their blasting action was not as good as that of black powder, but they were much safer. These dynamites are discussed below.

The use of black powder in underground coal mines is no longer allowed in most countries. As a result, black powder production has decreased tremendously. Further, black powder is now more expensive than dynamite and is used only for special purposes. There is, for example, no substitute for black powder in certain military applications, and nothing equal to it has yet been found for the manufacture of the safety fuse. The fact that black powder is relatively nonshattering is of value in blasting certain types of stone.

Nitroglycerin

Nitroglycerin, another chemical explosive, was discovered by an Italian chemist, Ascanio Sobrero, in 1846. Although he first called it pyroglycerin, it soon came to be known generally as nitroglycerin, or blasting oil. Because of the risks inherent in its manufacture and the lack of dependable means for its detonation, nitroglycerin was largely a laboratory curiosity until Immanuel Nobel and his son Alfred made extensive studies of its commercial potential in the years 1859–61. In 1862 they built a crude plant at Heleneborg, Sweden; Alfred, a chemist, was basically responsible for the design of this factory that was efficient and relatively safe considering the state of knowledge of the times. Nevertheless, it exploded in 1864 and killed, among others, Alfred's youngest brother Emil Oskar. Although deeply affected by the accident, Alfred continued work, at first on a barge that he moored in the middle of a lake. In 1865 he erected a plant at Krümmel, Germany, and another in Sweden at Vinterviken near Stockholm. A third plant was built a year later in Norway. Nobel was granted a

patent for the manufacture and use of nitroglycerin in the United States, in 1866, and since importation on a large scale was impractical, he visited the United States in an effort to interest local capital. The victim of a number of unscrupulous businessmen, he finally sold his American holdings in 1885 for only $20,000.

Even today most experts regard Nobel's invention of the blasting cap, a device for detonating explosives, in 1865, as the greatest advance in the science of explosives since the discovery of black powder. Combined with Bickford's safety fuse, the blasting cap provided a dependable means for detonating nitroglycerin and the many other high explosives that followed it. After a number of attempts that were only partially successful, Nobel settled on a charge of mercury fulminate, which had been known for many years, in a copper capsule. With one or two minor changes, this blasting cap remained in general use until the 1920s.

Dynamite

The second most important of Nobel's inventions was dynamite, in 1867. He coined the name from the Greek *dynamis,* "power." The basis for the invention was his discovery that kieselguhr, a porous siliceous earth, would absorb large quantities of nitroglycerin, giving a product that was much safer to handle and easier to use than nitroglycerin alone.

Dynamite No. 1, as Nobel called it, was 75 percent nitroglycerin and 25 percent guhr. Shortly after its invention, Nobel realized that guhr, an inert substance, not only contributed nothing to the power of the explosive but actually detracted from it because it absorbed heat that otherwise would have improved the blasting action. He turned, therefore, to active ingredients such as wood pulp for an absorbent and sodium nitrate for an oxidizing agent. By varying the ratio of nitroglycerin to these "dopes," as they came to be called, Nobel not only improved the efficiency of dynamite but also was able to prepare it in varying strengths, termed straight dynamites. Thus 40 percent straight dynamite contained 40 percent nitroglycerin and 60 percent dope.

Nobel patented the use of active ingredients in dynamite in 1869. Several others obtained similar patents at about the same time, however, and the result was that no one could establish a clear-cut claim to the invention.

Nobel's next outstanding contribution was his invention of gelatinous dynamites in 1875. There is a legend that he hurt a finger and used collodion, a solution of relatively low nitrogen content nitrocellulose in a mixture of ether and alcohol, to cover the wound. Later, unable to sleep because of the pain, Nobel went to the laboratory to find out what effect collodion would have on nitroglycerin. To his great satisfaction, he found that after evaporation of the solvents, there remained a tough,

plastic material. He discovered that he could duplicate this by the direct addition of 7 to 8 percent of collodion-type nitrocotton to nitroglycerin and that lesser quantities of nitrocotton decreased the viscosity and enabled him to add other active ingredients. He called the original material *blasting gelatin* and the dope mixtures *gelatin dynamites*. The principal advantages of these products were their high water resistance and greater blasting action power than the comparable dynamites. This added power resulted from a combination of higher density and a degree of plasticity that allowed complete filling of the borehole (the hole that was bored in the coal seam or elsewhere for implantation of the explosive).

The first large-scale manufacture of nitroglycerin in the United States is attributed to George Mowbray, a chemist of considerable ability who had followed the work of Sobrero and others in Europe with great interest. Mowbray published an advertisement offering to supply nitroglycerin. This led to an invitation to manufacture it for completion of the Hoosac Tunnel at North Adams, Massachusetts. Mowbray's plant was built near North Adams in the latter part of 1867. Most of its product went to the tunnel, but a substantial amount was shipped, frozen, throughout the eastern United States and Canada. Pure nitroglycerin, relatively insensitive in frozen form, freezes at about 11° C (52° F) and is, therefore, easy to keep frozen by packing it in ice. Before closing his plant down because of patent difficulties, Mowbray made about 450,000 kilograms (1,000,000 pounds) of nitroglycerin without accidents in either manufacture or shipment.

One of the earliest major uses of nitroglycerin in the United States was in blasting oil wells to increase the flow of oil. E.A.L. Roberts in that country obtained a patent covering this procedure and later acquired the right to manufacture and use nitroglycerin under the Nobel patents. Theoretically, this gave him a monopoly on shooting oil wells, and his company dominated the field, but many of his competitors ignored his patent rights.

After 1883 the use of nitroglycerin was, with a few unimportant exceptions, restricted to oil-well shooting. In recent years more efficient means have been developed for increasing oil flow. Nitroglycerin is still used occasionally because it is more economical in small wells.

Three tunnels stand out as benchmarks in the history of the use of explosives: first is Mont Cenis, a 13-kilometre (8-mile) railway tunnel driven through the Alps between France and Italy in 1857–71, much the largest construction job with black powder up to that time; second was the 6.4-kilometre (4-mile) Hoosac, also a railway project, during the construction of which (1855–66) nitroglycerin first replaced black powder in large-scale construction; third was the Sutro mine development tunnel in Nevada

(1864–74) where the switch from nitroglycerin to dynamite for this type of work started.

Ammonium nitrate

After the straight dynamites and gelatins, the next important advance in dynamite was the substitution of ammonium nitrate for part of the nitroglycerin to give a safer and less expensive product. The use of ammonium nitrate in explosives had been patented by others in Sweden in 1867, but it was Nobel who made the new "extra dynamites" successful by devising gelatins that contained from 20 to 60 percent ammonium nitrate.

During the period 1867–84, many people worked to develop nongelatinous ammonium nitrate mixtures, but nothing of value resulted, largely because ammonium nitrate is too hygroscopic; that is, it picks up moisture too readily. In 1885 R.S. Penniman, an American, found a solution to the problem by coating the ammonium nitrate with a small percentage of paraffin, or some similar substance, prior to use. With this development a series of ammonia dynamites soon became popular. Coating was discontinued when other, safer means were developed to handle the moisture problem.

All major underground-coal-mining countries have similar explosives and regulations. In the United States explosives that have been approved by the U.S. Bureau of Mines for use in underground coal mines are called permissibles. Besides passing the Bureau's safety tests, these explosives must be used in a manner specified by the Bureau. In England the explosives are known as permitted; in France, *explosifs antigrisouteux;* in Belgium, *explosifs S. G. P.* (*sécurité, grisou, poussière*); and in Germany, *schlagwettersichere Sprengstoffe*. Almost without exception the major ingredient in these explosives is ammonium nitrate, chosen because of its low explosion temperature, and nearly all of them contain a cooling agent such as sodium chloride (common salt) or ammonium chloride to prevent the heat of their explosion in a mine from igniting underground gases such as methane, or a combination of them and coal dust, and causing a fire or disastrous secondary explosion. The sensitizer is usually a small amount of nitroglycerin, but in some cases it is TNT, trinitrotoluene (discussed later); for example, it is said that a typical Russian permissible would be 68 percent ammonium nitrate, 10 TNT, 20 sodium chloride, and 2 powdered bark.

As synthetic ammonia became less expensive because of improvements in manufacture and a raw material change from coal to natural gas, the explosives industry concentrated its efforts on substituting ammonium nitrate for nitroglycerin. Two important products were (1) low-density ammonia dynamites and (2)

semigelatins. Prior to their development, the density of most dynamites was about the same and was quite high. Strength was changed in the different grades by varying the amount of explosives used. The new concept was to employ the strongest formula possible, with a minimum of nitroglycerin and a maximum of ammonium nitrate, and to dilute it systematically with suitable low-density ingredients such as bagasse (the pulp remaining after extraction of sugar from the cane) so that one stick of the new product would give the same blasting action as one of the old. This provided a substantial saving to the user because the cost per stick of the new product was much lower.

The only difference between the low-density ammonia dynamites and the semigelatins is that the latter are partially gelatinized through the use of nitrocellulose and a higher nitroglycerin content. This gelatinization provides good water resistance and a degree of plasticity that is desirable in loading holes prior to blasting.

Means are available to obtain a moderate amount of water resistance in the ammonia dynamites without resorting to gelatinization of the nitroglycerin. The most common involve the use of water repellents, such as calcium stearate, and ingredients that form a water gel on the surface of the dynamite that slows down the further penetration of water. Examples of the latter are pregelatinized starch products and rye flour.

Low-freezing dynamite

Attempts to reduce the freezing point of nitroglycerin began shortly after the Nobels introduced it commercially. Frozen dynamite is very insensitive, sometimes so much so that it will not give dependable performance, and it is difficult to use, since it cannot be punched for the insertion of a blasting cap or slit and tamped into a borehole. Consequently, almost all of it had to be thawed for use, and careless thawing methods caused many accidents. Not until 1907 was a reasonably successful procedure for producing low-freezing dynamite developed. This involved adding 20 to 25 percent of the liquid isomers (molecules with identical formulas but different structure) of TNT to the nitroglycerin. This was replaced for a short time by a nitrated solution of sugar in glycerin. In 1911 a practical way to manufacture diglycerin (a glycerin polymer) was discovered. Its nitration product, tetranitrodiglycerin, when mixed with nitroglycerin, reduced its freezing point materially.

The ultimate solution to the freezing problem was found in 1925, when synthetic ethylene glycol became available. The explosive properties of ethylene glycol dinitrate are practically identical with those of nitroglycerin, and its low-freezing qualities are

extremely good. Dynamite containing a mixture of it and nitroglycerin was stored in the open at Point Barrow, Alaska, for four years without freezing.

Other explosives

Chlorates and perchlorates

Interest in the chlorates and perchlorates (salts of chloric or perchloric acid) as a base for explosives dates back to 1788. They were mixed with various solid and liquid fuels. Many plants were built in Europe and the United States for the manufacture of this type of explosive, mostly using potassium chlorate, but so far as can be determined, all of them either blew up or burned up, and no chlorate explosives have been manufactured for many years.

Sprengel explosives

In England in 1871, Hermann Sprengel patented combinations of oxidizing agents such as chlorates, nitrates, and nitric acid with combustible substances such as nitronaphthalene, benzene, and nitrobenzene. These differed from previous explosives in that one of the ingredients was liquid and the mixture was made just prior to use. Sprengel explosives were quite popular in Europe, but consumption in the United States was relatively small except for the spectacular Hell Gate blast in New York harbour in 1885, in which a combination of 34,000 kilograms (75,000 pounds) of No. 1 dynamite and 110,000 kilograms (240,000 pounds) of potassium chlorate–nitrobenzene were used to remove "Flood Rock," a menace to navigation. Cloth bags of the chlorate were soaked in the nitrobenzene and loaded directly from the soaking tank into the boreholes.

Liquid oxygen explosives

In 1895 the German Carl von Linde introduced carbon black packed in porous bags and dipped in liquid oxygen. This, which was a Sprengel-type explosive, came to be known as LOX. Because of the shortage of nitrates, LOX was widely used in Germany during World War I. Little if any was used in World War II, however, because ample supplies of nitrates could be obtained from synthetic ammonia.

Because the manufacture of liquid oxygen requires complicated and expensive equipment, the use of LOX was limited to areas that could consume very large quantities. In the United States several of the tremendous strip coal mines in the Midwest met this requirement. Maximum consumption of LOX explosive was about

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10,190,000 kilograms (22,465,000 pounds) in 1953, but it fell to zero in 1968. Inexpensive as LOX is, it cannot compete with ammonium nitrate–fuel oil mixtures.

Nitrostarch explosives

Nitrostarch, which is closely related to nitrocellulose, attracted early attention, but it was not until about 1905 that it proved possible to produce it in a stable form. In general nitrostarch explosives are similar to the straight and ammonia dynamites except that nitrostarch is used in place of nitroglycerin. Disadvantages are its relatively low strength, mediocre water resistance, and the fact that it cannot be transformed into gelatinous products. Nitrostarch explosives, however, do not produce the headaches from skin contact that are characteristic of mixtures containing nitroglycerin. For that reason they are still marketed.



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police: Explosives

Nitramon and Nitramex explosives

An important advance in explosives technology was the development by du Pont in 1934 of Nitramon, a canned product with a typical formula of 92 percent ammonium nitrate, 4 percent dinitrotoluene, and 4 percent paraffin wax. Some grades contain metallic ingredients such as aluminum and ferrosilicon. Nitramon is insensitive to the action of a line of detonating cord, a commercial blasting cap, shock and friction, or the impact of small-calibre ammunition. A large primer is required for its detonation, and the one normally used is known as a Nitramon primer. This is also a canned product with Nitramon at each end but a centre section of amatol that can be detonated by either detonating cord or a blasting cap. The cans are provided in varying sizes. A minimum diameter of 10 centimetres (4 inches) for regular Nitramon is necessary to ensure proper explosive effect if individual cans in a column become separated by some material such as a rock. Special grades are made for use in seismic exploration for gas and oil in 5- and 6.4-centimetre (2- and $2^1/_2$-inch) diameters. In this case, however, the cans are threaded and intimate contact is assured because the column is screwed together.

Nitramex is similar to Nitramon but is much stronger because it contains TNT and a metallic ingredient such as aluminum. Both it and Nitramon have been largely replaced by the water gels, which are described later.

So far as is known, the largest commercial, nonnuclear blast in North America was made on April 5, 1958, in Seymour Narrows, which lies between Vancouver Island

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and the mainland of British Columbia. The object of the blast was to remove the top of a submerged twin-peak mountain known as Ripple Rock, which was only 2.7 metres (9 feet) below the surface at low tide. More than 120 vessels had been lost because of this obstacle. In preparing for the blast, a shaft was sunk on shore to the proper depth. From it a tunnel was driven to a point directly under the twin peaks, from which a vertical shaft finally was driven to the desired depth below the peaks. A series of small horizontal drifts and pockets was prepared for placement of the explosives, consisting of 1,253,000 kilograms (2,756,000 pounds) of Nitramex 2H and a special primer, fired by means of detonating cord.

After the blast the top of the rock was a minimum of 15 metres (50 feet) below the surface and no longer a menace to navigation.

Modern high explosives

The year 1955, marking the beginning of the most revolutionary change in the explosives industry since the invention of dynamite, saw the development of ammonium nitrate–fuel oil mixtures (ANFO) and ammonium nitrate-base water gels, which together now account for at least 70 percent of the high explosives consumption in the United States. The technology of these products is far more advanced in the U.S. than it is in other countries; so, at the present time, they have not replaced nearly as much of the older explosives in the rest of the world. In addition to a variety of packages, both ANFO and water gels are delivered in bulk by special trucks and loaded directly into boreholes.

Ammonium nitrate–fuel oil mixtures

In 1955 it was discovered that mixtures of ammonium nitrate and fine coal dust would give very satisfactory blasting results in the large (about 22.5-centimetre, 9-inch) holes used in open-pit coal mines to remove the rock and soil covering the coal. Polyethylene bags for this material both stretched to fill the holes and provided a moderate amount of water resistance.

Shortly thereafter ANFO was evaluated in the open-pit iron mines of Canada and the United States, with a high degree of success. From there ANFO spread to other open pits, such as copper, and to construction work such as road building. It was then found that the mixture could be air blown into holes 5 centimetres in diameter, or even smaller, with excellent results. This led to its adoption in many underground mines.

ANFO applications were based on prilled rather than crystallized ammonium nitrate. Prills, or free-flowing pellets, were developed for the fertilizer market, which requires

a coarse product that has little tendency to set and can be spread easily and smoothly. A small amount of kieselguhr is generally added to improve the flowing properties. Prills are made by allowing droplets of ammonium nitrate that is almost molten to fall freely from a high tower. When they reach the bottom, they are dry and solidified, and slightly porous, which allows them to absorb and hold a greater amount of oil and gives a more sensitive product. ANFO is almost universally prepared by mixing 94 percent of prills with 6 percent of No. 2 fuel oil. The latter imparts some water resistance and, if that is not enough, polyethylene bags can often be used to give the necessary protection.

Water gels

A coal miner loading a drill hole with a water gel explosive called Tovex.

Water gels, or slurries, were introduced in 1958. These were, at first, mixtures of ammonium nitrate, TNT, water, and gelatinizing agents, usually guar gum and a cross-linking agent such as borax. (Cross-linking is a form of chemical bonding.) Later, aluminum and other metallic fuels were sometimes used and vastly better gelatinizers were discovered. In addition nonexplosive sensitizers were developed that could replace the TNT if desired. When the highest possible concentration of strength is needed, however, large quantities of TNT are still used.

Water gels have many advantages. Among them are a high concentration of strength, a high degree of water resistance, plasticity that permits them to displace air or water and completely fill the borehole, economy, ease of handling and loading, and good safety characteristics.

Nitrocellulosic explosives

When Christian Schoenbein invented nitrocotton (guncotton) in 1845 by dipping cotton in a mixture of nitric and sulfuric acids and then removing the acids by washing with water, he hoped to obtain a propellant for military weapons. It proved, however, to be too fast and violent. About 1860 Major E. Schultze of the Prussian army produced a useful nitrocellulosic propellant. He nitrated small pieces of wood by placing them in nitric acid and then, after removing the acid, impregnated the pieces with barium and potassium nitrates. The purpose of the latter was to provide oxygen to burn the incompletely nitrated wood. Schultze's powder was highly successful in shotguns but was too fast for cannon or even most rifles.

In 1884 a French chemist, Paul Vieille, made the first smokeless powder as it is now known. He partially dissolved nitrocellulose in a mixture of ether and alcohol until it became a gelatinous mass, which he rolled into sheets and then cut into flakes. When

the solvent evaporated, it left a hard, dense material resembling horn. This product gave satisfactory results in all types of guns.

In 1887 Nobel introduced another of his revolutionary inventions, which he called Ballistite. He mixed 40 percent of a lower nitrogen content, more soluble nitrocellulose, and 60 percent of nitroglycerin. Cut into flakes, this made an excellent propellant, and it continued in use for over 75 years. The British refused to recognize Nobel's patent and developed a number of similar products under the generic name cordite.

The progress of smokeless powder in the United States was much slower than it was in Europe. Long-continued work, principally by E.I. du Pont de Nemours & Company, finally resulted in a material that was excellent for guns of all types and sizes. It was first marketed about 1909 and was the most important type of smokeless powder used by the Allies in World War I. It was made from a nitrocotton of relatively low nitrogen content, called pyrocellulose, because that type is quite soluble in ether–alcohol. A small amount of diphenylamine was used as a stabilizer and, after forming the grains and removing the liquid, a coating of graphite was added. The smokeless powder most widely used in the United States at the present time is much the same. Other popular types are mostly double-base and may contain from about 20 to 35 percent nitroglycerin. Cotton linters for nitration have been almost, if not entirely, replaced by purified wood cellulose.

Blasting caps

Nobel's original fuse-type blasting cap remained virtually unchanged for many years, except for the substitution of 90–10 and 80–20 mixtures of mercury fulminate and potassium chlorate for the pure fulminate. This did not affect the performance materially and provided a substantial economy. Mercury fulminate is an example of an explosive that can be both primary and secondary. In its more compressed form it is a high density base charge; less compressed, a low density primer charge. Hexanitromannitol (nitromannite) functions in the same manner and is used that way in a very successful blasting cap.

Extensive work was carried out on replacements for the costly mercury fulminate; by 1930 little of it remained in use, and by the 1970s it had disappeared from commercial use. Experience has shown that the cheaper replacements are actually superior.

The dominant base-charge materials are now pentaerythritol tetranitrate (PETN) and cyclotrimethylenetrinitramine (RDX). These are as strong as nitroglycerin, quite safe to manufacture and handle, and relatively inexpensive. In addition to low density nitromannite, diazodinitrophenol, lead styphnate, and lead azide are widely

used as ignition-primer charges. One other departure from Nobel's blasting cap is the fact that aluminum has now almost entirely replaced copper as the material used for the shell.

Electrical firing

The principal advantages of electric over fuse firing are exact control of the time when the blast is initiated, the simultaneous firing of a number of shots, if that is desired, and the ability to obtain a very high degree of water resistance. Attempts to make electric blasting caps date back to the 1700s, but nothing of a really practical nature was developed until late in the 19th century. There were two separate problems, the cap and the means to fire it.

Blasting machines

The first satisfactory electrical blasting machine was invented by H. Julius Smith, an American, in 1878. It comprised a gear-type arrangement of rack bar and pinion that operated an armature to generate electricity. When the rack bar was pushed down rapidly, it revolved the pinion and armature with sufficient speed to obtain the desired current. This current was released into the external, or cap, circuit when the rack bar struck a brass spring in the bottom of the machine. Smith's blasting machine was improved and made in a range of capacities; also, a small twist-type machine that employed basically the same principles was introduced. These machines are still in widespread use, although they have been replaced to a considerable extent by power firing and capacitor-discharge blasting machines. The latter have a battery power source for energizing one or more capacitors and a safe, dependable means for discharging the stored energy. They have high capacity for their weight and size and are rapidly displacing the other firing systems.

Ignition systems

Except for the means of firing, there is little difference between electric and fuse-type blasting caps. With minor variations, the explosives used are the same.

It was in the 1880s that the forerunner of the modern electric blasting cap was first assembled. In contrast to the spark-type ignitions previously used, it employed a fine, high-resistance wire soldered between two insulated leg wires and embedded in, or coated with, an ignition mixture. The resistance wire was either platinum or one of its alloys, and the ignition mixture was based on mercury fulminate. The leg wires were insulated with two layers of cotton thread, wound in opposite directions. Except for coal-mine caps, the wire was then run through a bath of molten asphalt. Paraffin

wax was used for the coal-mine caps because its white colour provided good contrast with the black coal. Sulfur, or a mixture of sulfur and mica or graphite, was used to hold the leg wires in place and seal the cap. Sulfur was well suited for this purpose because its melting point is very low and it is compatible with the explosive ingredients. Later, to obtain better water resistance, part of the sulfur was replaced by asphalt.

In 1939 the du Pont company introduced a revolutionary new type of ignition system. Nylon plastic was substituted for the cotton insulation, a rubber plug to hold the leg wires replaced the sulfur plug, and the bridge wire was welded to the leg wires instead of soldered. By that time alloys such as nichrome had largely replaced the platinum bridge wires. The shell was crimped tightly to the rubber plug, with the result that the cap could withstand a substantial amount of water pressure. All electric blasting caps are now made substantially in this way. Polyvinyl chloride is widely used for the leg wire insulation, and plastic is sometimes substituted for rubber in the plug.

Match-head ignition, very popular in Europe, is used less widely in the United States. The ignition device consists of a piece of cardboard with a thin sheet of metal glued to each side. A bridge wire is soldered to these sheets, around the end of the cardboard, and this part of the assembly is dipped in a slurry of ignition mixture, usually based on copper acetylide. After drying, the match head is given a protective coating and is then soldered to the leg wires.

Most countries require explosives in underground coal mines to be fired electrically but prohibit the use of aluminum-shell electric blasting caps. This is because aluminum burns with a very hot flame and is much more likely than copper to ignite coal gas. Otherwise, almost all electric blasting-cap shells are made of aluminum.

Delay systems

Delay, or rotational, shooting has many advantages over instantaneous firing in almost all types of blasting. It generally gives better fragmentation, more efficient use of the explosive, reduced vibration and concussion, and better control of the rock. For these, and sometimes other reasons, most blasting operations are now conducted with a delay system.

It is probable that the first use of delay firing was in tunnels. The centre was shot out first and then successive rings around it until the desired tunnel dimensions were reached. The procedure was to cut all the fuses to the same length and then trim them toward the centre; for example, the outside ring of fuses would be full length, the next ring a few centimetres shorter, and so on. In addition, the fuses were lit from the centre out, causing a little more delay in the desired direction. This method of

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shooting could not be used until Bickford's safety fuse, which had a uniform burning speed, became available.

Delay electric blasting caps are the most commonly used means for obtaining rotational firing. They are of two types: (1) the so-called regular delay, which has been in use since the early 1900s, and (2) the short-interval, or millisecond, delay, which was introduced about 1943. Except for a delay element placed between the ignition and primer charges, they are the same as instantaneous electric caps.

A typical series of regular delays would comprise 14 periods ranging from a few milliseconds to about 12 seconds. To avoid overlapping and because there is some variation in the burning speed of the delay element, the intervals are made longer in the higher periods; for example, the delay between periods 1 and 2 might be 0.8 second, whereas for 13 and 14 it might be 1.5 seconds. Ordinary delays have been largely replaced by short-interval delays but are still used to a considerable extent for such purposes as driving tunnels and sinking shafts.

The periods in short-interval delays are usually separated by 25 milliseconds up to 200 milliseconds, by 50 up to 500, and by 100 up to 1,000 (one second). This close spacing gives improved fragmentation, the ability to fire many holes with hardly any more vibration or concussion than would be obtained with one hole, less chance that the detonation of one hole will cut off an adjacent hole, and a reduction in the quantity and cost of explosives. Short-interval delays are used above ground, in such work as excavating and quarrying, and for almost all types of underground mining. Their development is one of the major advances in explosives.

Delay elements for electric blasting caps function in about the same way as black powder in safety fuse, except that the chemical mixtures used are much faster. At times the delay mixture is simply pressed on top of the primer mix. Usually, however, it is put in the centre of a metallic tube in lengths that will give the desired delay interval.

Detonating cord

Detonating cord (detonating fuse) resembles safety fuse but contains a high explosive instead of black powder. The first successful one, patented in France in 1908, consisted of a lead tube, about the same diameter as safety fuse, filled with a core of TNT. It was made by filling a large tube with molten TNT that was allowed to solidify. The tube was then passed through successively smaller rolls until it reached the specified diameter. In France the product was called *cordeau détonant,* elsewhere shortened to cordeau. Its velocity was about 4,900 metres (16,000 feet) per second.

In 1936 the Ensign-Bickford Company, Simsbury, Connecticut, the American manufacturers of cordeau, developed Primacord, based on French patents and constituting a core of PETN covered with various combinations of textiles, waterproofing materials, and plastics. The velocity is approximately 6,400 metres (21,000 feet) per second. Many types of Primacord are available for both military and commercial use, but the industrial varieties generally contain from 25 to 60 grains of PETN per 0.3 metre. RDX is sometimes used in place of PETN for high temperatures, because the melting points are, respectively, 203.5° and 140° C (398.3° and 284° F).

Detonating cord has many applications in blasting. Any number of holes can be connected with it in just about any desired pattern. Attached to the blasting charge and knotted to a trunk line, it is fired by means of either a fuse-type or electric blasting cap. Sequential shooting may be obtained by cutting the trunk lines and inserting delay connectors, which have delay periods ranging from about 5 to 25 milliseconds.

Military explosives

Military requirements for high explosives differ in many respects from those for commercial users. Military explosives must have insensitivity to shock and friction and must be unlikely to detonate from small-arms fire and yet have excellent shattering power. They must have the ability to withstand long periods of adverse storage without deterioration and must be able to be fired in projectiles or dropped in aerial time bombs without premature explosion. Some types are required to possess almost unlimited water resistance. Many types must have complex fuses for detonation.

TNT

Trinitrotoluene (TNT) is the most useful military high explosive. Although it had been known for many years and was used extensively in the dye industry, it was not employed as an explosive until 1904. It is an excellent military explosive in itself, but its most valuable property is that it can be safely melted and cast either alone or as a slurry with other explosives. This is because there is a wide spread between its melting point and its decomposition temperature.

It has two shortcomings: first, it is extremely insensitive in the cast form, and second, it is difficult to cast without air holes. The first problem can be overcome by drilling a hole, about 2.5 centimetres (1 inch) in diameter, the length of the charge in the shell and filling it with trinitrophenylmethylnitramine (tetryl); the second, by using a mixture of 40 percent trinitroxylene (TNX) and 60 percent TNT. This mixture not

only casts perfectly but can be detonated with a smaller tetryl booster. There is no indication that any TNX was used in World War II; it is believed to have been replaced by PETN and RDX.

Picric acid and ammonium picrate

Picric acid was used as a shell explosive in Europe during the 1880s and carried through World War I on a large scale. Quantities of it were made in the United States, but the army and navy used mainly TNT.

Ammonium picrate (Explosive D) has exceptional value as a charge for armour-piercing projectiles. Loaded in a shell with a suitably insensitive primer, it can be fired through 30 centimetres (12 inches) of armour plate and made to detonate on the far side. These armour-piercing shells were used in both World Wars.

Early in World War I it was found that mixtures of molten TNT and ammonium nitrate were almost as effective for shell loadings as pure TNT. The mixtures most commonly used were 80–20 and 50–50 AN and TNT, known as amatol. Their principal advantages were that they made the supply of TNT go further and were considerably cheaper. In World War II the amatols were used in aerial bombs as well as artillery shells.

To conserve TNT in World War I, a nitrostarch-base composition was also developed for loading hand grenades and trench-mortar shells.

Several explosives, although previously known, only came into use during World War II. The most important of these were RDX, PETN, and ethylenediaminedinitrate (EDNA), all of which were cast with varying amounts of TNT, usually 40 to 50 percent, and used where the highest possible shattering power was desired. For example, cast 60–40 RDX-TNT, called cyclotol, develops a detonation pressure of about 270,000 atmospheres (4,000,000 pounds per square inch). Corresponding mixtures of PETN and TNT have almost as much shattering effect. The EDNA mixtures, or ednatol, were used only to a limited extent and for special purposes. Probably the most powerful of all nonatomic military explosives are the cast mixtures containing aluminum. The torpedo warhead Torpex, for example, is a cast mixture of RDX, TNT, and aluminum.

A series of plastic demolition explosives with great shattering power, designated Composition C-1 to Composition C-4, has had considerable publicity. These contain about 80 percent RDX combined with a mixture of various oils, waxes, and plasticizers. The only significant difference is in the temperature range through which they remain useful. C-3 stays plastic to −29° C (−20° F) and does not exude oil

below 49° C (120° F). In contrast, C-4 remains plastic to −57° C (−70° F) and does not leak below 77° C (170° F).

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Shaped charges

The shaped charge, principally the hand-fired rocket, is another highly publicized product introduced during World War II. A shaped charge normally consists of a cone made of metal or glass surrounded by a high-strength, high-density explosive and means to obtain the proper standoff, or distance to the target.

When the explosive is detonated, the cone is collapsed and vaporized, forming a small, high-temperature jet containing particles of liner material moving at 3,050 to 9,100 metres (10,000 to 30,000 feet) per second. This strikes the target with such heat and force that the target simply flows radially from the point of impact leaving a deep, nearly round hole. As spectacular as the results are, only about 15 percent of the explosive energy is focused.

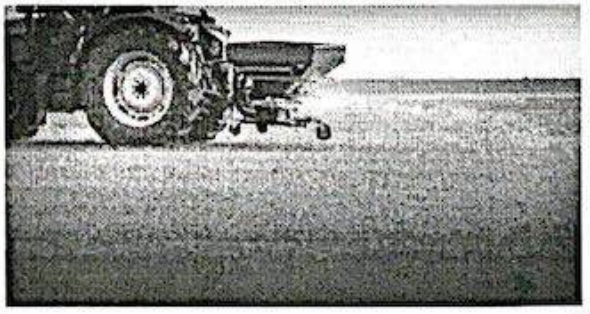
Other industrial applications

Explosive rivets

Blind rivets are needed when space limitations make conventional rivets impractical. One type of these is explosive; it has a hollow space in the shank containing a small charge of heat-sensitive chemicals. When a suitable amount of heat is applied to the head, an explosion takes place and expands the rivet shank tightly into the hole. The shank is normally open but can be sealed to eliminate noise and the ejection of metal fragments. Most explosive rivets are aluminum, but they can be obtained in stainless steel and certain other metals. Their use is mainly in aircraft.

Explosive bonding

Technology › Agriculture & Agricultural Technology



fertilizer A tractor spreading synthetic fertilizer.

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fertilizer

agriculture

Actions

Written by Robert E. Stewart
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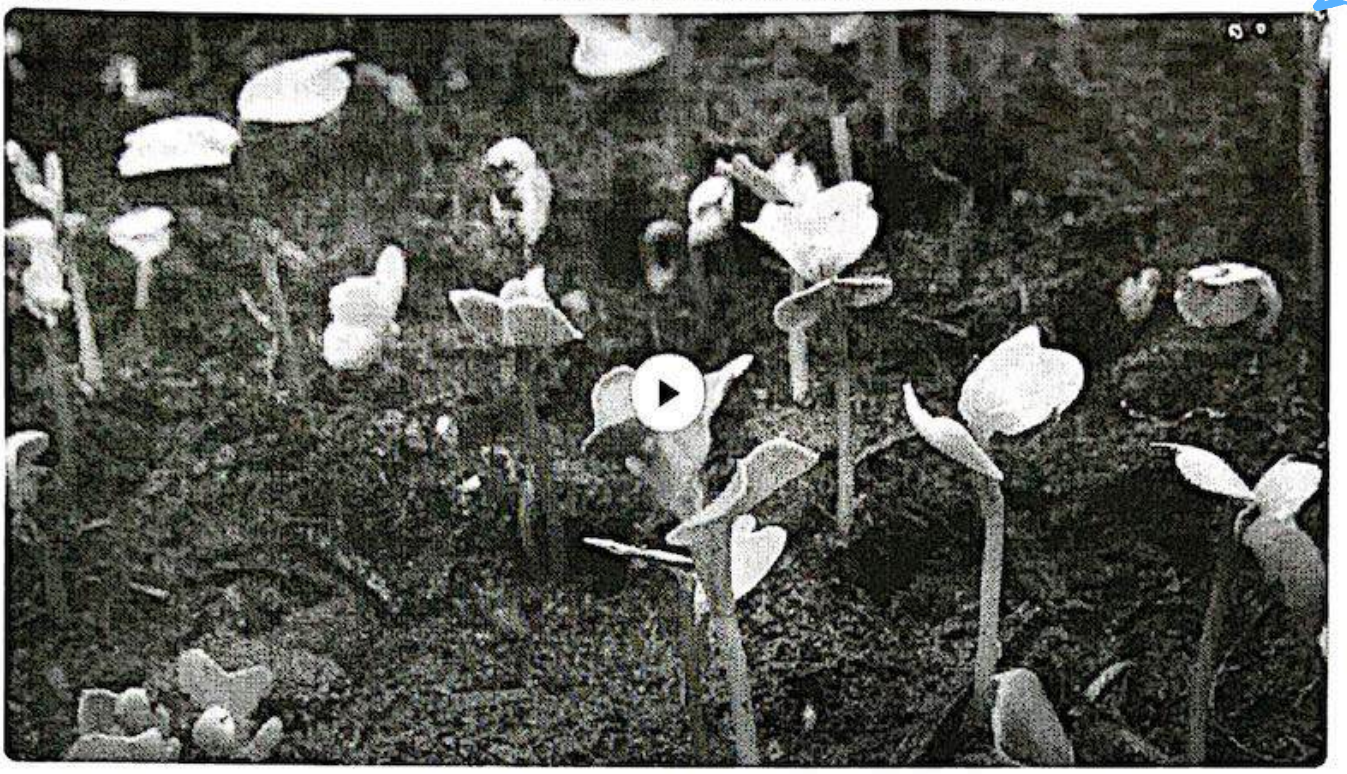
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fertilizer, natural or artificial substance containing the chemical elements that improve growth and productiveness of plants. Fertilizers enhance the natural fertility of the soil or replace chemical elements taken from the soil by previous crops.

Soil fertility is the quality of a soil that enables it to provide compounds in adequate amounts and proper balance to promote growth of plants when other factors (such as light, moisture, temperature, and soil structure) are favourable. Where fertility of the soil is not good, natural or manufactured materials may be added to supply the needed plant nutrients. These are called fertilizers, although the term is generally applied to largely inorganic materials other than lime or gypsum.

Essential plant nutrients

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Follow the nitrogen and phosphorus cycles and learn why farmers fertilize fields to keep them productive An overview of the nitrogen and phosphorus cycles in the biosphere. ...(more)

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In total, plants need at least 16 elements, of which the most important are carbon, hydrogen, oxygen, nitrogen, phosphorus, sulfur, potassium, calcium, and magnesium. Plants obtain carbon from the atmosphere and hydrogen and oxygen from water; other nutrients are taken up from the soil. Although plants contain sodium, iodine, and cobalt, these are apparently not essential. This is also true of silicon and aluminum.



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agricultural technology: Fertilizing and conditioning the soil

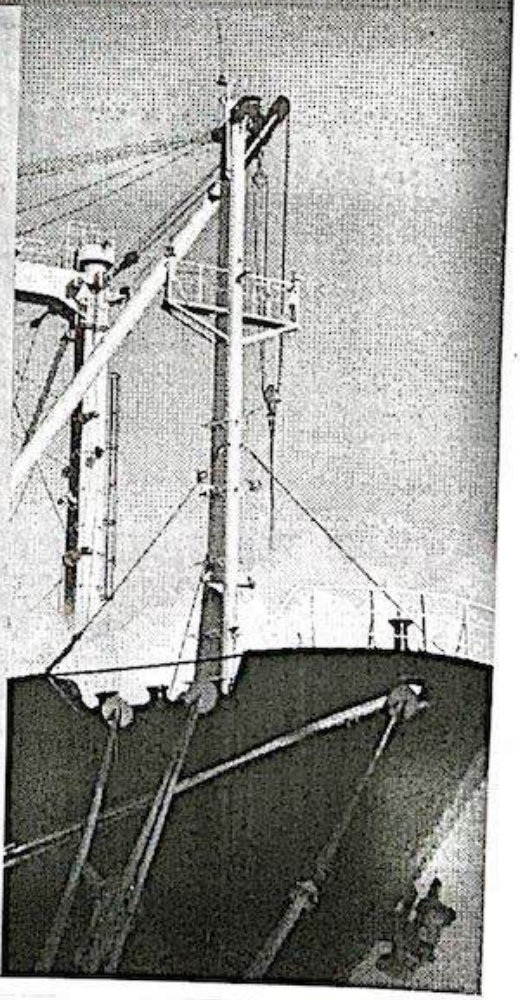
Overall chemical analyses indicate that the total supply of nutrients in soils is usually high in comparison with the requirements of crop plants. Much of this potential supply, however, is bound tightly in forms that are not released to crops fast enough to give satisfactory growth. Because of this, the farmer is interested in measuring the available nutrient supply as contrasted to the total nutrient supply. When the available supply of a given nutrient becomes depleted, its absence becomes a limiting factor in plant growth. Excessive quantities of some nutrients may cause a decrease in yield, however.

Determining nutrient needs

ANNEXURE 9

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GUIDANCE FOR SEA TRANSPORT OF AMMONIUM NITRATE BASED FERTILIZERS



european fertilizer manufacturers association

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EUROPEAN FERTILIZER MANUFACTURERS' ASSOCIATION
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DISCLAIMER:

The information and guidance provided in this document is given in good faith. EFMA members and staff accept no liability for any loss or damage arising from the use of this guidance.

1. SCOPE

This guidance describes safety practices recommended by the European Fertilizer Manufacturers' Association (EFMA) for the sea transport (ship loading, transportation and discharging) of ammonium nitrate (AN) based fertilizers.

Reference is made to the following official publications:

- *Recommendations on the Transport of Dangerous Goods: Model Regulations* (UN Orange Book), 13th edition, United Nations, Geneva/New York, 2003;
- *Recommendations on the Transport of Dangerous Goods: Manual of Tests and Criteria*, 3rd revised edition, United Nations, Geneva/New York, 1999;
- IMO International Maritime Dangerous Goods Code (IMDG Code), 2002;
- BC Code, Code of Safe Practice for Solid Bulk Cargoes, International Maritime Organisation (IMO), 2001.

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2. DESCRIPTION OF PRODUCTS

2.1. Types of products

AN-based fertilizers are of two main types:

- **Straight nitrogen fertilizers**
  These products contain only nitrogen (N) as the principal plant nutrient. Typical products are Ammonium Nitrate (AN) and Calcium Ammonium Nitrate (CAN), which are mixtures of AN and dolomite/limestone/calcium carbonate, and Ammonium Sulphate/Ammonium Nitrate (ASN) mixtures.
- **Compound fertilizers: NPK/NP/NK**
  These products contain, in addition to nitrogen, at least one other nutrient such as phosphate (a source of P_2O_5) and/or potash (a source of K_2O).

4/9/24, 12:08 PM Explosive - Mining, Blasting, Construction | Britannica

2.2. Methods of handling

Two main methods of handling are used (variations exist depending on national or port regulations):

- Packaged in IBCs of 500-1500 kg capacity, or in 25 or 50 kg bags on pallets with up to 1.5 tonne load;
- Loose bulk.

2.3. Classification and legal requirements

All fertilizers fall into one of three categories:

- Oxidisers belonging to Class 5.1, UN Number 2067 (Type A) (This includes the former UN Numbers 2068, 2069 and 2070; these numbers are allowed to be used during the transition period as specified by IMO);
- NPK/NP/NK fertilizers capable of self-sustaining decomposition belonging to Class 9, UN Number 2071 (Type B);
- Non-hazardous (Type C).

Compositions of fertilizers classified as dangerous goods are described below:

UN Number 2067 (Type A fertilizers):

- Straight nitrogen fertilizers containing AN > 80% and dolomite, limestone and/or calcium carbonate;
- Straight nitrogen fertilizers containing AN > 70% and other inorganic substances not covered above;
- Compound fertilizers (NPK, NP and NK) containing AN > 70%;
- Straight nitrogen fertilizers containing ammonium nitrate and ammonium sulphate (AS) in which 45%<AN<70% and AN+AS>70%.

See special provisions 186, 306, 307 in Chapter 3 of the UN Orange Book 13th edition 2003, or the IMO IMDG Code 2002 for details. In the latter, see also the additional special provision 900 (ammonium nitrate liable to self-heating sufficient to initiate a decomposition is prohibited for transport).

UN Number 2067 includes the former UN Numbers 2068, 2069 and 2070, but it is permitted to use these numbers during the transition period as specified by IMO.

Fertilizers belonging to UN Number 2067, when transported in bulk by sea, need to pass the official UN Resistance to Detonation Test (see IMO BC Code 2001) and the test certificate must be kept. Several European countries demand that the test certificate is not older than 3 months.

UN Number 2071 (Type B fertilizers)

This entry is for the sea transport of fertilizers which are within the compositions given below and are found to be capable of self-sustaining decomposition in the UN Trough Test (see IMO BC Code 2001 or UN Manual of Tests and Criteria, 3rd revised edition):

- NPK fertilizers with 45% < AN < 70%, with not more than 0,4% combustible/organic materials;
- NPK fertilizers with AN < 45% with unrestricted combustible/organic materials.

See special provisions 186, 193 in Chapter 3 of the UN Orange Book 13th edition or the IMO IMDG Code 2002 for details.

Fertilizers belonging to UN Number 2071 must be tested using the Trough Test to determine the speed of self-sustaining decomposition. Products with a speed of propagation of decomposition in excess of 25 cm/h as measured in this test, are not allowed to be transported by sea in bulk (see BC Code 2001).

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3. POTENTIAL HAZARDS OF AN-BASED FERTILIZERS

The three main potential hazards of relevance to AN-based fertilizers are:

- Fire

Ammonium nitrate itself does not burn, but is an oxidising substance and as such can support combustion. Therefore, combustible material must be present to have a fire involving ammonium nitrate. When an AN-based fertilizer is involved in a fire, or if it is heated to a certain extent, the AN will decompose and provide oxygen, thus increasing the fire hazard. The decomposition hazard can increase if the product, particularly spillage, is contaminated with combustible materials such as coal, grain, sawdust or oil spills.

In a fire incident the fertilizer will decompose with the release of toxic gases such as NO_x, ammonia, hydrogen chloride and nitric acid vapours.

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Decomposition

AN-based fertilizers can chemically break down under the influence of heat and this is known as decomposition. The presence of a combustible substance is not necessary for decomposition to take place. The decomposition hazard is dependent on the type of product, the temperature of the heat source, the duration of exposure to the heat source, and the containment of the fertilizer. There are certain compositions of compound fertilizers (NPK/NP/NK) which are capable of undergoing self-sustaining decomposition, i.e. once a hot source (e.g. a hot electric light bulb or hot welding material) has initiated the decomposition, the reaction in the fertilizer is sufficiently thermally energetic to continue on its own without further heat input from any outside source. Such fertilizers are described as Self-Sustaining Decomposition (SSD) type or 'cigar-burners'. Because of their relatively higher potential hazard they are classified as dangerous goods for sea transport. They are placed in UN Class 9 and are generally described as Type B fertilizers. The official UN Trough Test has been developed to determine this behaviour.

The decomposition hazard in straight- N fertilizers such as AN, CAN, ASN and in non-SSD type compound fertilizers (NPK, NP, NK) is dependent on contamination with sensitising materials such as chromates, chlorinated chemicals and various metals such as zinc and copper and their salts.

Decomposition is generally accompanied by the evolution of toxic gases such as NO_x, ammonia, hydrogen chloride and nitric acid vapours.

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Explosion/Detonation

AN and AN-based fertilizers are capable of detonating under certain conditions, requiring a strong source of initiation. Standard good-quality fertilizer products have high resistance to denotation as shown by the official UN Resistance to Detonation Test. This resistance, however, can be adversely affected by a number of factors, such as:

- Substantially smaller particle size,
- Higher porosity (hence a lower bulk density),
- High levels (above safe limits) of combustible, organic and other sensitising materials.

The addition of AS within certain limits generally increases the sensitivity to detonation.

Heating under severe confinement can also give rise to a potential explosion hazard.

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4. RECOMMENDED SAFETY PRACTICES

4.1. Safety principles

With regard to the potential hazards described on the previous pages the main safety principles applicable are:

- Avoid the storage of combustible substances near fertilizers;
- Avoid the storage of incompatible substances near fertilizers;
- Avoid cross contamination with the remains of previous cargoes;
- Avoid cross contamination of the next cargo with fertilizer;
- Avoid sources of heat likely to affect the fertilizer;
- Avoid the application of heat (e.g. welding) to any section which may have trapped/confined fertilizer.

4.2. Chartering

Vessels to be chartered for carrying fertilizers should be assessed and approved based on company criteria for safety, in addition to official statutory requirements.

The Charter Party and/or the voyage instructions should include reference to requirements for safety inspections prior to loading, for precautions relating to the risk of decomposition of fertilizers, and for immediately informing the port authorities, coastguards and charterers/suppliers in case of an emergency involving the fertilizer cargo, arising at sea or in port.

4.3. Checklists for loading and unloading operations

Exporters and importers are advised to use checklists to ensure that all necessary safety precautions are taken during the loading/transportation/unloading of AN-based fertilizers. Comprehensive checklists are given in Annexes 1 to 4 covering the main activities:

- Inspection of cargo holds prior to loading, see example in Annex 1;
- Ship/shore safety checklist, as per IMO's checklist for loading or unloading dry bulk cargo carriers, see Annex 2;
- An additional checklist should be completed for the loading of fertilizers classified as dangerous goods (Types A and B), see Annex 3 for Type A fertilizers and Annex 4 for Type B fertilizers.

4.4 Information to the Ship's Master

Prior to the loading of a ship, the following information should be communicated to the Ship's Master by a terminal representative:

- Safety data sheet for the product(s) to be loaded, including a reference to the emergency contact on shore;
- Instruction on avoidance of heat sources, see Annex 5;
- Instruction on handling emergencies in case of a decomposition onboard, see Annex 6.

The Master will confirm the receipt of this information by completing and signing the checklist in Annex 2.

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4.5. Use of compact shovels, loaders or similar equipment in the ship's hold

The following precautions should be taken where a compact shovel or similar equipment is used for removing the bulk fertilizer and emptying the vessel's hold:

- Provide a fire extinguisher on the loader;
- Fit a collecting device for spilt oil and grease underneath;
- Inspect flexible oil tubes and check for leaks;
- Fit spark arrestors on the exhaust;
- Do not permit the refuelling of the shovel/loader in the ship's hold.

4.6. Emergency preparedness

For the best possible preparedness, it is recommended that the terminal operator, the port authority and the local fire services collaborate in the development of an emergency plan and in the training of personnel handling incidents with AN-based fertilizers.

Terminals and ships storing/handling/carrying AN-based fertilizers should be equipped with high-pressure water lances (commonly known as the Victor lance) to penetrate into a heap of fertilizer in case of a decomposition incident.

4.7. Action in case of decomposition and fire

Decomposition is indicated by the release of white/brownish fumes from the fertilizer mass. If a zone of slow decomposition or smouldering of the AN-based fertilizer should occur, the following steps should be taken immediately, whether this occurs at the terminal or onboard the ship:

- Look for the source of heat and, if found, turn it off or remove it.
- If the area (zone) of decomposing material is still small and easily accessible, make an attempt to remove it from the main heap of the fertilizer by the use of picks, shovels or ship's grab, and to cool it down by localized quenching with water.

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- If it is impossible to remove the decomposing mass, soak the fertilizer involved as rapidly as possible with a large quantity of water preferably directed through high pressure jets against the centre of the decomposition. Fighting the decomposition by other means such as foam, carbon dioxide, steam, covering with sand or fertilizer, is useless and may even promote the decomposition.
- If fumes are present, use self-containing breathing apparatus. Take special care when entering the ship's hold.

If the decomposition takes place on the ship, the following additional actions should be considered:

- Choose the course of the ship so that any harmful fumes evolved will drift as little as possible over the ship, especially towards the crew's quarters and the bridge. If the ship lies in a port it may be necessary to move it away from the inhabited area.
- Open the hatches to provide ventilation. Avoid a gas-tight closure of the affected hold.
- If large quantities of water are necessary to control the decomposition, consider flooding the hold, with due regard to induced forces and ship stability.
- If suppression of the slow decomposition should prove impractical, there will not necessarily be an immediate danger to the ship if the decomposition has to be left to come to an end in the affected hold. However, suitable precautions should be taken to prevent the spread of decomposition or fire to cargoes in adjacent holds.

If a fire occurs onboard or in storage and the fertilizer is not involved, use suitable means to extinguish the fire depending on the combustible material involved. If, however, fertilizers are involved and are decomposing, only water must be applied as per the guidance given above.

Instructions for dealing with fires taking place in other parts of the ship, such as the engine room or living quarters, are outside the scope of this guidance and other appropriate guidance must be used.

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ANNEX 1:

Example of a checklist for the inspection of cargo holds prior to loading (for all fertilizers)

This inspection checklist has been issued solely for the purpose of charterer's internal use and may not be relied upon by the owners or any other party as evidence with respect to the condition of the vessel. It may not be construed as a waiver of any of the charterer's rights under the Charter Party, applicable laws and or conventions.

Tick off cell if compliant with Charter Party ☑
Mark cell with ✗ when not in compliance with Charter Party

Name of vessel:		Type of cargo:	
Year built:		UN No./IMDG class:	
Tonnes:		Loading port:	
Previous cargo:		Destination:	

Type of holds: Single deck ☐ Tweendeck ☐ Box shaped ☐
Type of hatch covers: Steel folding ☐ Steel pontoons ☐ Other: ☐
Type of tank top: Steel ☐ Other: ☐

	The following holds have been inspected:	HOLD	HOLD	HOLD	HOLD	HOLD
A	Condition of rubber gaskets					
B	Condition of compression bars					
C	Condition of draining canals/holes/pipes					
D	Condition of wedges/cleats					
E	Condition of hatch covers					
F	Condition of trimming holes on hatch covers					
G	Condition of hatch coaming					
H	Condition of hold					
I	Condition/Tightness of moveable bulkhead					
J	Hold ventilation closed					
K	Condition of entrance hatches/ladders					
L	Bilges empty					
M	Heat sources (lights, engines/pipelines etc)					
N	Availability of stevedores platform					
O	Electric circuits/lights in the holds turned off					
P	Ultrasound leak detector (ULD) test					

The following deficiencies must be rectified in order to comply with the terms agreed in the Charter Party:

	Name	Signature	Date	Time
Inspector				
Master				
Holds accepted for loading				

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ANNEX 2:

Ship/Shore Safety Checklist (for all fertilizers)

Name of vessel:			
Berth:	Port:	Arrival draught:	Calculated departure draught:
Date of arrival:	Time of arrival:	Arrival air draught:	Departure air draught:
Type of cargo for loading/unloading (delete as appropriate):		Quantity for loading/unloading (delete as appropriate):	

Disclaimer:
This checklist has been issued solely for the charterer's internal use and may not be relied upon by the owners or any other party as evidence with respect to the condition of the vessel. It may not be construed as a waiver of any of the charterer's rights under the Charter Party, applicable laws and or conventions.

Instructions for completion:
The safety of operations requires that all questions are answered affirmatively by ticking the box, by both the vessel representative and the terminal representative. If an affirmative answer is not possible, the reason should be given and an agreement should be reached upon the appropriate precautions to be taken between the ship and the terminal. Where a question is not considered applicable, a note to this effect shall be inserted in the remarks column.

No.	Check point	Vessel	Terminal	Remarks
1	Is the depth of water at the berth, and the air draught, adequate for the cargo operations to be completed? (Air draught refers to max mast height for passing under bridges, and height required under loaders/unloaders at the berth)			
2	Are mooring arrangements adequate for all local effects of tide, current, weather, traffic and craft alongside?			
3	In emergency, is the ship able to leave the berth at any time?			
4	Is there safe access between the ship and wharf? *Tended by Ship/Terminal* (delete as appropriate)			
5	Is the agreed ship/terminal communication system operative? *Communication method:* *Language:* *Radio channels/phone numbers:*			
6	Are the liaison contact persons during operations positively identified? *Ship contact person(s):* *Shore contact person(s):* *Location:*			
7	Are adequate crew onboard, and adequate staff in the terminal, for emergency?			
8	Have any bunkering operations been advised and agreed, with restrictions if loading ammonium nitrate based fertilizers?			
9	Have any intended repairs to wharf or ship whilst alongside been advised and agreed, with restrictions on hot work when fertilizer containing ammonium nitrate is being loaded or onboard?			
10	Has the procedure for reporting and recording damage from cargo operations been agreed?			
11	Has the ship been provided with copies of port and terminal regulations, including safety and pollution requirements and details of emergency services?			
12	Has the shipper provided the Master with the properties of the cargo in accordance with the requirements of Chapter VI of SOLAS?			

Ship/Shore Safety Checklist (for all fertilizers) *(continued)*

No.	Check point	Vessel	Terminal	Remarks
13	Is the atmosphere safe in holds and enclosed spaces to which access may be required, have fumigated cargoes been identified, and has the need for monitoring of the atmosphere been agreed by ship and terminal?			
14	Have the cargo handling capacity and any limits of travel for each loader/unloader been passed by the ship/terminal? *Loader no.* *Rate* *tonnes/hour* *Loader no.* *Rate* *tonnes/hour* *Loader no.* *Rate* *tonnes/hour*			
15	Has the cargo loading/unloading plan been calculated for all stages of loading/ballasting or unloading/ballasting? *Copy lodged with:*			
16	Have the holds to be worked been clearly identified in the loading and unloading plan, showing the sequence of work, and the grade and tonnage of cargo to be transferred each time the hold is worked?			
17	Has the need for trimming of cargo in the holds been discussed, and the method and extent been agreed?			
18	Do both ship and terminal understand and accept that if the ballast program becomes out of step with the cargo operation, it will be necessary to suspend cargo operation until the ballast operation has caught up?			
19	Have the intended procedures for removing cargo residues lodged in the holds while unloading, been explained to the ship and accepted?			
20	Have the procedures to adjust the final trim of the loading ship been decided and agreed? *Tonnage held by the terminal conveyor system:*			
21	Has the terminal been advised of the time required for the ship to prepare for sea, on completion of cargo work?			
22	Has the ship been advised on how to protect the fertilizer cargo from product quality damage during the voyage?			
23	Has the ship received and accepted the following information prior to loading: (1) Safety Data Sheet? (2) Instruction to ship's crew concerning the avoidance of heat sources when loading/unloading and carrying ammonium nitrate based fertilizers? (3) Instruction to ship's crew for handling of emergencies involving the decomposition of ammonium nitrate based fertilizers?			

Declaration:
We have checked, where appropriate jointly, the items on this checklist and have satisfied ourselves that the entries we have made are correct to the best of our knowledge, and arrangements have been made to carry out repetitive checks if necessary.

For Vessel:	For Terminal:
Name and rank:	Name and position:
Signature:	Signature:
Date and time:	Date and time:

ANNEX 3:

Ship/Shore Safety Checklist for Type A fertilizers (UN Number 2067 and former UN Numbers 2068, 2069 and 2070)

(in addition to Annex 2: General Ship/Shore Checklist for all fertilizers)

Name of vessel:	
Berth:	Port:
Date of arrival:	Time of arrival:
Type of cargo for loading/unloading (delete as appropriate): UN Number:	Quantity for loading/unloading (delete as appropriate):

Disclaimer:
This checklist has been issued solely for the charterer's internal use and may not be relied upon by the owners or any other party as evidence with respect to the condition of the vessel. It may not be construed as a waiver of any of the charterer's rights under the Charter Party, applicable laws and or conventions.

Instructions for completion:
The safety of operations requires that all questions are answered affirmatively by ticking the box, by both the vessel representative and the terminal representative. If an affirmative answer is not possible, the reason should be given and an agreement should be reached upon the appropriate precautions to be taken between the ship and the terminal. Where a question is not considered applicable, a note to this effect shall be inserted in the remarks column.

No.	Check point	Vessel	Terminal	Remarks
1	If carrying organic and/or combustible materials, is the fertilizer cargo separated from the organic/combustible cargo by a complete compartment or hold?			
2	Is the restriction observed not to load more than 4000 metric tons of fertilizer Type A onboard the vessel, when she also carries organic/combustible cargo?			
3	If other cargo is present or will be loaded in the same cargo hold as the fertilizer, is the other cargo compatible with the fertilizer material?			
4	Is the crew on the vessel aware that no welding, burning, cutting, or other operation involving the use of fire, open flame, spark or arc producing equipment should be carried out on deck, in the hold entrance or in the neighbouring hold as long as the fertilizer is onboard?			
5	Is it ensured that no bunkering or pumping of fuel will occur whilst loading or if the cargo hold is not closed sea tight?			
6	Has the firepump sufficient water capacity, preferably 1 m³ per minute or more?			
7	Are fire hoses laid out and ready for immediate use?			
8	Is the crew informed that smoking is not allowed on deck and in the cargo holds as long as fertilizer is onboard?			
9	Are "No smoking" signs displayed onboard and ashore? (The sign onboard should stay in position as long as the fertilizer is onboard.)			
10	Is there a fire watch at the loading spot?			
11	Is the bulkhead between the cargo space and the engine room insulated according to class "A-60" standard or an equivalent arrangement approved by the competent authority?			

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Ship/Shore Safety Checklist for Type A fertilizers (UN Number 2067 and former UN Numbers 2068, 2069 and 2070)

(in addition to Annex 2: General Ship/Shore Checklist for all fertilizers) *(continued)*

No.	Check point	Vessel	Terminal	Remarks
12	Is the official certificate stating that the vessel is approved for loading of the fertilizers, available onboard or made available by the agent?			
13	Is the cargo space free of wood and other combustible material?			
14	Have the fuel tanks next to and/or under the cargo hold been pressure tested and found free of any leakage? Is the test certificate available onboard?			
15	Are electric lamps, cables and other electric equipment in the fertilizer cargo holds disconnected and fuses removed? (This situation must be maintained as long as fertilizer is onboard.)			
16	Are cargo holds for fertilizers clear of steam pipes and similar heat sources?			
17	Is the temperature of the product before loading below 40°C?			
18	Is the ship flying the red B flag during daytime and showing a red light during night-time (360°)?			

Declaration: We have checked, where appropriate jointly, the items on this checklist, and have satisfied ourselves that the entries we have made are correct to the best of our knowledge, and arrangements have been made to carry out repetitive checks if necessary.	
For Vessel:	For Terminal:
Name and rank:	Name and position:
Signature:	Signature:
Date and time:	Date and time:

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ANNEX 4:

Ship/Shore Safety Checklist for Type B fertilizers (UN Number 2071)

(in addition to Annex 2: General Ship/Shore Checklist for all fertilizers)

Name of vessel:	
Berth:	Port:
Date of arrival:	Time of arrival:
Type of cargo for loading/unloading (delete as appropriate):	Quantity for loading/unloading (delete as appropriate):

Disclaimer:
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Instructions for completion:
The safety of operations requires that all questions are answered affirmatively by ticking the box, by both the vessel representative and the terminal representative. If an affirmative answer is not possible, the reason should be given and an agreement should be reached upon the appropriate precautions to be taken between the ship and the terminal. Where a question is not considered applicable, a note to this effect shall be inserted in the remarks column.

No.	Check point	Vessel	Terminal	Remarks
1	If carrying organic and/or combustible materials, is the fertilizer cargo separated from the organic/combustible cargo by a complete compartment or hold?			
2	If other cargo is present or will be loaded in the same cargo hold as the fertilizer, is the other cargo compatible with the fertilizer material?			
3	Is the crew on the vessel aware that no welding, burning, cutting, or other operation involving the use of fire, open flame, spark or arc producing equipment should be carried out on deck, in the hold entrance or in the neighbouring hold as long as the fertilizer is onboard?			
4	Is it ensured that no bunkering or pumping of fuel will occur whilst loading or if the cargo hold is not closed sea tight?			
5	Has the firepump sufficient water capacity, preferably 1 m^3 per minute or more?			
6	Are fire hoses laid out and ready for immediate use?			
7	Is the crew informed that smoking is not allowed on deck and in the cargo holds as long as fertilizer is onboard?			
8	Are "No smoking" signs displayed onboard and ashore? (The sign onboard should stay in position as long as the fertilizer is onboard.)			
9	Is there a fire watch at the loading spot, where such local regulations are applicable?			
10	If the vessel is not fitted with smoke detectors or other suitable detecting devices, will the fertilizer cargo holds be inspected at least every 4 hours as long as the fertilizer is onboard? (e.g. sniffing at ventilation ducts)			
11	If the fertilizer is separated from the engine room by means of metal plating, is the separation protected by means of fire retardant bags containing inert material or by any equivalent protection, approved by the competent authority?			

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Ship/Shore Safety Checklist for Type B fertilizers (UN Number 2071)

(in addition to Annex 2: General Ship/Shore Checklist for all fertilizers) *(continued)*

No.	Check point	Vessel	Terminal	Remarks
12	Is the official certificate stating that the vessel is approved for loading of the fertilizers, available onboard or made available by the agent?			
13	Is the cargo space free of wood and other combustible material?			
14	Is fuel oil contained in tanks adjacent to the fertilizer cargo hold prevented from being heated to more than 50°C?			
15	Are electric lamps, cables and other electric equipment in the fertilizer cargo holds disconnected and fuses removed? (This situation must be maintained as long as fertilizer is onboard.)			
16	Are cargo holds for fertilizers clear of steam pipes and similar heat sources?			
17	Are cargo holds with bagged fertilizers equipped with fans with ventilating capacity of 6 air changes per hour?			

Declaration:
We have checked, where appropriate jointly, the items on this checklist, and have satisfied ourselves that the entries we have made are correct to the best of our knowledge, and arrangements have been made to carry out repetitive checks if necessary.

For Vessel:	For Terminal:
Name and rank:	Name and position:
Signature:	Signature:
Date and time:	Date and time:

ANNEX 5:

Special warning concerning heat sources – for the Master's attention

Disclaimer:
This instruction has been issued solely for the charterer's internal use, and may not be relied upon by the owners or any other party as evidence with respect to the condition of the vessel. It may not be construed as a waiver of any of the charterer's rights under the Charter Party, applicable laws and or conventions.

INSTRUCTION TO THE SHIP'S CREW CONCERNING AVOIDANCE OF HEAT SOURCES WHEN LOADING/UNLOADING AND CARRYING AMMONIUM NITRATE BASED FERTILIZERS

All sources of heat must be kept away from ammonium nitrate based fertilizers, regardless of their classification. Potential heat sources are light bulbs, heating systems, steam pipes, electrical motors, live electrical cabling, naked flames, etc.

Therefore:

- Switch off all light and heat sources in cargo holds prior to loading and during the whole voyage as long as the fertilizer is onboard.
- Remove electric fuses to cargo holds and keep them removed until cargo is unloaded.
- Do not allow welding or other hot work that can affect the fertilizer.
- Display 'No Smoking' signs.



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ANNEX 6:

What to do in emergencies – for the Master's attention

Disclaimer:
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INSTRUCTION TO THE SHIP'S CREW FOR THE HANDLING OF EMERGENCIES INVOLVING THE DECOMPOSITION OF AMMONIUM NITRATE BASED FERTILIZERS

- If in port, contact the local emergency services.
- If at sea, contact the ship agent, shipping company or the supplier (as given on the safety data sheet).
- Avoid breathing fumes, as they may be toxic.
- Open hatches immediately to maximise ventilation.
- If possible, remove the heat source and extinguish the fire or decomposition.
- If possible, remove or separate the decomposing fertilizer material from the rest of the cargo, and drench it with water (salt or fresh).
- If not possible to remove or separate, drench the fertilizer in the cargo hold with water (salt or fresh). It is recommended to use water lances to penetrate the crust of decomposed fertilizers.
- DO NOT fight the decomposition by using foam, carbon dioxide, steam, sand or fertilizer.



USE WATER



NOT foam, CO_2, steam, sand, fertilizer

NOTES

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For more information about EFMA
visit the web-site www.efma.org

european fertiliser manufacturers association

 ANNEXURE 10

AMMONIUM NITRATE	ICSC: 0216

PHYSICAL & CHEMICAL INFORMATION

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Physical State; Appearance
COLOURLESS-TO-WHITE HYGROSCOPIC SOLID IN VARIOUS FORMS.

Physical dangers

Chemical dangers
Heating may cause violent combustion or explosion. Decomposes on heating. This produces toxic fumes. The substance is a strong oxidant. It reacts with acids and combustible and reducing materials.

Formula: NH_4NO_3
Molecular mass: 80.0
Decomposes at > 210°C
Melting point: 170°C
Density: 1.7 g/cm³
Solubility in water, g/100ml at 20°C: 200

EXPOSURE & HEALTH EFFECTS

Routes of exposure
The substance can be absorbed into the body by inhalation and by ingestion.

Effects of short-term exposure
The substance is irritating to the eyes, skin and respiratory tract. The substance may cause effects on the blood. This may result in the formation of methaemoglobin. The effects may be delayed.

Inhalation risk
Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly when dispersed, especially if powdered.

Effects of long-term or repeated exposure

OCCUPATIONAL EXPOSURE LIMITS

ENVIRONMENT

Avoid release to the environment in circumstances different to normal use.

NOTES

UN number 1942 refers to pure ammonium nitrate with not more than 0.2% combustible material.
Ammonium nitrate can refer to a range of ammonium nitrate-based fertilizers (with UN number 2067).
The physico-chemical properties may vary according to the chemical composition.
This ICSC covers pure ammomium nitrate - the properties of fertilizers will be different.
Will turn shock-sensitive if contaminated with organic materials.
Rinse contaminated clothing with plenty of water because of fire hazard.
Depending on the degree of exposure, periodic medical examination is suggested.
The storage of pure ammonium nitrate is often regulated - check for local regulations.
In the event of a fire, large piles of ammonium nitrate present an explosion hazard. Large piles might need to be dismantled.

ADDITIONAL INFORMATION

EC Classification

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AMMONIUM NITRATE Nitric acid, ammonium salt	ICSC: 0216 (October 2013)
CAS #: 6484-52-2 **UN #: see Notes** **EC Number: 229-347-8**	

	ACUTE HAZARDS	PREVENTION	FIRE FIGHTING
FIRE & EXPLOSION	Not combustible but enhances combustion of other substances. Gives off irritating or toxic fumes (or gases) in a fire. Risk of fire and explosion on confinement and exposure to high temperatures or when contaminated with other materials.	NO contact with combustible substances or reducing agents. See Notes.	Use water in large amounts. NO other agents. In case of fire in the surroundings, use appropriate extinguishing media. In case of fire: keep drums, etc., cool by spraying with water. Combat fire from a sheltered position.

PREVENT DISPERSION OF DUST!			
	SYMPTOMS	**PREVENTION**	**FIRST AID**
Inhalation	Cough.	Use local exhaust or breathing protection.	Fresh air, rest. Seek medical attention if you feel unwell.
Skin	Redness.	Protective gloves.	Rinse skin with plenty of water or shower. Remove contaminated clothes.
Eyes	Redness. Pain.	Wear safety goggles.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.
Ingestion	Vomiting. Diarrhoea. Blue lips, fingernails and skin. Weakness.	Do not eat, drink, or smoke during work.	Rinse mouth. Refer for medical attention .

SPILLAGE DISPOSAL	CLASSIFICATION & LABELLING
Personal protection: particulate filter respirator adapted to the airborne concentration of the substance. Sweep spilled substance into covered non-combustible containers. Store and dispose of according to local regulations. Wash away remainder with plenty of water.	**According to UN GHS Criteria** flam circle excl mark;warn cancer;health haz **WARNING** May intensify fire; oxidizer May be harmful if swallowed Causes skin irritation Causes serious eye irritation May cause damage to blood
STORAGE	**Transportation** **UN Classification** UN Hazard Class: 5.1; UN Pack Group: III
Separated from combustible substances and reducing agents. Dry. Well closed.	
PACKAGING	

International Labour Organization
World Health Organization
Prepared by an international group of experts on behalf of ILO and WHO, with the financial assistance of the European Commission.
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ANNEXURE II

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Frequently Asked Questions

1. What is Ammonium Nitrate (AN)?

Ans. Pure ammonium nitrate (NH4NO3) is a white, water-soluble, crystalline substance with a melting point of 170°C. The substance is classified as an oxidising agent Class 5.1 (UN1942). It is one of the base ingredients used in the manufacture of commercial explosives. Due to this reason Ammonium Nitrate has been declared as an explosives and defined in Rule 2(b) of the Ammonium Nitrate Rules, 2012.

2. Is ammonium nitrate classified as an explosive ?

Ans. 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.

3. What makes ammonium nitrate so explosive?

Ans. Ammonium Nitrate is not an explosive by itself. However, it is one of the ingredients used for manufacture of explosives. It is classified as an oxidizer (5.1) as per UN classification for Dangerous Goods. Other ingredients like fuel, etc., have to be added to make it an explosive. For such explosive mixtures to explode, initiators like detonators are required.

4. Why is it necessary to regulate the use of ammonium nitrate?

Ans. Ammonium Nitrate is a necessary major ingredient for manufacture of explosives and it has been declared as a deemed explosives vide Notification No. G.S.R. S.O. 1678(E) dated 21/07/2011. It has the potential to form an explosive mixture on the addition of ingredients like fuel etc., Hence, it is necessary to regulate the use of Ammonium Nitrate for which the Ammonium Nitrate Rules, 2012 have been framed.

5. Is it possible to explode a consignment of ammonium nitrate?

Ans. Ammonium Nitrate does not explode by itself.

6. To what use can ammonium nitrate be put to?

Ans. Ammonium Nitrate is used as an ingredient for manufacture of explosives, anaesthetic gases, fertilizers, cold packs, etc. – Herbicide, Insecticide, To make nitrous oxide, Rocket propellant, nutrient for yeast, antibiotics, Explosives for mining, constructions,

7. What are the Acts or Rules under which licenses are required to be obtained for activities related to ammonium nitrate?

Ans. 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. For manufacture of Ammonium Nitrate an Industrial licence is required under the IDR Act, 1951. A license under the Ammonium Nitrate Rules, 2012 is also required for any of the activities mentioned above.

8. What is the difference between Industrial licence issued under IDR Act and the licence issued by PESO under the Ammonium Nitrate Rules, 2012?

Ans. Industrial licence is granted by DIPP under the IDR Act, 1951 for manufacture of Ammonium Nitrate.
Licence for Manufacture, conversion, stevedoring and bagging, import, export, transport, possession for sale or use of Ammonium Nitrate is issued by Petroleum & Explosives Safety Organization (PESO) under the Ammonium Nitrate Rules, 2012 covered under the Explosives Act, 1884. The objective of the Explosives Act is to prevent accidents i.e. safety and for accountal of ammonium nitrate consignments. There are also certain basic security provision like boundary-wall of the premises, locking of godowns, guards, escorting of consignments by guards, escorting in sensitive areas, etc. which have been provided under the said Rules.

9. How does one get a licence for carrying out activities related to AN under the Ammonium Nitrate Rules, 2012?

Ans. For getting a licence under the Ammonium Nitrate Rules, 2012, Application form, fees and documents as specified in the rules have to be submitted to the licensing authority concerned, as specified in Schedule I. Prior approval before construction of facilities has to be obtained in accordance with Rule 30 of the Ammonium Nitrate Rules. Such approval shall not be necessary for the facilities of Ammonium Nitrate existing as on the date of publication of these rules. After construction of the facilities as per approval granted, application for grant of licence in accordance with rule 31 of the Ammonium Nitrate Rules, 2012 has to be submitted. If all documents are found in order, licence is granted and forwarded to the officer concerned for inspection of the premises. After inspection, the licence is endorsed and issued to the licensee. Status of applications can be viewed online in the public domain link at www.peso.gov.in .

10. What are the documents required for obtaining licence under Ammonium Nitrate Rules, 2012?

Ans. After the construction of premises, as per plan approved under rule 30, the applicant shall apply for grant of licence along with documents stated in rule 31 to the authority empowered to grant such licence as specified in Schedule 1.

11. What is the fee for applying for Ammonium Nitrate licenses?

Ans. The fee for applying for Ammonium Nitrate licence is specified in Rule 29 of Ammonium Nitrate Rules, 2012 and depends on the scope and scale of activity.

12. What is the maximum period for which Ammonium Nitrate licence is granted under Ammonium Nitrate Rules, 2012? Is the licence renewable?

Ans. The licensing authority may grant a licence for a period not exceeding five financial years from the date of issue of license, including or part thereof ending on the 31st March for all purposes, except for licence for import and export, which shall be valid for one year from the date of issue. The license is renewable.

13. Who is responsible for ensuring security of ammonium nitrate consignment in factories, storage depots and in transit?

Ans. Under the AN Rules, assessment of the security provision is the responsibility of the district authorities concerned. At the time of applying for a license, a person intending to manufacture, convert, stevedore, bag, possess for sale or use, transport, import or export Ammonium Nitrate shall submit Safety and Security Management Plan to the licensing authority and to the District Authority with the security aspect duly vetted by the police authorities for approval.

District Authority here means - in towns having a Commissioner of Police, the Commissioner or Deputy Commissioner of Police and in any other place the District Magistrate or the Addl. District Magistrate.

Provision of security guards within factories and storage godowns is done by the license holder under Rule 12(1) & (2).

While being transported, the vehicles carrying Ammonium Nitrate shall be accompanied by at least two able bodied guards. A vehicle while transporting Ammonium Nitrate shall be adequately secured at the expense of the licence holder and if the consignment of Ammonium Nitrate is likely to pass through sensitive areas notified by the Ministry of Home Affairs, it should be escorted by armed police escort or guard, provided by the District Police Administration as specified in Rule 22(2) & 22(4).

As specified in the licensing conditions, losses, shortage or theft of Ammonium Nitrate shall be immediately reported by the licensee to the nearest police station and the district authority.

14. Who is responsible for ensuring security of AN consignment in sensitive areas/ notified areas (specially in naxalite areas)?

Ans. As per Rule 22(4), a vehicle while transporting Ammonium Nitrate shall be adequately secured at the expense of the licence holder and if the consignment of Ammonium Nitrate is likely to pass through sensitive areas notified by the Ministry of Home Affairs, it should be escorted by armed police escort or guard, provided by the District Police Administration.

Hence, security for consignments of ammonium nitrate is the responsibility of the licensee, police and District Authorities.

15. Whether police escorting is mandatory for vehicles transporting ammonium nitrate. If so, who will provide the police/ armed guards?

Ans. At present police escorting is not mandatory for the vehicles carrying Ammonium Nitrate for movement in regular areas. However, it shall be accompanied by at least

two able bodied guards provided at the expense of the licensee. Only if the consignment of Ammonium Nitrate is likely to pass through sensitive areas notified by the Ministry of Home Affairs, it shall be escorted by armed police escort or guard, provided by the District Police Administration.

16. Who is responsible in case of breach of the provisions of the Rules? Who is responsible for taking action in such cases?

Ans. Incase the violation of provision relates to the functional aspects within the premises of the license holder, the concerned license issuing authority- District Administration or PESO as the case may be, may suspend or cancel the license depending on the severity of the non compliance.

For cases of security which relate to thefts, pilferage, diversion, etc. the police authorities take appropriate penal action. In such cases the licensing authorities may also suspend or cancel the license. PESO's responsibility in the severest of cases, on such occasions, is limited to cancelling of license. For such cases the Ammonium Nitrate Rules 2012 by itself do not contain any penal provision. The District Administration may book the person under the Explosives Act 1884, The Explosive Substances Act 1908, or any other relevant act or rule.

17. Whether Central PSUs are also exempted from obtaining licence from the Ammonium Nitrate Rules.

Ans. No. Central PSUs are not exempted from obtaining licence under the Ammonium Nitrate Rules, 2012. Exemption has been granted to Armed Forces of the Union and Ordnance Factories or other establishments of such Forces for own use in accordance with the rules or regulations made by the Central Government;

(a) The Indian Railways and its authorized carriers while acting as carrier;
(b) The Port authority;
(c) any person employed under the Central Government or State Government in exercise of any power under the Act or these rules.

18. Whether State PSUs are exempted from the requirement of obtaining Industrial Licence under IDR Act.

Ans. No. As per the letter No. 2(2)/2013-Expls dated 06/06/2013 issued by DIPP, exemption has been granted for Central PSUs, but there is no reference of State PSUs.

19. Can Ammonium Nitrate be imported in India?

Ans. Yes, Ammonium Nitrate can be imported in India.

20. What are total imports?

Ans. No licence has been granted by this office for import of AN, hence, exact figures are not available with this office. It is estimated that approx. 20,000 MT of AN has been imported in this financial year.

21. What are the total domestic productions?

Ans. The Ammonium Nitrate Rules have been notified in July 2012. Since there was no regulation on ammonium nitrate before that date, no verifiable data is available regarding its production. At present the licensing process is under way. As per the applications received for manufacture of Ammonium Nitrate the total installed capacity of the five major manufacturers in India is 1054830 MT. The manufacturing capacity for converters is 197400MT. The capacity for extraction of AN from sludge received from nuclear fuel complex is 11400MT.

22. How many manufacturers have applied for license under AN Rules 2012 and how many are pending for clearance?

Ans. Out of five major manufacturers of AN in India, M/s. Gujarat Narmada Fertilizers and Chemicals Ltd., (GNFC) has been granted license to manufacture ammonium nitrate. Four others have also applied and are awaiting grant of NOC from respective district authorities.

23. What is the current regulation on import of AN?

Ans. Import of Ammonium Nitrate is presently regulated under Ammonium Nitrate Rules, 2012. As per DGFT Notification No. 34(RE-2103)/2009-2014 dated 14/08/2013, the revised import policy of item 'Ammonium Nitrate' whether or not in aqueous solution' under Exim Code 3102 30 00 in Chapter 31 of the ITC(HS), 2012 Schedule I (Import Policy). As per the policy condition, import of Ammonium Nitrate having the chemical formula NH_4NO_3 or any combination containing more than 45 percent Ammonium Nitrate by weight including emulsions, suspensions, melts or gels (with or without inorganic nitrates) would require the approval of Chief Controller of Explosives (CCE/PESO). Ports for import of AN have also been notified by Ministry of Shipping vide Notification No. GSR2182(E) dated 16th July, 2013.

24. Does the AN Rules provide any penal provision of fine/ arrest etc.

Ans. Penal provisions like fine/arrest etc. are not covered in the AN Rules.

25. In case of illegal activity relating to manufacturing, use, conversion of AN, theft or diversion, who is responsible to act- PESO or the police authorities?

Ans. As per Rule 51 of AN Rules, 2012 Police and concerned District Authority are responsible to act against any of the illegal activity detailed above. The rules do not provide for any responsibility of PESO with respect to this aspect.

26. Where does AN find its maximum usage?

Ans. AN find its maximum usage in Explosives Industry.

27. What is the total requirement of Ammonium Nitrate (AN) by the explosives industries in the country?

Ans. The estimated requirement of AN by the explosives industries is approx. 600,000 MT annually.

28. What are the total imports and domestic production of ammonium nitrate?

Ans. As per the information available with the Petroleum Safety and Explosives Organization (PESO) the level of indigenous manufacture and imports of ammonium nitrate are as follows-

	2011-12	2012-2013
Imports	365700	226000
Domestic manufacture	389667	304000
Total	*755367*	*530000*

*all figures in tons

29. What is the existing manufacturing capacity of ammonium nitrate in the country?

Ans. As per the applications received for manufacture of Ammonium Nitrate the total installed capacity of the five major manufacturers in India is 1054830 MT. The manufacturing capacity for converters is 197400MT. The capacity for extraction of AN from sludge received from nuclear fuel complex is 11400MT.

30. What are the health effects from ammonium nitrate?

Ans. Hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation (lung irritant). Slightly hazardous in case of skin contact (permeator). Prolonged exposure may result in skin burns and ulcerations. Over-exposure by inhalation may cause respiratory irritation.

31. What steps has been taken recently by the Govt. of India to regulate the manufacture & use of Ammonium Nitrate?

Ans. To regulate the manufacture & use of Ammonium Nitrate, Ammonium Nitrate Rules, 2012 have been notified vide G.S.R. NO. 553(E) dated 11/07/2012.

ANNEXURE 12

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NJ Health New Jersey Department of Health

Right to Know Hazardous Substance Fact Sheet

Common Name: **AMMONIUM NITRATE**

Synonyms: Nitram; Ammonia Nitrate

Chemical Name: Nitric Acid, Ammonium Salt

Date: July 2007 Revision: February 2016

CAS Number: 6484-52-2

RTK Substance Number: 0106

DOT Number: UN 1942

EMERGENCY RESPONDERS >>>> SEE BACK PAGE

Description and Use

Ammonium Nitrate is an odorless, colorless, white to gray crystalline (sand-like) flake, bead or granule. It is used to make explosives, matches, fertilizers, and antibiotics.

Hazard Summary

Hazard Rating	NJDHSS	NFPA
HEALTH	-	2
FLAMMABILITY	-	0
REACTIVITY	-	3

REACTIVE
POISONOUS GASES ARE PRODUCED IN FIRE
CONTAINERS MAY EXPLODE IN FIRE
OXIDIZER

Hazard Rating Key: 0=minimal; 1=slight; 2=moderate; 3=serious; 4=severe

Reason for Citation

- **Ammonium Nitrate** is on the Right to Know Hazardous Substance List because it is cited by DOT and NFPA.
- This chemical is on the Special Health Hazard Substance List.

- **Ammonium Nitrate** can affect you when inhaled and by passing through your skin.
- Contact can irritate and burn the skin and eyes.
- Inhaling **Ammonium Nitrate** can irritate the nose, throat and lungs.
- High levels may cause *methemoglobinemia* with headache, fatigue, and a blue color to the skin and lips.
- **Ammonium Nitrate** is REACTIVE and a DANGEROUS EXPLOSION HAZARD.

SEE GLOSSARY ON PAGE 5.

FIRST AID

Eye Contact

- Immediately flush with large amounts of cool water for at least 15 minutes, occasionally lifting upper and lower lids. Remove contact lenses, if worn, while rinsing.

Skin Contact

- Quickly remove contaminated clothing. Immediately wash contaminated skin with large amounts of water.

Inhalation

- Remove the person from exposure.
- Begin rescue breathing (using universal precautions) if breathing has stopped and CPR if heart action has stopped.
- Transfer promptly to a medical facility.

EMERGENCY NUMBERS

Poison Control: 1-800-222-1222

CHEMTREC: 1-800-424-9300

NJDEP Hotline: 1-877-927-6337

National Response Center: 1-800-424-8802

Workplace Exposure Limits

No occupational exposure limits have been established for **Ammonium Nitrate**. This does not mean that this substance is not harmful. Safe work practices should always be followed.

- It should be recognized that **Ammonium Nitrate** can be absorbed through your skin, thereby increasing your exposure.

Determining Your Exposure

- Read the product manufacturer's Material Safety Data Sheet (MSDS) and the label to determine product ingredients and important safety and health information about the product mixture.
- For each individual hazardous ingredient, read the New Jersey Department of Health and Hazardous Substance Fact Sheet, available on the RTK website (http://nj.gov/health/workplacehealthandsafety/right-to-know/) or in your facility's RTK Central File or Hazard Communication Standard file.
- You have a right to this information under the New Jersey Worker and Community Right to Know Act, the Public Employees Occupational Safety and Health (PEOSH) Act if you are a public worker in New Jersey, and under the federal Occupational Safety and Health Act (OSHA) if you are a private worker.
- The New Jersey Right to Know Act requires most employers to label chemicals in the workplace and requires public employers to provide their employees with information concerning chemical hazards and controls. The federal OSHA Hazard Communication Standard (29 CFR 1910.1200) requires private employers to provide similar information and training to their employees.

This Fact Sheet is a summary of available information regarding the health hazards that may result from exposure. Duration of exposure, concentration of the substance and other factors will affect your susceptibility to any of the potential effects described below.

Health Hazard Information

Acute Health Effects
The following acute (short-term) health effects may occur immediately or shortly after exposure to **Ammonium Nitrate**:

- Contact can irritate and burn the skin and eyes.
- Inhaling **Ammonium Nitrate** can irritate the nose, throat and lungs.
- Overexposure can cause nausea, vomiting, flushing of the face and neck, headache, weakness and collapse.
- High levels can interfere with the ability of the blood to carry *Oxygen* causing headache, fatigue, dizziness, and a blue color to the skin and lips (*methemoglobinemia*). Higher levels can cause trouble breathing, collapse and even death.

Chronic Health Effects
The following chronic (long-term) health effects can occur at some time after exposure to **Ammonium Nitrate** and can last for months or years:

Cancer Hazard
- According to the information presently available to the New Jersey Department of Health, **Ammonium Nitrate** has not been tested for its ability to cause cancer in animals.

Reproductive Hazard
- According to the information presently available to the New Jersey Department of Health, **Ammonium Nitrate** has not been tested for its ability to affect reproduction.

Other Effects
- No chronic (long-term) health effects are known at this time.

Medical

Medical Testing
If symptoms develop or overexposure is suspected, the following is recommended:

- Blood methemoglobin level

Any evaluation should include a careful history of past and present symptoms with an exam. Medical tests that look for damage already done are not a substitute for controlling exposure.

Request copies of your medical testing. You have a legal right to this information under the OSHA Access to Employee Exposure and Medical Records Standard (29 CFR 1910.1020).

Workplace Controls and Practices

Very toxic chemicals, or those that are reproductive hazards or sensitizers, require expert advice on control measures if a less toxic chemical cannot be substituted. Control measures include: (1) enclosing chemical processes for severely irritating and corrosive chemicals, (2) using local exhaust ventilation for chemicals that may be harmful with a single exposure, and (3) using general ventilation to control exposures to skin and eye irritants. For further information on workplace controls, consult the NIOSH document on Control Banding at www.cdc.gov/niosh/topics/ctrlbanding/.

The following work practices are also recommended:

- Label process containers.
- Provide employees with hazard information and training.
- Monitor airborne chemical concentrations.
- Use engineering controls if concentrations exceed recommended exposure levels.
- Provide eye wash fountains and emergency showers.
- Wash or shower if skin comes in contact with a hazardous material.
- Always wash at the end of the workshift.
- Change into clean clothing if clothing becomes contaminated.
- Do not take contaminated clothing home.
- Get special training to wash contaminated clothing.
- Do not eat, smoke, or drink in areas where chemicals are being handled, processed or stored.
- Wash hands carefully before eating, smoking, drinking, applying cosmetics or using the toilet.
- When vacuuming, a high efficiency particulate air (HEPA) filter should be used, not a standard shop vacuum.

In addition, the following may be useful or required:

- Before entering a confined space where **Ammonium Nitrate** may be present, check to make sure that an explosive concentration does not exist.
- Use a vacuum or a wet method to reduce dust during clean-up. DO NOT DRY SWEEP.

Personal Protective Equipment

The OSHA Personal Protective Equipment Standard (29 CFR 1910.132) requires employers to determine the appropriate personal protective equipment for each hazard and to train employees on how and when to use protective equipment.

The following recommendations are only guidelines and may not apply to every situation.

Gloves and Clothing

- Avoid skin contact with **Ammonium Nitrate**. Wear personal protective equipment made from material which can not be permeated and/or degraded by this substance. Safety equipment suppliers/manufacturers can provide recommendations on the most protective glove/clothing material for your operation.
- Safety equipment manufacturers recommend *Butyl* or *Neoprene* for gloves and CHEMFAB *Challenger® 5200* as protective material for clothing.
- All protective clothing (suits, gloves, footwear, headgear) should be clean, available each day, and put on before work.

Eye Protection

- Wear eye protection with side shields or goggles.
- Wear a face shield along with goggles when working with corrosive, highly irritating or toxic substances.

Respiratory Protection

Improper use of respirators is dangerous. Such equipment should only be used if the employer has a written program that takes into account workplace conditions, requirements for worker training, respirator fit testing, and medical exams as described in the OSHA Respiratory Protection Standard (29 CFR 1910.134).

- For field applications check with your supervisor and your safety equipment supplier regarding the appropriate respiratory equipment.
- Where the potential exists for overexposure to **Ammonium Nitrate**, use a NIOSH approved negative pressure, air purifying, particulate filter respirator. The filter classifications of dust/mist/fume, paint spray or pesticide prefilters, and filters for radon daughters, have been replaced with the N, R, and P series. Each series has three levels of filtering efficiency: 95%, 99%, and 99.9%.
- Leave the area immediately if (1) while wearing a filter or cartridge respirator you can smell, taste, or otherwise detect **Ammonium Nitrate**, (2) while wearing particulate filters abnormal resistance to breathing is experienced, or (3) eye irritation occurs while wearing a full facepiece respirator. Check to make sure the respirator-to-face seal is still good. If it is, replace the filter or cartridge. If the seal is no longer good, you may need a new respirator.
- Be sure to consider all potential exposures in your workplace. You may need a combination of filters, prefilters or cartridges to protect against different forms of a chemical (such as vapor and mist) or against a mixture of chemicals.
- Where the potential for high exposure exists, use a NIOSH approved supplied-air respirator with a full facepiece operated in a pressure-demand or other positive-pressure mode. For increased protection use in combination with an auxiliary self-contained breathing apparatus operated in a pressure-demand or other positive-pressure mode.

Fire Hazards

If employees are expected to fight fires, they must be trained and equipped as stated in the OSHA Fire Brigades Standard (29 CFR 1910.156).

- To extinguish fire, flood with water.
- DO NOT USE dry chemical, CO_2 or halogenated extinguishing agents.
- POISONOUS GASES ARE PRODUCED IN FIRE, including *Nitrogen Oxides* and *Ammonia*.
- CONTAINERS MAY EXPLODE IN FIRE.
- Use water spray to keep fire-exposed containers cool.
- **Ammonium Nitrate** may ignite combustibles (wood, paper and oil).

Spills and Emergencies

If employees are required to clean-up spills, they must be properly trained and equipped. The OSHA Hazardous Waste Operations and Emergency Response Standard (29 CFR 1910.120) may apply.

If **Ammonium Nitrate** is spilled, take the following steps:

- Evacuate personnel and secure and control entrance to the area.
- Eliminate all ignition sources.
- Collect with a clean shovel and place into noncombustible containers.
- Ventilate and wash area after clean-up is complete.
- Keep **Ammonium Nitrate** out of a confined space, such as a sewer, because of the possibility of an explosion.
- It may be necessary to contain and dispose of **Ammonium Nitrate** as a HAZARDOUS WASTE. Contact your state Department of Environmental Protection (DEP) or your regional office of the federal Environmental Protection Agency (EPA) for specific recommendations.

Handling and Storage

Prior to working with **Ammonium Nitrate** you should be trained on its proper handling and storage.

- **Ammonium Nitrate** is a STRONG OXIDIZER and when contaminated with OIL, CHARCOAL, or other ORGANIC MATERIALS, can EXPLODE and become SENSITIVE TO SHOCK.
- **Ammonium Nitrate** reacts with STRONG BASES (such as SODIUM HYDROXIDE and POTASSIUM HYDROXIDE).
- **Ammonium Nitrate** is not compatible with REDUCING AGENTS; COMBUSTIBLES; STRONG ACIDS (such as HYDROCHLORIC, SULFURIC and NITRIC); POWDERED METALS; METAL SALTS; OXIDIZING AGENTS (such as PERCHLORATES, PEROXIDES, PERMANGANATES, CHLORATES, NITRATES, CHLORINE, BROMINE and FLUORINE); PHOSPHORUS; UREA; and SULFUR.
- Store in tightly closed containers in a cool, well-ventilated area away from MOISTURE. Containers should be protected from physical damage, shock, heat, and contamination.
- Sources of ignition, such as smoking and open flames, are prohibited where **Ammonium Nitrate** is used, handled, or stored in a manner that could create a potential fire or explosion hazard.
- Wherever **Ammonium Nitrate** is used, handled, manufactured, or stored, use explosion-proof electrical equipment and fittings.

Occupational Health Information Resources

The New Jersey Department of Health and Occupational Health Service, offers multiple services in occupational health. These services include providing informational resources, educational materials, public presentations, and industrial hygiene and medical investigations and evaluations.

For more information, please contact:

New Jersey Department of Health
Right to Know
PO Box 368
Trenton, NJ 08625-0368
Phone: 609-984-2202
Fax: 609-984-7407
E-mail: rtk@doh.nj.gov
Web address:
http://nj.gov/health/workplacehealthandsafety/right-to-know/

The Right to Know Hazardous Substance Fact Sheets are not intended to be copied and sold for commercial purposes.

AMMONIUM NITRATE

GLOSSARY

ACGIH is the American Conference of Governmental Industrial Hygienists. They publish guidelines called Threshold Limit Values (TLVs) for exposure to workplace chemicals.

Boiling point is the temperature at which a substance can change its physical state from a liquid to a gas.

A **carcinogen** is a substance that causes cancer.

The **CAS number** is unique, identifying number, assigned by the Chemical Abstracts Service, to a specific chemical.

CFR is the Code of Federal Regulations, which are the regulations of the United States government.

A **combustible** substance is a solid, liquid or gas that will burn.

A **corrosive** substance is a gas, liquid or solid that causes destruction of human skin or severe corrosion of containers.

DEP is the New Jersey Department of Environmental Protection.

DOT is the Department of Transportation, the federal agency that regulates the transportation of chemicals.

EPA is the Environmental Protection Agency, the federal agency responsible for regulating environmental hazards.

ERG is the Emergency Response Guidebook. It is a guide for emergency responders for transportation emergencies involving hazardous substances.

A **fetus** is an unborn human or animal.

A **flammable** substance is a solid, liquid, vapor or gas that will ignite easily and burn rapidly.

The **flash point** is the temperature at which a liquid or solid gives off vapor that can form a flammable mixture with air.

IARC is the International Agency for Research on Cancer, a scientific group.

Ionization Potential is the amount of energy needed to remove an electron from an atom or molecule. It is measured in electron volts.

IRIS is the Integrated Risk Information System database maintained by federal EPA. The database contains information on human health effects that may result from exposure to various chemicals in the environment.

LEL or **Lower Explosive Limit** is the lowest concentration of a combustible substance (gas or vapor) in the air capable of continuing an explosion.

mg/m^3 means milligrams of a chemical in a cubic meter of air. It is a measure of concentration (weight/volume).

A **mutagen** is a substance that causes mutations. A **mutation** is a change in the genetic material in a body cell. Mutations can lead to birth defects, miscarriages, or cancer.

NFPA is the National Fire Protection Association. It classifies substances according to their fire and explosion hazard.

NIOSH is the National Institute for Occupational Safety and Health. It tests equipment, evaluates and approves respirators, conducts studies of workplace hazards, and proposes standards to OSHA.

NTP is the National Toxicology Program which tests chemicals and reviews evidence for cancer.

OSHA is the federal Occupational Safety and Health Administration, which adopts and enforces health and safety standards.

PEOSHA is the New Jersey Public Employees Occupational Safety and Health Act, which adopts and enforces health and safety standards in public workplaces.

Permeated is the movement of chemicals through protective materials.

PIH is a DOT designation for chemicals which are Poison Inhalation Hazards.

ppm means parts of a substance per million parts of air. It is a measure of concentration by volume in air.

A **reactive** substance is a solid, liquid or gas that releases energy under certain conditions.

STEL is a Short Term Exposure Limit which is usually a 15-minute exposure that should not be exceeded at any time during a work day.

A **teratogen** is a substance that causes birth defects by damaging the fetus.

UEL or **Upper Explosive Limit** is the highest concentration in air above which there is too much fuel (gas or vapor) to begin a reaction or explosion.

Vapor Density is the ratio of the weight of a given volume of one gas to the weight of another (usually *Hydrogen*), at the same temperature and pressure.

The **vapor pressure** is a measure of how readily a liquid or a solid mixes with air at its surface. A higher vapor pressure indicates a higher concentration of the substance in air and therefore increases the likelihood of breathing it in.

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NJ Health
New Jersey Department of Health

Right to Know Hazardous Substance Fact Sheet

Emergency Responders Quick Reference

Common Name: **AMMONIUM NITRATE**

Synonyms: Nitram; Ammonia Nitrate
CAS No: 6484-52-2
Molecular Formula: NH_4NO_3
RTK Substance No: 0106
Description: A colorless to white or gray, crystalline solid or granule

HAZARD DATA

Hazard Rating	Firefighting	Reactivity
2 - Health **0 - Fire** **3- Reactivity** **DOT ID #:** UN 1942 **ERG Guide #:** 140 **Hazard Class:** 5.1 (Oxidizer)	Flood with water. DO NOT USE dry chemical, CO_2 or halogenated extinguishing agents. POISONOUS GASES ARE PRODUCED IN FIRE, including *Nitrogen Oxides* and *Ammonia*. CONTAINERS MAY EXPLODE IN FIRE Use water spray to keep fire-exposed containers cool. Evacuate in all directions for 1,600 meters (1 mile) if fire cannot be controlled. Protect from shock.	**Ammonium Nitrate** is a STRONG OXIDIZER and when contaminated with OIL, CHARCOAL or other ORGANIC MATERIALS, can EXPLODE and become SENSITIVE TO SHOCK. **Ammonium Nitrate** must be stored to avoid contact with REDUCING AGENTS; COMBUSTIBLES; STRONG ACID (such as HYDROCHLORIC, SULFURIC and NITRIC); POWDERED METALS; METAL SALTS; OXIDIZING AGENTS (such as PERCHLORATES, PEROXIDES, PERMANGANATES, CHLORATES, NITRATES, CHLORINE, BROMINE and FLUORINE); PHOSPHORUS; UREA; and SULFUR. **Ammonium Nitrate** reacts with STRONG BASES (such as SODIUM HYDROXIDE and POTASSIUM HYDROXIDE).

SPILL/LEAKS

Isolation Distance: 10 to 25 meters (30 to 80 feet)

Collect with a clean shovel and place in noncombustible containers.
Keep **Ammonium Nitrate** out of a confined space, such as a sewer, because of the possibility of an explosion.
This material may be hazardous to water quality but will biodegrade.

PHYSICAL PROPERTIES

Odor Threshold:	Odorless
Flash Point:	Nonflammable
LEL:	N/A
UEL:	N/A
Density:	1.7 g/cm^3
Water Solubility:	Soluble
Melting Point:	336°F (169°C) Decomposes at 410°F (210°C)
Ionization Potential:	No Information
pH:	5.4

EXPOSURE LIMITS

ACGIH:	N/A
OSHA:	N/A
NIOSH:	N/A
IDLH LEVEL:	N/A
PAC1:	6.7 mg/m^3
PAC2:	73 mg/m^3
PAC3:	440 mg/m^3

PROTECTIVE EQUIPMENT

Gloves:	Butyl or Neoprene
Coverall:	CHEMFAB Challenger® 5200
Boot:	Butyl or Neoprene
Respirator:	N95 for dusts or mists Supplied air for unknown levels or emergency

HEALTH EFFECTS

Eyes:	Irritation and burns
Skin:	Irritation and burns
Acute:	Nose, throat and lung irritation Methemoglobinemia with headache, fatigue and blue color to the skin and lips
Chronic:	Cancer - Not tested No information available

FIRST AID AND DECONTAMINATION

Remove the person from exposure.
Flush eyes with large amounts of water for at least 15 minutes.
Remove contact lenses if worn.
Remove contaminated clothing. Wash contaminated skin with water.
Begin artificial respiration if breathing has stopped and CPR if necessary.
Transfer to a medical facility.

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ANNE XURE 13

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SELECTED TOPIC · Volume 6, Issue 4, P289-293, July-August, 1988

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Ammonium nitrate cold pack ingestion

Kathryn R. Challoner, MD [a,b] · Margaret M. McCarron, MD [a,b]

Affiliations & Notes Article Info

Abstract

Disposable ammonium nitrate cold packs are widely used in emergency departments instead of ice bags. Five confused or suicidal patients who tore open a pack and ingested from 64 to 234 grams of ammonium nitrate in a single dose, and another patient who attempted to do so, are reported. It is known that chronic ingestion of 6 to 12 grams/day of ammonium nitrate may cause gastritis, acidosis, isosmotic diuresis, and nitrite toxicity manifesting as methemoglobinemia or vasodilatation. None of these patients developed severe toxicity, although three had symptoms of gastritis, three had slight methemoglobinemia, and two had mild hypotension. The product was removed from the stomach promptly in three of the five patients. None had pre-existing renal or intestinal dysfunction, which are known to enhance ammonium nitrate toxicity.

This paper is only available as a PDF.

Keywords

ammonium nitrate · cold packs · nitrates · nitrites

The Journal of Emergency Medicine

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ANNEXURE 9
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MINISTRY OF COMMERCE AND INDUSTRY

(Department of Industrial Policy and Promotion)

NOTIFICATION

New Delhi, the 11th July, 2012

G.S.R. 553(E).—Whereas the draft of Ammonium Nitrate Rules, 2011 was published, as required by sub-section (1) of section 18 of Explosive Act, 1884 (4 of 1884) vide notification of the Government of India in the Ministry of Commerce and Industry (Department of Industrial Policy and Promotion) number G.S.R. 694(E), dated the 16th day of September, 2011 in the Gazette of India, Part II, Section 3, Sub-Section (i) inviting objections and suggestions from all persons likely to be affected thereby, before the expiry of a period of forty five days from the date on which the copies of the Gazette containing the said notification were made available to the public;

And, whereas, copies of the said Gazette were made available to the public on 16th September,2011;

And, whereas, objections and suggestions were received from the public on the said draft rules, have been duly considered by the Central Government;

Now, therefore, in exercise of powers conferred by sections 5 and 7 of the Explosives Act, 1884 (4 of 1884) the Central Government hereby makes following rules, namely:-

1. **Short title and commencement—**
   (1) These rules may be called the Ammonium Nitrate Rules, 2012.
   (2) They shall come into force on the date of their publication in the Official Gazette.

CHAPTER I
PRELIMINARY

2. **Definitions** — In these rules, unless the context otherwise requires;-
   (a) **"Act"** means the Explosives Act, 1884(4 of 1884);
   (b) **"Ammonium Nitrate"** means the compound having the chemical formula NH_4NO_3 and includes any mixture or compound having more than 45 percent Ammonium Nitrate by weight including emulsions, suspensions, melts or gels (with or without inorganic nitrates) but excluding emulsion or slurry explosives and non-explosives emulsion matrix and fertilizers from which the Ammonium Nitrate cannot be extracted by any physical or chemical process;

(c) **"Chief Controller"** means the Chief Controller of Explosives;

(d) **"Competent person"** means a person who is adequately experienced and well conversant in safe manufacture, conversion, storage, transportation and handling of Ammonium Nitrate, as the case may be;

(e) **"Controller"** includes the Joint Chief Controller of Explosives, the Deputy Chief Controller of Explosives, the Controller of Explosives and the Deputy Controller of Explosives;

(f) **"Converter"** means a person or an agency which undertakes conversion of solid form of Ammonium Nitrate into melt form or melt form of Ammonium Nitrate into solid form, for other than own use;

(g) **"Conservator"** includes any person or agency or firm acting under the authority of the officer or body of persons appointed to be conservator of a port under section 7 of the Indian Ports Act, 1908 (15 of 1908);

(h) **"District Authority" means,-**

(i) in towns having a Commissioner of Police, the Commissioner or a Deputy Commissioner of Police;

(ii) in any other place, the District Magistrate or Additional District Magistrate;

(i) **"Departmental Testing Station"** means the testing station of the Petroleum and Explosives Safety Organisation;

(j) **"explosive"** means the explosives as defined under clause (d) of section 4 of the Explosives Act, 1884 (4 of 1884);

(k) **"emulsion explosive"** and **"non-explosive emulsion matrix"** shall have the same meaning as defined under the Explosives Rules, 2008;

(l) **"form"** means a Form specified in the Schedules annexed to these rules;

(m) **"licence"** means pre-requisite document to manufacture, convert, import, export, stevedoring and bagging, transport, possess, sale and use of the Ammonium Nitrate;

(n) **"licensing authority"** means authority empowered to issue the licence specified in Schedule I;

(o) **"Occupier"**, in relation to premises means a person who has the control and is responsible for managing the affairs of the premises, and includes, in relation to Ammonium Nitrate, the person in possession of the Ammonium Nitrate:

Provided that in relation to a-

(i) proprietary firm, the proprietor; or

(ii) partnership firm, the partner nominated in writing by all other partners; or

(iii) company, the director nominated in writing by the Board of Directors; or

(iv) Society or association, the office bearer nominated in writing by the governing body,

shall be the occupier;

(p) **"protected works"** includes buildings or structures in which persons dwell, college, school, hospital, theatre, cinema house, shop, office, market, place of storage of hazardous substances, etc. but does not include agricultural wells and pump sets connected therewith;

(q) **"slurry explosive"** and **"Site mixed explosive"** shall have the same meaning as defined under Explosives Rules, 2008;

(r) **"store house"** means independent building meant to possess or store Ammonium Nitrate other than Ammonium Nitrate melt;

(s) **"stevedore"** includes any person or agency or firm which undertakes loading and unloading of bulk Ammonium Nitrate from the ship, its transport to the transit store for its bagging;

(t) **"Safety and Security Management Plan"** means the comprehensive plan for ensuring and managing safety and security in Ammonium Nitrate manufacturing factory, stevedoring, transport, storage and usage premises.

3. Scope of applicability of Rules and exemptions.—

(1) These rules are applicable all over India for regulating the manufacturing, conversion, import, export, stevedoring, bagging, transport, and possession for sale or use of the Ammonium Nitrate.

(2) Nothing in these rules shall apply to the possession, use, transport or import or export of Ammonium Nitrate by -

(a) any of the Armed Forces of the Union and Ordnance Factories or other establishments of such Forces for own use in accordance with the rules or regulations made by the Central Government;

(b) the Indian Railways and its authorised carriers while acting as carrier;

(c) the Port authority;

(d) any person employed under the Central Government or State Government in exercise of any power under the Act or these rules.

(3) Nothing in these rules shall apply to the possession and use of ammonium nitrate of quantity not exceeding five kilograms by the established laboratories, educational institutions, medical institutions, hospitals and health clinics for scientific and educational purpose:

Provided the local police is informed of the quantity under possession for the aforesaid purpose.

CHAPTER II
GENERAL PROVISIONS

4. **Control over manufacture, conversion, stevedoring and bagging, import, export, transport, possession for sale or use of Ammonium Nitrate.**— No person shall undertake manufacture, conversion, stevedoring, import, export, transport or possess for sale or use Ammonium Nitrate except as authorised or licensed under these rules.

5. **Pre-requisite for grant of licence.**— No licence shall be granted unless all the relevant provisions laid down under these rules and all conditions contained in the license forms under Part-2 of Schedule II annexed to these rules are complied with:

Provided that all the existing manufacturers, converters, users, transporters, stevedores, sellers, possessors, importers and exporters shall apply for licence within six months and shall comply with the provisions of these rules within a period of one year from the date of publication of these rules.

6. General Restrictions.—

(1) **Restriction on manufacture -**

The Ammonium Nitrate shall not be manufactured at any place other than the place indicated in the licence.

(2) **Restriction on storage and conversion;–**

(a) The Ammonium Nitrate storehouse shall not be located in populated areas.

(b) No Ammonium Nitrate shall be converted at any place except at converter's premises duly licensed.

(c) No person shall extract Ammonium Nitrate from any fertilizer including by any chemical or physical process.

(3) **Restriction on stevedoring, bagging and possession for sale or use-**

(a) No person shall undertake stevedoring, bagging and possession for sale or use Ammonium Nitrate except under conditions of a licence granted under these rules 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.

(4) **Restriction on import or export–**

(a) No person shall import or export any Ammonium Nitrate except under and in accordance with the conditions of licence granted under these rules;

(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 and declared as Customs Ports by the Commissioner of Customs.

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

(5) **Restriction on transport –**

(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.

(6) **Restriction on delivery or dispatch-**

(a) No person shall deliver or despatch any Ammonium Nitrate to anyone other than a person who-

(i) is the holder of a licence to possess the Ammonium Nitrate or the agent of a holder of such a licence duly authorised by him in writing on his behalf; or

(ii) is entitled under these rules to possess the Ammonium Nitrate without a licence.

(b) The Ammonium Nitrate so delivered or despatched shall in no case exceed the quantity at any point of time for which the person is holding a licence under these rules.

(c) No person shall receive Ammonium Nitrate from any person other than the holder of a licence granted under these rules.

(7) **Restriction on handling Ammonium Nitrate.—** No person shall handle or cause to be handled any ammonium Nitrate between the hours of sunset and sunrise:

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.

(8) **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 manufacture, conversion, bagging, storage, sale, loading, unloading or transport of Ammonium Nitrate or to enter any premises permitted under these rules.

(9) **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 manufacture, conversion, bagging, storage, import, export, transport or handling of Ammonium Nitrate.

(10) **Restriction on use.**—Ammonium Nitrate shall not be used for blasting either alone or in combination with other ingredients unless permitted under the Explosives Rules, 2008.

7. Employment of competent person.—

(1) No Ammonium Nitrate shall be manufactured or converted except under supervision of a competent person.

Explanation. - The competent person referred to in sub-rule (1) shall be a person with degree or diploma in engineering or graduate in science having minimum five years' experience in chemical or explosives industry as an essential qualification and diploma in industrial safety as an optional qualification and shall be employed by the licensee to ensure compliance of safety norms for manufacture and conversion of the Ammonium Nitrate.

(2) All operations associated with stevedoring, bagging, handling, transport and use of Ammonium Nitrate in any building or part thereof shall be carried out under the supervision of a person employed by the licence holder who is conversant with the process thereof and the hazards connected therewith and the provisions of these rules.

8. Packing of Ammonium Nitrate.—No person shall import, export, transport, possess or sell Ammonium Nitrate unless;

(a) it is duly packed in a suitable waterproof bag or container or is suitably bagged by stevedore or converter;

(b) the container or package is marked in accordance with the provisions of rule 8;

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

(d) the packages of Ammonium Nitrate for export or import conform to the requirements of the tests as specified under International Maritime Dangerous Goods Code (hereinafter referred to as the IMDG Code in these rules) or United Nations recommendations on the transport of Dangerous Goods.

9. Marking on Ammonium Nitrate packages.—

(1) Each bag or container 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 licence number of manufacturer or converter or importer;

(d) identification number of the package or bar coding;

(e) the net weight of Ammonium Nitrate;

(f) gross weight of the package;

(g) date of bagging and batch number;

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

(2) 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.

10. Recovery of Spillage during handling.— If any spillage occurs during the process of handling of Ammonium Nitrate 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.

11. Special precautions against accident.—

(1) No person shall commit or attempt to commit any act which may tend to cause a fire or explosion in or about any place where the Ammonium Nitrate is manufactured, converted, bagged, stored or transported.

(2) Every person possessing Ammonium Nitrate and every person in charge of or engaged in the import, export, manufacture, conversion, bagging, sale, transport or handling of the Ammonium Nitrate shall at all times comply with the provisions of these Rules and the conditions of the licence relating thereto and observe all due precautions for the prevention of thefts or accidents by fire or explosion.

(3) The premises used for storage of the Ammonium Nitrate shall not be used for storage of any other materials including fertilizers.

(4) Every person shall prevent any other person from committing any such act as is prohibited under sub-rule (1)

12. Restriction on unauthorised persons, provision of guards and safety distance for storehouse.—

(1) The licence holder shall at his own expense provide security guards for safe custody of Ammonium Nitrate stored in a storehouse.

(2) For the purposes of sub-rule (1), the security guards shall be of such strength as the District Authority may consider it to be sufficient.

(3) The premises used for manufacture of the Ammonium Nitrate or conversion of the melt into solid form of Ammonium Nitrate or vice versa and the storehouse shall be surrounded by a wall of at

least two metres height of such strength and construction as to effectively prevent entry of unauthorised persons.

(4) (a) The Ammonium Nitrate storehouse shall maintain;

(i) for storage not exceeding 30 MT, Safety Distance of 4.5 metres from store house to the compound wall and 45 metres from any protected works;

(ii) for storage exceeding 30 MT, Safety Distance of 9 metres from store house to the compound wall and 90 metres from any protected works;

(b) the storehouse may be adjacent to the bagging unit of the manufacturing, conversion or explosives or nitrous oxide manufacturing plants, but shall observe the provisions of clauses (i) and (ii) of sub-rule (a) of rule 4.

Note: The safety distance shall be measured from the edge of the storehouse.

(5) (a) The storehouse shall be;

(i) constructed at ground level without any mezzanine floor, upper floor or any basement;

(ii) with the floor(plinth) level not less than forty five centimetres from the ground level and well ventilated;

(iii) with at least 23 centimetres thick walls built of brick or stone mortar, or concrete and with roof of RCC or Asbestos or Fibre or GI sheet;

(iv) with sufficient numbers of doors made of steel of minimum three millimetres thick and opening outwards;

(b) Notwithstanding anything contained in sub-clause (iii) storehouse of stevedore may be a shed without side walls.

(6) Any storehouse used for possession for sale or possession for use of Ammonium Nitrate shall have a floor area not less than one square metre per Metric Tonne of Ammonium Nitrate and the

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Disaster Med Public Health Prep. 2020 Nov 18:1–5. doi: 10.1017/dmp.2020.451

Beirut Ammonium Nitrate Explosion: A Man-Made Disaster in Times of the COVID-19 Pandemic

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Author information Article notes Copyright and License information

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Abstract

The largest non-nuclear blast in modern history took place on August 4, 2020, at 6:07 PM in Beirut, Lebanon, after an estimated 2750 tons of unsafely stored ammonium nitrate exploded. The physical and social impacts of this catastrophic event coinciding with the coronavirus disease (COVID-19) pandemic were massive. This article describes the national and international emergency responses to this event and highlights the impact of the explosion on the health care sector in Lebanon. Challenges noted during this response with recommendations for improving response to future disasters are also described.

Keywords: ammonium nitrate, Beirut, COVID-19 pandemic, disaster response, explosion

Event

The largest non-nuclear explosion in modern history took place on August 4, 2020, at 6:07 PM in Beirut, Lebanon. This catastrophic event started 30 minutes earlier with a fire in a large hangar where fireworks and an estimated 2750 tons of ammonium nitrate were unsafely stored in an urban setting in the capital of Lebanon.[1] Several small explosions were followed by a massive

explosion that resulted in over 6000 injured, 200 fatalities, and over 100 missing casualties. It also destroyed a major part of the city with an estimate of over US $10 billion in infrastructure damage leading to over 300 000 displaced individuals. At the time of this report, the direct cause of this incident was still being investigated and theories ranged from a deliberate attack on the storage site to an accidental explosion of a large volume of explosive chemical material stored in an unsafe manner. The chemical cargo was present in the hangar for over 6 years after the Lebanese Port authorities confiscated it from a ship that entered the port to transport additional cargo but, for presumed technical reasons, the chemical cargo was unable to proceed with its journey from Georgia to Mozambique.

Initial Response

The fire in the hangar prompted the Beirut Fire Department to respond to the incident site with first responders unaware of the presence of explosive material in the Hangar. The fire, which was filmed by many bystanders, was followed by a large explosion and a blast wave that was felt across Beirut. The explosion was heard over 200 km in the island of Cyprus and registered seismic waves equivalent to a magnitude of a 3.3 earthquake.[2]

Prior to the blast, there were no notifications to public or to other agencies to allow for population protection in terms of rapid evacuation or sheltering in place.[3] This event immediately overwhelmed the ability of Beirut hospitals, emergency medical services (EMS) agencies, first responder agencies, and other responding agencies to mount an effective response. Casualties flooded local hospitals with the less injured arriving first by private transportation or by walking to nearby hospitals and the more injured arriving later by EMS vehicles. EMS agencies headquarters and vehicles in Beirut were also affected by the blast. Initial communication between hospitals and between hospitals and EMS was lacking since all hospitals within a 5-mile radius from the explosion site were affected at the same time. Patients presented mainly with blast injuries seen with high order explosives. These included traumatic brain injuries, penetrating and blunt injuries from glass and flying debris, globe (eye) injuries, and musculoskeletal injuries (including fractures and contusions). Very few patients presented with burns. Patients with minimal injuries visited several hospitals before being attended to.

Scaling Up of Response

The Government of Lebanon, realizing the massive impact of this incident, declared a state of emergency and launched an immediate appeal for disaster assistance to the international community. At the same time, the Lebanese Army formed an incident command structure that would oversee the disaster response activities, including operations, logistics, planning, and finance and administration. This response model was previously described in an article evaluating national

emergency response to mass casualty incidents in Lebanon[4] and recommending the adoption of principles of the US National Incident Management System.[5] Drills were also conducted in previous years in collaboration with non-governmental organizations (NGOs) and the United Nations Interim Force in Lebanon.

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Initial Disaster Operations

The Lebanese Army secured the blast area perimeter to allow for investigation teams and for search and rescue operations to proceed immediately after the blast. The Beirut Municipality was tasked in coordination with the High Relief Commission to assess damages in affected areas of Beirut. The Internal Security Forces were designated as the main agency to help with searching for missing individuals and to conduct forensic/DNA identifications of unidentified victims/body parts in coordination with the Lebanese Red Cross. They were also charged with maintaining security and safety in affected areas by preventing looting and theft from partly destroyed houses and businesses.

A liaison committee was also formed between the Lebanese Army and the Ministry of Health to prioritize medical needs and to oversee donations and coordinate the timely delivery of resources.

The incident command center also asked media outlets to rely only on official communications released by designated media liaison officers. A dedicated call center was launched for all public inquiries related to the response activities. Another task force was assigned to work on disaster recovery activities, including resuming operations in the unaffected part of the port to allow for receiving international assistance. Beirut International Airport was also designated as the main site for receiving international assistance teams and resources.

Response Priorities

Search and Rescue Operations

Search and rescue operations for missing individuals at the blast site were the initial response priority. The initial operations were conducted by the Lebanese Civil Defense (main government agency tasked with urban search and rescue), the Lebanese Army, and other responding agencies. Several international teams arrived to Lebanon the day after the explosion and were assigned specific sectors and initiated work on-site with advanced equipment and rescue dogs. The blast site map identified at least 7 international teams from Russia, France, Poland, Qatar, Netherlands, Greece, and Czech Republic. Other teams, including the Turkish team, arrived a few days later and started working on the expanded blast site. An initial estimate of over 100 individuals missing was reported after the blast.

Health Care Sector Impact Assessment

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A quick assessment of the impact of the event on the health care system, addressing the needs of the injured, and regaining the pre-incident capacity of the system were the main medical priorities. The direct physical impact on the health care system consisted of damages to hospitals and to other health care entities: Three major hospitals (St. George Hospital University Medical Center, Wardieh Hospital, and Karantina Hospital) became completely nonfunctional resulting in the total loss of approximately 500 beds. Three other hospitals sustained partial damage (Geitawi Hospital, LAU Medical Centre–Rizk Hospital, and American University of Beirut Medical Center).[6] The largest national stock of medications was also partly affected and 17 containers of medical supplies located at the port were partly destroyed. Several medical providers were also among the blast victims with several deaths reported from hospitals that were close to the blast site. According to the Lebanese Order of Physicians, over 2000 doctors' offices and clinics were also affected by the explosion.

At the time of the blast, the health care sector in Lebanon was already experiencing tremendous challenges in terms of capacity and resources. A deepening economic and financial crisis that started in 2019 caused several health care organizations to reduce their operations and their workforce in order to cope with currency devaluation, price inflation, and capital control measures that were implemented.[7] Most hospitals were also prioritizing preparedness for the coronavirus disease (COVID-19) pandemic with 4022 cases registered in Lebanon 1 day before the blast.[8]

Despite all of these challenges, local hospitals received over 6000 casualties and depleted most of their supplies to respond to this disaster. Hospitals that were severely hit during the blast had to relocate their patients to other facilities, which resulted in increased occupancy in most hospitals in Beirut and reduced their ability to cope with a concurrent surge in COVID-19 cases requiring hospitalization. Caring for patients during this response compromised precaution practices that were implemented in most hospitals related to the COVID-19 pandemic, such as removing COVID-19 screening and testing requirements and reduced personal protective equipment (PPE) standards during advanced airway management.

Field hospitals were part of the international assistance and mutual aid delivered by other countries.[9] By August 12, 2020, there were at least 5 international hospitals operating in the greater Beirut area: Most were set up to operate independently and were run by military health care teams. These included the Russian, Jordanian, Moroccan, and Iranian hospitals. The Qatari hospital was set up to support the functions of St. George Hospital, which was located near the blast site. Most had general capabilities for treating injured victims and providing minor surgeries with few intensive care beds available in the Iranian and Qatari hospitals. Two hospitals also had laboratory COVID-19 polymerase chain reaction (PCR) testing (Russian and Jordanian) and

ANNEXURE 16

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INDUSTRIAL SAFETY

Chinese Investigators Identify Cau Tianjin Explosion

Safety: Investigators make recommendations, spread blame around

by Jean-François Tremblay
February 8, 2016

A new report by China's top governing body identifies the cause of an explosion at a hazardous goods warehouse in Tianjin's harbor in August of 2015. The catastrophe killed 165 people.

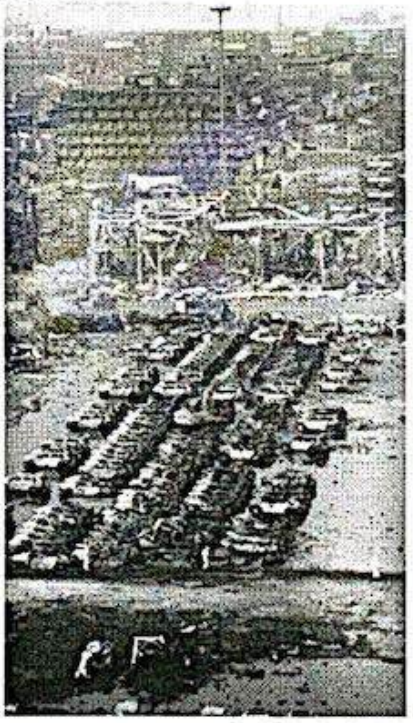
Assigning responsibility far and wide, investigators blamed the disaster on the negligence or corruption of 123 people in addition to the 49 previously arrested.

The immediate cause of the accident was the spontaneous ignition of overly dry nitrocellulose stored in a container that overheated, according to the report, issued on Feb. 5. Wetting agents inside the container had evaporated in the summer heat, investigators found. Flames from that initial fire reached nearby ammonium nitrate fertilizer, which exploded.

Investigators determined that the accident had a fairly limited impact on the local environment. Marine life in Bohai Bay, outside Tianjin, was not affected, the investigation found. And although hundreds of tons of sodium cyanide were stored at the warehouse, no one died from poisoning, the report added. Investigators noted that local authorities are still monitoring environmental quality in the area.

MAN-MADE DISASTER

[+]Enlarge



Credit: Imaginechina/AP

The Tianjin explosion killed 165 and caused more than $1 billion in damage.

The investigative team, assembled under the authority of the State Council—China's top decision-making body—consisted of some 600 officials from agencies such as the Ministry of Environment, the State Administration of Work Safety, and the Supreme People's Procuratorate, China's top investigative body. They reviewed thousands of documents and had access to 100,000 hours of surveillance footage, **reported Xinhua**, a state news agency.

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Investigators found that Tianjin Ruihai International Logistics, the operator of the warehouse, illegally stored hazardous materials and that its "safety management procedures were inept." It also assigned varying degrees of blame to 74 government officials from agencies at the municipal, provincial, and national levels. Some officials, investigators found, were guilty of "taking bribes and abusing power."

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To prevent a similar catastrophe, investigators issued a list of recommendations, including the creation of a national system for monitoring hazardous chemicals storage. They also recommended that firefighters be better equipped. First responders accounted for 110 of the dead.

Responding to the report, the environmental group Greenpeace said it did not go far enough, noting that hundreds of serious industrial accidents happen in China every year. "Noncompliance and negligence on the part of companies and local administrations are among the root causes of these alarmingly frequent chemical accidents," the group said. It called on the government to create a comprehensive system to oversee the manufacture, use, transportation, storage, and treatment of hazardous chemicals.

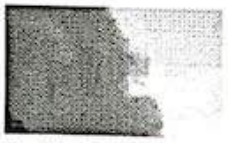
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ANNEXURE - 17

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VISAKHAPATNAM PORT TRUST
TRAFFIC DEPARTMENT
SAFETY, HEALTH,ENVIRONMENT & QUALITY INTEGRATED MANAGEMENT SYSTEM

Location : SOP **Title:** Work Instructions

CODE : ITRA/SOP/WI -24

AMMONIUM NITRATE

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 standby 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 equipment's.
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, Hypochlorite's, 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, sisal, 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.

ANNEXURE-18

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VISAKHAPATNAM PORT AUTHORITY
TRAFFIC DEPARTMENT

No: ITRA/SHP/FAMN
Dt. 07-11-2024

To
The Chief Inspector of Dock Safety
Vyavasayik Suraksha aur Swasthya Bhavan,
NS Maniki kar Marg, Sion
Mumbai, Maharastra-400 022.

Sir,

Sub: Report on Adequacy of safety measures by Visakhapatnam Port Authority at Visakhapatnam port, Visakhapatnam for import and handling of Ammonium Nitrate-reg

Ref: 1) APPCB Letter No. 724/APPCB/HO/ECS/VPT/2024, Dt. 25-09-2024
2) DGFASLI report dated 09-09-2024 on adequacy of safety measures by VPA for import and handling of Ammonium Nitrate

In reference the letter 1st cited, APPCB had directed this Port to comply with the points raised by DGFASLI in their report 2nd cited. The remarks of VPA for the points raised by DGFASLI in their report are enclosed herewith.

VPA once again assures that the recommendations given by DGFASLI in the Report on various issues related to handling of Ammonium Nitrate vessels shall be complied in toto. Adequate safety measures are being taken by Visakhapatnam Port Authority for import and handling of Ammonium Nitrate, when compared to any other Ports in the East coast

Also, it is pertinent to mention that Ammonium nitrate is handled at dedicated berths of VPA i.e., EQ3, EQ4, EQ6 and EQ7. Signage are already provided for individual berths along with route maps for cargo movement whenever ammonium nitrate vessel berths. Ammonium Nitrate storage is not permitted in the VPA premises. However during handling of Ammonium Nitrate Fire tender with Fire crew will be kept standby to tackle/prevent the spread of Fire. Moreover as per requirement another 4 Nos of VPA Fire Tenders and 3 Nos Firefighting tugs which are having sea suction will be deployed to combat any quantum of Fire. Further to inform that if any additional requirement, will seek the assistance of District Crises Management group, State Fire brigade, NDRF, NDMA and neighbouring industries.

It is not out of place to mention that, there was no instance of any untoward incident during handling of Ammonium Nitrate at VPA during the past many years. In view of the above, you are requested to forward the same to APPCB so as to enable them to issue NOC to VPA for handling import Ammonium Nitrate (Fertilizer Grade) vessels at VPA.

Encl:-As above.

Yours sincerely,

TRAFFIC MANAGER i/c

Copy to:- The Asstt. Director (Safety), Inspectorate Dock Safety, Ex. DI.B Building. 5th floor, Port Area, Visakhapatnam for information and necessary action.
Copy to:- CME/VPA for information and necessary action to co-ordinate with Assistant Director (Dock Safety).
Copy to:- Safety Officer/VPA for information and necessary action to co-ordinate with

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Report on Adequacy of Safety Measures by Visakhapatnam Port Authority at Visakhapatnam Port for Import and Handling of Ammonium Nitrate

Sl.No.	Findings No	Committee findings	Issue Details	Implications	Justification	Recommended Actions	Deparment	VPA Remarks
3.1 (1)	3.1	**Lack of Dedicated Transportation and Route Management**	No dedicated vehicles.for Ammonium nitrate dispatch: The use of non-specialized vehicles for transporting Ammonium nitrate increases the risk of contamination and mishandling. This oversight can lead to accidents or unintended chemical reactions.	Risk of Contamination and Accidents: Using generic vehicles not designed for hazardous materials increases the risk of contamination and accidental spillage. This can lead to severe chemical reactions, fires, or explosions, especially if ammonium nitrate comes into contact with incompatible substances	Regulatory Requirements: Regulations typically mandate that hazardous materials like ammonium nitrate must be transported using specialized vehicles that meet specific 19 safety criteria, including isolation and containment features. Additionally, international best practices recommend using designated routes to minimize risk.	Implement Dedicated Vehicles: Acquire or designate specific vehicles for transporting ammonium nitrate that meet international safety standards.	TM	This port donot engage vehicles for transportation of cargo that is imported or exported through this port. The vehicles ar engaged by the Stevdores / importer. The Stevedores / Importers shall be insisted to engage dedicated vehiocles as recommended
3.1 (2)			No dedicated route or signage for Ammonium nitrate transportation: The absence of a dedicated route exposes other road users and areas to unnecessary risk. Lack of signage means that those transporting the material may not be aware of the safest paths or protocols.	Exposure to Unintended Recipients: Without dedicated routes, ammonium nitrate might be transported through populated or high-traffic areas, increasing the risk of exposure to the general public.	Regulatory Requirements: Regulations typically mandate that hazardous materials like ammonium nitrate must be transported using specialized vehicles that meet specific 19 safety criteria, including isolation and containment features. Additionally, international best practices recommend using designated routes to minimize risk.	Establish Designated Routes and Signage: Develop and clearly mark routes dedicated to hazardous material transport, with appropriate signage to guide drivers and inform the public.	TM	Ammonium nitrate is handled at dedicated berths of VPA i.e., EQ3, EQ4, EQ6 and EQ7. All the vehicles designated for the subject berths move towards any one of the two gates i.e., MG gate or EQ7 gate. Signages are already provided for individual berths along with route maps for cargo movement. whenever ammonium nitrate vessel berths, specific directions and designated routes are provided to the vehicles.
3.1 (3)			No barriers or separation measures: Without physical barriers to separate ammonium nitrate from other goods or traffic, there's a risk of collision or exposure to incompatible substances.	Inadequate Traffic Management: The lack of barriers and clear separation increases the chances of vehicular accidents involving ammonium nitrate, which could have catastrophic consequences.		Install Barriers and Safety Measures: Physical barriers should be installed on routes used for transporting ammonium nitrate to prevent accidental collisions and ensure safer transportation corridors.	TM	Whenever Ammonium Nitrate vessel is berthed at a specific berth, that berth is isolated from movement of other vehicles and temporary barricates are set up to separate the movement of vehicles carrying other cargoes.
3.2 (1)	3.2	**Safety and Emergency Measures**	No fire separation systems: Fire separation systems are absent in areas where ammonium nitrate is stored or handled. This poses a significant risk of fire spreading to these areas, leading to potential explosions.	High Risk of Fire and Explosions: Without fire separation systems, there is an increased risk of fire spreading rapidly to ammonium nitrate storage areas, which could lead to devastating explosions.	Regulatory Compliance: Many international safety regulations require the implementation of fire separation systems in areas where hazardous materials are stored. The failure to comply with these regulations can lead to severe penalties and increased liability in the event of an incident.	Install Fire Separation Systems: Implement appropriate fire separation systems in all areas where ammonium nitrate is stored or handled to prevent the spread of fire.	DC	Ammonium Nitrate storage is not permitted in the VPA premises. However during handling of Ammonium Nitrate Fire tender with Fire crew will be kept standby to tackle/pevent the spread of Fire. Moreover as per requirement another 4 Nos of VPA Fire Tenders and 3 Nos Fire fighting tugs which are having sea section will be deployed to combat any quantam of Fire. Further to inform that ifr any additional requirement, will seak the assistance of District Crises Management group, State Fire brigade, NDRF, NDMA and neighbouring industries.
3.2 (2)			Lack of emergency plans specific to ammonium nitrate: Emergency plans do not address the unique hazards associated with ammonium nitrate, which require specialized knowledge and protocols	Unpreparedness in Emergencies: In the absence of specific emergency plans for ammonium nitrate, response teams might not be adequately prepared to handle situations involving its unique properties, such as its ability to act as an oxidizer and accelerate fires.	Precedents: The Beirut Port explosion in 2020, caused by improperly stored ammonium nitrate, highlights the importance of having robust safety and emergency measures in place.	Develop Specific Emergency Plans: Create and regularly update emergency response plans tailored to the risks associated with ammonium nitrate, including training for all staff.	DC	Specific emergency plan is prepared basing on the risks assoicted with Ammonium Nitrate handling and copy of thhe same is enclosed
3.2 (3)			Poor display of Material Safety Data Sheets (MSDS): MSDS are either not displayed or not easily accessible in critical areas where ammonium nitrate is handled, stored, or transported.	Inadequate Information for Safe Handling: The lack of accessible MSDS means that workers might not have immediate access to crucial information needed for safe handling, storage, and emergency response, increasing the risk of accidents.	Best Practices: International standards such as the NFPA (National Fire Protection Association) guidelines provide detailed requirements for fire safety, emergency planning, and the display of safety information like MSDS.	Ensure Visibility and Accessibility of MSDS: Make MSDS readily available and visible in all areas where ammonium nitrate is present to ensure that workers can quickly access safety and emergency information.	DC	During handling of Ammonium Nitrate MSDS will be displayed at the spot

3.3 (1)	3.3	**Insufficient Training and Competency Assessment**	No regular training updates or specialized programs for chemical handling: Workers handling ammonium nitrate lack updated training or specialized programs that focus on the unique properties and risks of ammonium nitrate.	Increased Risk of Improper Handling: Without regular and specialized training, workers may not fully understand the dangers associated with ammonium nitrate, increasing the likelihood of accidents due to improper handling or storage.	Regulatory Expectations: OSHA (Occupational Safety and Health Administration) and similar bodies require that workers handling hazardous materials receive specific training and demonstrate competency in their tasks.	Implement Regular Training Programs: Develop and mandate participation in regular training sessions focused on the handling, storage, and emergency response for ammonium nitrate.	DC/CME/TM/CMO	Trainings arranged by HRDC for Stevedores, Agencies/ Private Parties. The workers engaged in handling of AN are the regular Staff employee of concerned agency. However, Port management ensures that the trained Dock Workers are engaged for handling of Ammonium Nitrate at Port.
3.3 (2)			No mechanism for competency assessment: There is no formal process to evaluate the competency of workers handling ammonium nitrate, leading to a potential mismatch between the required skills and actual capabilities.	Lack of Preparedness for Emergencies: Untrained personnel may not respond correctly during an emergency, potentially exacerbating the situation and increasing the risk of injury or death	Precedents and Case Studies: Incidents like the Tianjin explosions in 2015 demonstrate the catastrophic outcomes when personnel are not adequately trained in handling hazardous materials.	Establish Competency Assessment Mechanisms: Create formal competency assessment programs to evaluate the skills and knowledge of all personnel involved in the handling of ammonium nitrate.	DC/CME/TM/CMO	SOP's & procedure for handling Ammonium Nitrate at Visakhapatnam Port is already prepared circulated and, prior to arrival of vessel at Port, the standing instructions are issued to the Safety, Fire & OHC department. possess valid license for handling of Ammonium Nitrate i.e Un-loading and Transporting. SOPs are explained to Stevedores and involved Workers. Class Room/ Onsite Trainings are also ensured.
3.3 (3)			Absence of programs for hazardous material handling certification: Workers are not certified in hazardous material handling, meaning they may not be fully aware of the best practices or regulatory requirements for safely managing ammonium nitrate.	Non-Compliance with Regulatory Standards: The absence of certification programs and competency assessments can lead to non-compliance with regulatory standards, exposing the port authority to legal and financial repercussions.	Best Practices: Regular training and competency assessments ensure that all personnel are aware of current best practices and can handle materials like ammonium nitrate safely and efficiently.	Introduce Certification Programs: Launch certification programs for hazardous material handling, ensuring that all relevant personnel are properly trained and certified according to international safety standards.	DC	Trainings & Certification by DGFASLI for Stevedors / Agencies and Cargo Handlers Fire staff have been under gone CBRN certification tainng and periodical refresh training is being given for handling of hazards chemicals including of Ammonium Nitrate
3.4 (1)	3.4	**Poor Maintenance and Inspection Protocols**	No maintenance and replacement protocols for equipment: There are no established procedures for the regular maintenance and replacement of equipment used in handling ammonium nitrate.	Equipment Failures and Accidents: Without proper maintenance and inspection protocols, equipment failures can occur, leading to spills, leaks, or accidents involving ammonium nitrate.	Regulatory Requirements: International regulations and guidelines require regular maintenance, inspection, and safety audits to ensure that equipment is functioning correctly and that safety measures are adequate.	Develop Maintenance Protocols: Establish detailed maintenance and replacement protocols for all equipment used in handling ammonium nitrate, ensuring regular checks and timely replacements.	TM	Regular inspections are carried out by the Port environment Cell, Fire Officer, Safety Officer and Traffic Officials during the atayal of the vessel carrying Ammonium Nitrate at berth. Berths are being maintained clean and tidy with safety standards.
3.4 (2)			Inadequate inspection systems. The inspection systems in place are either insufficient or infrequent, leading to potential undetected wear and tear or malfunctioning equipment.	Undetected Safety Hazards: Infrequent inspections may fail to detect safety hazards in a timely manner, allowing minor issues to escalate into significant problems.	Case Studies and Best Practices: Historical incidents, such as the Enschede fireworks disaster (2000), show the consequences of failing to maintain equipment and conduct regular safety audits.	Implement Frequent Inspection Systems: Conduct frequent inspections of all facilities and equipment to ensure compliance with safety standards and identify potential risks.	DC/CME/TM	VPA Conducting regular Inspections on safety measures in port area. Prior to arrival of vessel at Port, the standing instructions are issued to the Safety, Fire & OHC department. While handling of cargo and Ammonium Nitrate and rectify the safety problems.
3.4 (3)			Lack of regular safety audits. There are no scheduled safety audits to review and assess the effectiveness of current safety measures and identify areas for improvement.	Non-compliance with International Standards: The lack of regular safety audits means that the port authority may not be adhering to international safety standards and regulations, potentially leading to legal consequences.	Risk Management: Regular inspections and audits are critical for identifying potential risks and implementing corrective measures before incidents occur.	Schedule Regular Safety Audits: Perform regular safety audits to evaluate the effectiveness of safety measures, compliance with regulations, and areas needing improvement.	DC/CME	Safety Audit for handling Ammonium Nitrate at VPA was also conducted during October 2022 by DGFASLI. The recommendation is being complied on progressive basis. VPA conducted safety audit by Third party M/s. IRQS in the month Of MAY 2024 and Internal Audits also being conducted for every quarterly for Occupational Environment, Health & safety (ISO 9001, 14001 & 45001).
3.5 (1)	3.5	**Non-compliance with Safety Regulations and Documentation**	Missing onsite and disaster management plans. The onsite and disaster management plans are incomplete or missing critical details specific to ammonium nitrate handling and emergencies.	Unpreparedness for Emergencies: Without comprehensive disaster management plans, there is no clear guidance for emergency response, leading to potential chaos and increased risk during an incident.	Regulatory Compliance: Compliance with safety regulations, including thorough documentation and disaster planning, is mandatory to ensure safe handling of hazardous materials and mitigate risks.	Develop Comprehensive Disaster Management Plans: Create detailed disaster management plans that address the specific risks associated with ammonium nitrate and outline clear procedures for emergencies.	DC	Comprehensive Risk assesment study with respect to Ammonium Nitrate handling has been carried out through 3rd party agency and accordingly Disaster Management Plan is prepared copy of the ame is enclosed.

3.5 (2)			Insufficient record-keeping: There is a lack of proper documentation and record-keeping regarding safety procedures, incidents, and compliance efforts.	Lack of Accountability and Continuous Improvement: Insufficient record-keeping makes it difficult to track compliance, learn from past incidents, and implement improvements.	Best Practices: International best practices emphasize the importance of comprehensive emergency planning and meticulous record-keeping to ensure accountability and continuous improvement in safety management.	Improve Record-Keeping Practices: Implement robust record-keeping systems to document all safety procedures, incidents, and compliance efforts, ensuring transparency and accountability.	DC/CME	All safety procedures, incidents, and compliance efforts are communicated to IDS vskp to ensure transparency and accountability.
3.5 (3)			Non-compliance with safety evaluations and regulations: The port authority has not conducted required safety evaluations or adhered to regulations for hazardous material handling.	Legal and Financial Consequences: Non-compliance with regulations can lead to significant fines, legal actions, and reputational damage, affecting the port's operations and credibility.	Precedents: The Seveso disaster (1976) in Italy led to the establishment of the Seveso Directive, which highlights the importance of detailed safety documentation and compliance to prevent accidents.	Ensure Compliance with Safety Regulations: Conduct regular safety evaluations and ensure adherence to all regulations and standards for hazardous material handling.	DC/CME	Regular & periodic inspection are made to cargo handling areas so as to ensure the statutory requirements of Safety measures at the Port. IDS Visakhapatnem also inspects the Dock Area, Conduct regular safety evaluations and ensure adherence to all regulations and standards for hazardous material handling.
3.6 (1)	3.6	**Lack of Emergency Response and Medical Preparedness**	No Incident Response Mechanism for Ammonium Nitrate: There is no specific incident response mechanism in place for emergencies involving ammonium nitrate, such as spills, leaks, or explosions.	Delayed Emergency Response: The absence of a dedicated response mechanism and rapid deployment procedures can lead to delays in emergency response, which can exacerbate the severity of an incident involving ammonium nitrate.	Regulatory Standards and Best Practices: Regulatory bodies such as OSHA and the International Maritime Organization (IMO) mandate specific emergency response protocols for hazardous materials like ammonium nitrate. Best practices include having a dedicated incident command center and trained response teams to ensure a swift and effective response.	Establish an Incident Response Mechanism: Develop and implement a specific incident response plan tailored to the unique risks associated with ammonium nitrate, including clear protocols for spills, leaks, and explosions	CMO	VPA have a comprehensive On-site and Off-site emergency plan and the same was updated in the month of May 2024 Medical department is having an emergency management plan to initiate and deal with ammonium nitrate related incidents like spills leaks and explosions.
3.6 (2)			Insufficient Medical Facilities and Training: The medical facilities near the port are inadequate for responding to hazardous chemical emergencies, and there is a lack of trained medical personnel who are familiar with the hazards of ammonium nitrate.	Inadequate Medical Response: Without properly trained medical personnel and adequate facilities, the port is ill equipped to handle injuries or health complications resulting from ammonium nitrate exposure, putting workers and nearby residents at risk.	Case Studies and Incidents: The Tianjin explosions in 2015, which involved hazardous chemicals, demonstrated the need for a rapid, well-coordinated emergency response. The lack of preparedness and training contributed to the high number of casualties and extensive damage.	Enhance Medical Training and Facilities: Train medical personnel in handling chemical exposure and establish adequately equipped medical facilities to handle emergencies involving ammonium nitrate.	CMO	First aid trainings are being conducted and will be focused on the handling of ammonium nitrate and other chemical explosives as a health hazard like exposures ,spills ,absorption and ingestion and providing immediate first aid like cleaning of the effected areas with water, inducing vomiting ,shifting the affected person to fresh air ,oxygen inhalation ,treating with methylene blue injection and to initiate CPR whenever required.
3.6 (3)			No Rapid Deployment Procedures or Command Center: There is no established command center or procedures for rapid deployment in the event of an ammonium nitrate-related incident, which would be critical for coordinating emergency responses.	Uncoordinated Efforts During Crises: The lack of a command center and clear communication channels can result in uncoordinated efforts during a crisis, leading to confusion, increased damage, and potentially loss of life.	Risk Mitigation: A robust emergency response mechanism, including a trained medical team and established command center, is critical to minimizing the impact of any incident and ensuring the safety of both workers and the community.	Create a Command Center and Rapid Deployment Procedures: Set up a dedicated command center to coordinate responses during emergencies and develop rapid deployment procedures to ensure a swift and effective response.	CMO	As part of VPA command centre and rapid deployment procedures, medical department has a dedicated emergency response team for the coordinated response during emergencies and incidents to ensure a swift and effective response to arrange and utilise the necessary first aid materials and anti dotes and to triage the affected persons to provide immidiate medical care and for transportation of severely affected patients to the local empanelled
3.7 (1)	3.7	**Inadequate Fire Safety Measures**	Absence of Fire Suppression Systems: There is no installation of automatic fire suppression systems specifically designed for areas where ammonium nitrate is stored or handled.	Increased Risk of Fire Spread: Without proper fire suppression systems, a fire in the vicinity of ammonium nitrate can quickly spread, leading to possible explosions and extensive damage.	Safety Standards and Codes: Fire safety standards such as those from NFPA (National Fire Protection Association) require specific suppression systems and regular drills to prepare for hazardous material incidents. Adherence to these standards is crucial for minimizing fire risks.	Install Fire Suppression Systems: Implement automatic fire suppression systems specifically designed for ammonium nitrate storage areas, such as water deluge systems that can prevent fire spread.	DC	Ammonium Nitrate is not permitted in theom VPA premises. However during handling of Ammonium Nitrate Fire tender with Fire crew will be kept standby to tackle/pevent the spread of Fire. Moreover as per requirement another 4 Nos of VPA Fire Tenders and 3 Nos Fire fighting tugs which are having sea section will be deployed to combat any quantam of Fire. Further to inform that ifr any additional requirement, will seak the assistance of Distnct Crises Management group, State Fire brigade, NDRF, NDMA and neighbouring industries.

3.7 (2)			No Regular Fire Drills or Emergency Evacuation Drills: There are no regular fire drills or emergency evacuation drills conducted to prepare personnel for a potential fire involving ammonium nitrate.	Unpreparedness in Case of Fire: The absence of regular fire and evacuation drills means that personnel are unprepared to respond swiftly and appropriately in the event of a fire, increasing the risk of injury or fatalities.	Historical Incidents: Past incidents, such as the West Fertilizer Plant explosion, show the catastrophic results of inadequate fire safety measures when dealing with ammonium nitrate, highlighting the need for comprehensive fire safety protocols.	Conduct Regular Fire Drills and Training: Schedule regular fire and evacuation drills and provide comprehensive training for personnel on fire response procedures involving ammonium nitrate.	DC	Regular Fire drills are being conducted. Evacuation and Fire response procedures with respect to Ammonium Nitrate handling is being imparted to all the concerned workers/personnel.
3.7 (3)			Lack of Firefighting Equipment and Training: Firefighting equipment is either not available or insufficient, and there is a lack of training for personnel in using the equipment effectively in ammonium nitrate-related fires.	Ineffective Firefighting Efforts: Inadequate equipment and training for firefighting mean that even minor fires involving ammonium nitrate could escalate into major incidents due to ineffective initial response efforts.	Risk Management: Implementing fire safety measures, including suppression systems and training, is a fundamental risk management strategy to protect lives and property from the hazards posed by ammonium nitrate.	Equip and Train Firefighting Teams: Ensure that firefighting teams are properly equipped with appropriate gear and trained to handle fires involving ammonium nitrate safely and effectively.	DC	VPA having dedicated Fire brigade with all trained Fire fighting crew and equipped with appropriate gear and trained to handle effectively any Fires associated with Ammonium Nitrate handling.
3.8 (1)	3.8	**Poor Chemical Compatibility and Storage Practices**	No Assessment of Chemical Compatibility: There is no assessment or monitoring of chemical compatibility in areas where ammonium nitrate is stored, increasing the risk of hazardous reactions.	Risk of Hazardous Reactions: Without assessing chemical compatibility, ammonium nitrate could be stored near incompatible materials, such as flammable substances or reducing agents, which could lead to dangerous chemical reactions, fires, or explosions.	Regulatory Guidelines and Safety Standards: Safety standards, such as those from OSHA and the NFPA, require specific storage conditions for hazardous materials like ammonium nitrate to prevent accidents and ensure safety.	Conduct Chemical Compatibility Assessments: Regularly assess chemical compatibility in all areas where ammonium nitrate is stored to prevent hazardous reactions.	DC	AN storage is not permitted in the VPA premisses. However during handling of AN the adjecent berths are being kept vaccent Or only compatable carno's are allowed for handling
3.8 (2)			Improper Storage Conditions: Ammonium nitrate is not stored under conditions that minimize its risk, such as controlling temperature, humidity, and separation from incompatible substances.	Degradation of Ammonium Nitrate: Improper storage conditions, such as high temperatures or humidity, can lead to the degradation of ammonium nitrate, making it more susceptible to detonation or other hazardous reactions.	Case Studies and Lessons Learned: The Oppau explosion in Germany (1921) and other similar incidents have shown the dangers of improper storage and the critical need for compatibility assessments and stringent storage practices.	Improve Storage Conditions: Store ammonium nitrate in a controlled environment, maintaining appropriate temperature, humidity, and separation from incompatible materials to minimize risks.	TM	Storage of Ammonium Nitrate is not permitted in theo premises of VPA. However during handling of Ammonium Nitrate the adjscent berths are either kept vacant or allowed for compitable cargo handling only
3.8 (3)			Lack of Regular Inspections and Audits of Storage Areas: There are no regular inspections or audits to ensure that storage conditions are maintained and that ammonium nitrate is stored safely according to regulatory standards.	Undetected Safety Hazards: The absence of regular inspections and audits means that potential safety hazards in storage areas, such as leaks or contamination, could go unnoticed, increasing the risk of incidents.	Preventive Safety Measures: Assessing chemical compatibility and ensuring proper storage conditions are essential preventive safety measures to avoid dangerous chemical reactions and protect workers and facilities.	Implement Regular Inspections and Audits: Conduct regular inspections and audits of storage areas to ensure compliance with safety standards and identify potential hazards before they result in incidents.	DC/CME/TM/CMO	There is no facilty for storage of Ammonium Nitrate in the premises of Port area.
3.9 (1)	3.9	**Inadequate Community Safety and Awareness Programs**	No Community Awareness Programs or Communication Systems: There are no programs or systems in place to inform the local community about the risks associated with ammonium nitrate and the actions to take in case of an emergency	Community Vulnerability: The lack of awareness and preparedness programs leaves the local community vulnerable to the risks associated with ammonium nitrate, potentially leading to panic, injuries, or fatalities in an emergency	Regulatory Requirements: Safety regulations often require facilities handling hazardous materials to implement community safety and awareness programs to inform and protect the surrounding population.	Develop Community Awareness Programs: Implement programs to educate the local community about the risks of ammonium nitrate and provide clear instructions on what to do in case of an emergency.	HRDC/DC/CME	Handling of Ammonium Nitrate is away from the local habitation. However regular awareness programme are being conducted to all the surrounding staff/workers/personnel to follow Do's/Dont's in case of any emergency with respective of Ammonium Nitrate handling

3.9 (2)			Lack of Accessible Emergency Contact Information: Emergency contact information is not readily accessible to the community, preventing effective communication and coordination during an incident.	Delayed Emergency Response: Without accessible emergency contact information and coordination with local services, the response to an incident may be delayed, worsening the impact and increasing the risk to lives and property.	Precedents and Case Studies: The Bhopal gas tragedy (1984) highlighted the devastating impact of inadequate community awareness and preparedness in industrial areas, emphasizing the need for effective communication and emergency response planning.	Ensure Accessibility of Emergency Contact Information: Make emergency contact information readily accessible to the community and ensure it is regularly updated and communicated.	DC	Emergency contact information has been made available and it is being updated regularly
3.9 (3)			No Coordination with Local Emergency Services: There is insufficient coordination with local emergency services, such as fire departments and hospitals, to ensure a quick and effective response in the event of an ammonium nitrate incident.	Inadequate Communication During Emergencies: The absence of communication systems and coordination mechanisms can lead to confusion and uncoordinated efforts during an emergency, potentially escalating the situation.	Best Practices: International best practices recommend robust community safety programs and coordination with local emergency services to ensure a well-prepared response to hazardous material incidents.	Enhance Coordination with Local Emergency Services: Establish strong coordination mechanisms with local emergency services, including regular joint training exercises and communication drills to ensure a coordinated response in case of an incident.	DC	Regular Mock drills are being conducted duly involving all the agencies such as NDRF, NDMA, CISF, State Fire Brigade and concern agencies
3.10 (1)	3.10.	**Lack of Periodic Review and Update of Safety Policies**	No Regular Review of Safety Policies: There are no regular reviews or updates of the safety policies related to ammonium nitrate handling, leading to outdated practices that may not align with current regulations or best practices.	Outdated Safety Measures: Without regular reviews, safety policies and procedures may become outdated and ineffective, failing to address new risks or changes in regulatory requirements.	Regulatory Compliance and Standards: Safety regulations require regular reviews and updates of safety policies to ensure alignment with the latest standards and best practices for hazardous material handling.	Establish a Regular Review Process for Safety Policies: Implement a formal process for regularly reviewing and updating safety policies related to ammonium nitrate handling to ensure they remain effective and compliant with current regulations.	DC/CME/TM/CMO	The Policy updating regularly as and when required The Safety & Health Policy has been declared in 2020 and signed by the Chairperson of Visakhapatnam Port Authority. VPA updated Environmental, Health and Safety Policy in the month of APR' 2024.
3.10 (2)			Inconsistent Application of Safety Regulations: The application of safety regulations is inconsistent, leading to potential gaps in safety measures and increased risk.	Increased Risk of Non-Compliance: Inconsistent application of safety regulations increases the risk of non-compliance, which can result in legal penalties, fines, and reputational damage.	Case Studies and Industry Best Practices: Incidents in the chemical industry have shown the importance of regularly reviewing and updating safety policies to prevent accidents and ensure compliance with evolving regulations.	Ensure Consistent Application of Safety Regulations: Develop clear procedures and guidelines to ensure the consistent application of safety regulations across all operations.	DC/CME	VPA taking necessary actions against safety precautions to control the accidents while handling of cargo. VPA conducting regular Inspections on Safety measures as suggested by Safety Audit, Safety Rules & Standard procedures.
3.10 (3)			No Performance Tracking of Safety Systems: There is no system in place to track the performance of safety measures and ensure continuous improvement in the handling of ammonium nitrate.	Lack of Continuous Improvement: The absence of performance tracking prevents the identification of weaknesses in safety systems and the implementation of improvements, reducing the overall safety of operations.	Continuous Improvement: Implementing a system for regular review and performance tracking is essential for continuous improvement in safety management, helping to prevent incidents and protect workers and the community.	Implement Performance Tracking Systems: Introduce systems to track the performance of safety measures, identify areas for improvement, and ensure continuous enhancement of safety practices.	DC/CME	From 05.01.2024 onwards VPA stopped the AN handling in the VPA as per APPCB Directions. Further, VPA Strictly following the safety norms while handling of Ammonium Nitrate, continuous monitoring for safe handling. Before starting of handling & VPA intimate to District Administration & Police Service also.
3.11 (1)	3.11.	**Insufficient Personal Protective Equipment (PPE) for Handling Ammonium Nitrate**	Lack of Proper PPE: There is a lack of appropriate personal protective equipment (PPE) for workers handling ammonium nitrate, increasing the risk of exposure to harmful chemicals.	Increased Risk of Chemical Exposure: Without proper PPE, workers are at a heightened risk of exposure to ammonium nitrate, which can cause respiratory problems, skin irritation, and other health issues.	Occupational Safety Standards: Regulations such as those from OSHA mandate the use of proper PPE for handling hazardous chemicals to minimize exposure risks and ensure worker safety.	Ensure Availability of Proper PPE: Provide appropriate PPE for all workers handling ammonium nitrate, including gloves, masks, eye protection, and protective clothing.	CME/TM	VPA distributes & ensures the usage of PPE like Helmet, Safety Shoes, Nose Masks, Googles, Hand Gloves etc. for workmen and PPE Register is also maintained. Further, VPA provided Eye Wash and Body Wash Stations arranged at required locations.
3.11 (2)			No Regular Inspection and Maintenance of PPE: PPE is not regularly inspected, maintained, or replaced, leading to the use of damaged or ineffective equipment.	Reduced Protection Due to Damaged PPE: Using damaged or worn-out PPE reduces its ability to protect workers, potentially leading to injuries or illnesses.	Historical Precedents: Previous incidents in the chemical industry have demonstrated the critical role of PPE in protecting workers from exposure and preventing injuries.	Implement Regular PPE Inspection and Maintenance: Establish a routine inspection and maintenance schedule for PPE to ensure it remains effective and safe to use.	CME/TM	VPA keeps continuous follow up plan for usage of PPEs and replacing damaged PPEs with New One.
3.11 (3)			Inadequate Training on PPE Usage: Workers are not adequately trained on the correct usage, storage, and maintenance of PPE, compromising its effectiveness in protecting against exposure.	Improper Use of PPE: Inadequate training on PPE usage can result in improper fitting, usage, or maintenance, further compromising worker safety and increasing the likelihood of accidents.	Risk Mitigation: Proper PPE, combined with regular maintenance and training, is essential to protect workers from the hazards associated with handling ammonium nitrate.	Conduct Comprehensive Training on PPE Usage: Offer regular training sessions on the correct usage, fitting, storage, and maintenance of PPE to all workers handling hazardous materials.	CME	VPA conducting Training programmes on PPE, Fire & Fire Control, Emergency Evacuation and General Awareness of Safety for all types of employees.

3.12 (1)	3.12	**Inadequate Security Measures for Ammonium Nitrate Storage Areas**	Lack of Physical Security Barriers: There are no physical security barriers around ammonium nitrate storage areas to prevent unauthorized access.	Risk of Unauthorized Access: Without physical security measures and access control, unauthorized personnel may gain access to ammonium nitrate storage areas, increasing the risk of theft, sabotage, or accidental exposure.	Security Regulations and Best Practices: Security standards for hazardous materials storage, such as those from the Chemical Facility Anti-Terrorism Standards (CFATS), require robust security measures to prevent unauthorized access and protect against theft or sabotage.	Install Physical Security Barriers: Erect fences, walls, or other physical barriers around ammonium nitrate storage areas to prevent unauthorized access.	TM	Whenever Ammonium Nitrate vessel arrives at port, temporay barricades are installed during the period the vessels stays at berth. This is done apart from the ample precautionary measures taken to avoid possible mishap.
3.12 (2)			Insufficient Surveillance and Monitoring Systems: The storage areas are not adequately monitored with surveillance cameras or other monitoring systems, leading to potential security breaches.	Potential for Security Breaches: Insufficient surveillance and monitoring systems make it difficult to detect and respond to security breaches in a timely manner, potentially leading to significant safety and security incidents.	Case Studies and Incidents: Past incidents involving the theft or misuse of hazardous materials highlight the importance of strict security measures to prevent such occurrences.	Enhance Surveillance and Monitoring Systems: Deploy surveillance cameras and other monitoring systems to continuously monitor storage areas and detect any security breaches.	CME	There is no facility for storage of Ammonium Nitrate in the premises of Port area.
3.12 (3)			No Access Control Mechanisms: There are no access control mechanisms, such as locks or security personnel, to restrict entry to authorized personnel only.	Vulnerability to Terrorism or Sabotage: Ammonium nitrate is a dual-use material that can be used in the manufacture of explosives. Poor security measures increase the risk of the material being misused for malicious purposes.	Prevention of Malicious Acts: Implementing strong security measures, including surveillance, access control, and physical barriers, is crucial to preventing theft, sabotage, or misuse of ammonium nitrate.	Implement Access Control Mechanisms: Establish access control systems, such as locks, key cards, and security personnel, to restrict entry to authorized personnel only.	TM/CISF	Every entry into the Dock Area either by personnel or vehicle is restricted and done only through valid pass provided and approved by authorised signatory of Port J42
3.13 (1)	3.13	**Insufficient Training and Competency Assessment Programs**	Lack of Specialized Training Programs: There are no specialized training programs focused on handling ammonium nitrate and understanding its specific hazards and safety measures.	Inadequate Knowledge and Skills: Without specialized training, workers may lack the necessary knowledge and skills to handle ammonium nitrate safely, increasing the likelihood of accidents or improper handling.	Training Regulations and Best Practices: Occupational safety regulations require that employees handling hazardous materials receive specialized training and demonstrate competency to reduce the risk of accidents and exposure.	Develop Specialized Training Programs: Create and implement specialized training programs that cover all aspects of handling ammonium nitrate, including chemical properties, associated risks, and emergency procedures.	DC/CME	VPA conducting Training programmes for all types of employees. VPA proposed to conduct Trainings by External Trainers.
3.13 (2)			No Competency Assessment Mechanisms: There are no mechanisms in place to assess the competency of workers handling ammonium nitrate, leading to a lack of assurance that they are adequately prepared.	Higher Risk of Human Error: The absence of competency assessments means there is no formal process to verify that employees have understood training content, which increases the risk of human error during operations.	Importance of Ongoing Education: Continuous training and competency assessments are critical to ensuring that workers stay up-to-date with the latest safety procedures and regulatory changes.	Introduce Competency Assessment Frameworks: Establish competency assessment frameworks to evaluateworkers'understanding of training materials and their ability to apply safety measures in practice.	DC/CME	The skilled & experienced Dock Workers are ensured while engaging them for handling of Ammonium Nitrate. of VPA engaged Safety.
3.13 (3)			Absence of Refresher Courses and Continuous Training: There is no provision for regular refresher courses or continuous training to keep workers updated on the latest safety practices and regulations.	Non-Compliance with Safety Standards: Insufficient training programs and competency assessments can lead to non-compliance with national and international safety standards, exposing the organization to potential fines and sanctions.	Risk Management and Mitigation: Proper training and regular competency assessments are fundamental components of effective risk management strategies, helping to minimize the likelihood of accidents and enhance overall safety.	Provide Regular Refresher Courses: Offer regular refresher courses and continuous training sessions to keep workers informed of the latest safety practices and regulatory updates.	DC/CME	VPA conducting trainings at regular intervals to complete the circle of employees and to be repeated in a cycle.
3.14 (1)	3.14	**Lack of Emergency Medical Response and Preparedness**	No On-Site Medical Facilities for Emergency Situations: There are no dedicated on-site medical facilities equipped to handle emergencies related to ammonium nitrate exposure.	Delayed Medical Response: In the event of an exposure or accident, the lack of on-site medical facilities and inadequate coordination with local services could result in delayed medical response, exacerbating injuries or health outcomes.	Health and Safety Regulations: Occupational health and safety regulations mandate the availability of adequate medical facilities and first aid provisions for handling hazardous materials to ensure prompt and effective treatment of injuries.	Establish On-Site Medical Facilities: Develop dedicated on-site medical facilities equipped to handle emergencies specific to ammonium nitrate exposure, including decontamination stations and necessary medical supplies.	CMO	VPA have its own medical facilities i.e .one first aid centre with trained first aider near by the cargo handling operations and a fully equipped 24 hour functioning hospital with trained medical doctors ,nursing staff and first aider with a 24 hour functioning ambullance facility with in a radius of 1 km from the area of cargo handling operations.
3.14 (2)			Inadequate First Aid Training and Supplies: First aid supplies are insufficient, and there is a lack of regular first aid training for personnel, particularly for handling chemical exposure scenarios.	Insufficient Immediate Care: Without adequate first aid supplies and training, immediate care for exposed or injured personnel may be ineffective, increasing the severity of injuries and health risks.	Preparedness for Emergency Situations: Being prepared for medical emergencies is crucial for minimizing health risks associated with ammonium nitrate exposure, as rapid response can significantly reduce the severity of injuries.	Enhance First Aid Training and Supplies: Conduct regular first aid training sessions for all staff, focusing on chemical exposure scenarios, and ensure that first aid supplies are comprehensive and readily available.	CMO	First aid training sessions are conducted for the staff focussing on chemical exposure scenarios with emphasis on ammonium nitrate handling. All the necessary first aid materials are made available .

3.14 (3)			No Coordination with Local Medical Services: There is no formalized coordination plan with local hospitals and emergency medical services to respond effectively in the event of an incident involving ammonium nitrate.	Higher Risk of Fatalities or Severe Injuries: The absence of proper emergency medical response measures increases the likelihood of fatalities or severe injuries in the event of a major incident involving ammonium nitrate.	Best Practices from Industry Standards: Leading practices in hazardous material management emphasize the importance of robust medical response systems and regular first aid training to ensure worker safety.	Formalize Coordination with Local Medical Services: Create formal agreements and response plans with local hospitals and emergency medical services to ensure coordinated and rapid response in the event of an incident.	CMO	VPA has MOUs with all the local large multi speciality hospitals with empanelment for accepting and providing both elective and emergency care to all the patients of VPA at any time and incase of any incidents resulting in mass casualties ,the empanelled hospitals will be communicated for coordinating with the medical department /VPA.
3.15 (1)	3.15.	**Inadequate Community Safety and Communication Programs**	No Community Education Programs: There are no programs in place to educate the local community about the risks associated with ammonium nitrate and the appropriate response actions in the event of an emergency.	Unpreparedness in the Community: Without education and communication programs, the local community may be unprepared to respond effectively in the event of an emergency involving ammonium nitrate, increasing the potential for harm.	Community Right-to-Know Laws: Many regulations, such as the Emergency Planning and Community Right-to-Know Act (EPCRA), mandate the communication of hazardous material risks to the community and the provision of emergency response information.	Develop Community Education Programs: Launch educational programs to inform the local community about the risks associated with ammonium nitrate and provide guidance on emergency response actions.	DC	AN handling is isolated and far away from local habitation However periodical safety training / awareness training on the risks associated with AN is being given to the workers / stevedores / agents who working surroinding berths
3.15 (2)			Lack of Accessible Emergency Contact Information: Emergency contact information is not readily accessible to the community, leading to confusion and delayed response in emergencies.	Delayed Emergency Response: Lack of accessible emergency contact information can delay the community's ability to report incidents or seek assistance, potentially exacerbating the impact of an emergency.	Role of Public Awareness in Emergency Preparedness: Educating the public about risks and emergency procedures is crucial for enhancing community resilience and ensuring a coordinated response in the event of an incident.	Ensure Accessibility of Emergency Contact Information: Make emergency contact information readily accessible to the community through various channels, such as public notices, websites, and community centers.	DC	Emergency contact information is ready available througho websites and community centres
3.15 (3)			No Regular Communication with Community Stakeholders: There is no regular communication with community stakeholders to inform them about safety measures, updates, or potential risks related to ammonium nitrate handling.	Erosion of Trust and Public Confidence: Inadequate communication and transparency can erode public trust and confidence in the organization's ability to manage risks, potentially leading to reputational damage and community opposition.	Precedents from Other Incidents: Past incidents have shown that effective community engagement and communication can significantly reduce the impact of chemical emergencies and improve overall safety outcomes.	Establish Regular Communication with Stakeholders: Create a framework for regular communication with community stakeholders to keep them informed about safety measures, updates, and potential risks.	TM	Periodic Mock Drill are conducted by VPA oficaisl to give awareness to the workers and vehicle drivers. Awareness claases are also conducted at the work stop for every shift by the Port Authorities to workers / drivers.
3.16 (1)	3.16.	**Lack of Fire Protection Systems and Emergency Preparedness for handling ammonium nitrate incident**	No Dedicated Fire Suppression Systems: There are no dedicated fire suppression systems, such as sprinkler systems or fire extinguishers, specifically designed to handle fires involving ammonium nitrate.	Increased Risk of Fire Spread: Without dedicated fire suppression systems, fires involving ammonium nitrate can spread rapidly, leading to extensive damage, injuries, and potential fatalities.	Fire Safety Regulations and Codes: Fire safety regulations, such as those from the National Fire Protection Association (NFPA), require the installation of fire suppression systems and regular fire drills to ensure preparedness for fire-related emergencies.	Install Dedicated Fire Suppression Systems: Equip all areas where ammonium nitrate is stored or handled with appropriate fire suppression systems, such as sprinklers and fire extinguishers, specifically designed for chemical fires.	DC/CME	VPA provided fire protection system at cargo stack yards and berths. At the time of berthing of vessels containing AN, additional fire safety is ensured by placing the fire tender & fire monitors. Whereas newly constructed covered storage sheds for storage of dusty cargo VPA proposed to install fire hydrant line at Ammonium Nitrate handling berth.
3.16 (2)			Inadequate Fire Drills and Emergency Exercises: Fire drills and emergency exercises are not conducted regularly, leading to a lack of preparedness among personnel for fire-related emergencies.	Unprepared Workforce: Inadequate fire drills and emergency exercises mean that personnel are not well-prepared to respond effectively to fires, increasing the likelihood of panic, confusion, and delayed response.	Lessons from Previous Fire Incidents: Incidents involving fires in chemical storage areas have demonstrated the importance of having dedicated fire suppression systems and well-trained personnel to prevent escalation and protect lives.	Conduct Regular Fire Drills and Emergency Exercises: Implement a schedule for regular fire drills and emergency exercises to ensure all personnel are familiar with fire response procedures and can act swiftly and effectively in an emergency.	DC	Regular Mock drills are being conducted duly involving all the agencies such as NDRF, NDMA, CISF, State Fire Brigade and concern agencies. To ensure all personnel are familier with Fire response procedures and can act swiftly and effectively in case of any emergency

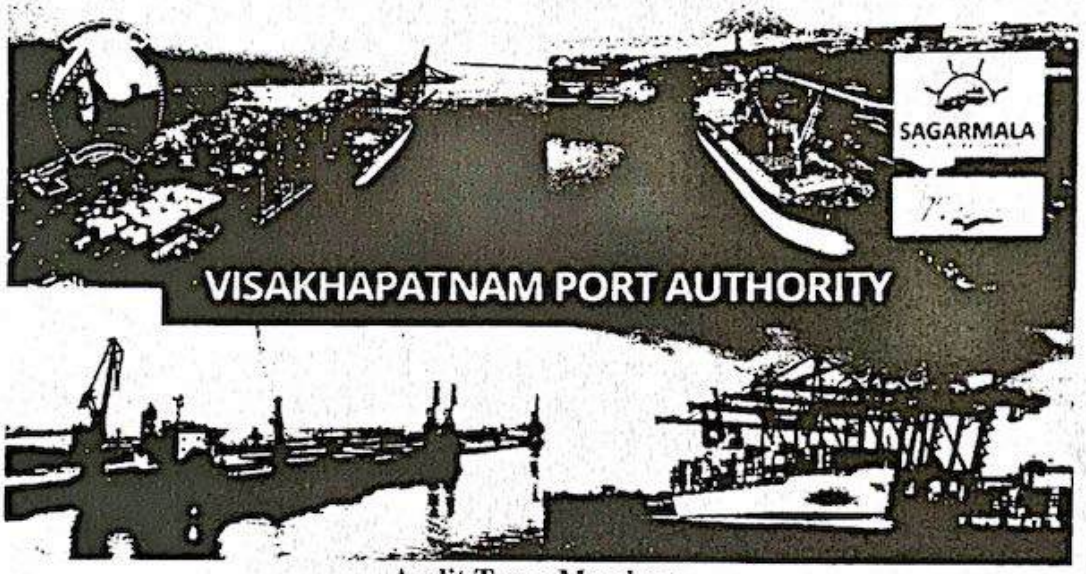
3.16 (3)			Absence of Fire Safety Plans and Documentation: There are no comprehensive fire safety plans or documentation detailing the procedures to be followed in the event of a fire involving ammonium nitrate.	Non-Compliance with Fire Safety Regulations: The lack of fire safety plans and documentation may result in non-compliance with fire safety regulations, leading to potential fines, legal action, and increased liability.	Importance of Fire Safety Planning: Comprehensive fire safety plans and regular drills are critical for ensuring a coordinated and effective response to fires, minimizing damage, and protecting personnel and assets.	Develop Comprehensive Fire Safety Plans: Create detailed fire safety plans that outline the procedures to be followed in the event of a fire involving ammonium nitrate and ensure that these plans are regularly reviewed and updated.	DC	Fire safety plans are available and procedures to be followed in the event of Fire involving Ammonium Nitrate and are being regularly reviewed and updated.
3.17 (1)	3.17.	**Absence of On-Site Emergency Plan and Inadequate Disaster Management for Handling Ammonium Nitrate**	Absence of On-Site Emergency Plan: The required on-site emergency plan, as stipulated by the Manufacturing, Storage, and Import of Hazardous Chemicals (MSIHC) Rules, was not found. Despite this, officials claimed that both on-site and off-site plans were covered under the disaster management plan.	Increased Risk of Unmanaged Emergencies: The absence of a detailed on-site emergency plan increases the risk of unmanaged emergencies, potentially leading to severe consequences in the event of a fire or explosion involving ammonium nitrate	MSIHC Rules Requirements: According to MSIHC Rules, facilities handling hazardous chemicals must have a detailed on-site emergency plan to address specific risks and ensure preparedness for emergencies.	Develop and Implement an On-Site Emergency Plan: Immediately develop and implement a comprehensive on-site emergency plan that meets MSIHC Rules requirements. This plan should include detailed procedures for responding to emergencies involving ammonium nitrate.	DC	VPA have comprehensive On-site and Off-site emergency plan and the same was updated in the month of May 2024
3.17 (2)			Inadequate Disaster Management Documentation: The emphasis on disaster management plans without proper documentation of the on-site emergency plan for handling tonnes of ammonium nitrate indicates a significant oversight. The lack of an on-site plan suggests that hazard identification and risk assessment for this quantity of ammonium nitrate were not conducted	Inadequate Hazard Identification: The lack of a comprehensive hazard identification and risk assessment demonstrates a failure to address the specific risks associated with large quantities of ammonium nitrate, leaving the facility vulnerable to unanticipated hazards.	Importance of Comprehensive Risk Assessment: Proper hazard identification and risk assessment are crucial for understanding and mitigating the risks associated with large quantities of hazardous chemicals like ammonium nitrate. Previous incidents have shown that inadequate planning can lead to catastrophic outcomes.	Conduct a Thorough Hazard Identification and Risk Assessment: Perform a detailed hazard identification and risk assessment to address the specific risks associated with handling 30,000 kg of ammonium nitrate. Ensure that the assessment covers all potential hazards and provides measures to mitigate them.	DC	Hazard identification and Risk Assesment staudy for Ammonium Nitrate handling has been carried out and copy of the same is enclosed
3.17 (3)			Insufficient Hazard Assessment: One Quality Risk Assessment (QRA) report was found, but it addressed hazards at a minimal level and failed to quantify the full spectrum of hazards associated with the substantial quantity of ammonium nitrate stored.	Potential Compliance Issues: Failure to develop and implement an on-site emergency plan may result in non-compliance with MSIHC Rules, exposing the facility to legal repercussions and increased liability.	Critical Need for Effective Emergency Planning: Effective emergency planning, including both on-site and off-site plans, is essential for managing the risks associated with hazardous chemicals and ensuring a coordinated response to emergencies.	Review and Update Disaster Management Documentation: Ensure that disaster management documentation is accurate and up-to-date, clearly outlining both on-site and off-site emergency plans. Regularly review and update these plans to reflect current best practices and regulatory requirements.	DC	VPA have DMP and same was updated in the month of May 2024 and it was vetted by the District collectorate and Magistrate
3.18 (1)	3.18.	**Lack of Follow-Up on Directives by Earlier Committees**	There is a notable absence of follow-up on directives issued by earlier committees concerning the handling and transportation of ammonium nitrate. Previous recommendations and safety measures have not been adequately tracked or enforced. This lack of follow-through has led to continued vulnerabilities and non-compliance with established safety protocols.	The failure to follow up on previous directives perpetuates existing risks and gaps in safety measures. This oversight prevents the implementation of necessary improvements, leaving the facility and surrounding areas exposed to potential accidents and hazards associated with ammonium nitrate. Additionally, the lack of enforcement of past recommendations can undermine regulatory compliance and affect the facility's overall safety performance.	Effective safety management requires the diligent follow-up of directives and recommendations to ensure continuous improvement and compliance with safety standards. Previous incidents and audits have highlighted the need for systematic tracking and implementation of safety measures. Neglecting these directives can lead to repeated safety failures and increased risk, as seen in various historical incidents where non-compliance with safety recommendations contributed to catastrophic events.	Establish a Follow-Up Mechanism: Implement a systematic process for tracking and enforcing directives from previous committees. This should include regular reviews and updates on the status of safety recommendations.	DC/CME/TM/CMO	VPA has not stored Ammonium Nitrate in Port area. VPA ensures the valid licence for handling of Ammonium Nitrate i.e Un-loading and Transporting
3.18 (2)						Assign Responsibility: Designate a team or individual responsible for ensuring that all directives are addressed and implemented effectively.	DC/CME/TM/CMO	VPA issues prior information to District Administration and Police. Dedicated Fire Brigade is allocated to monitor and readily available at Ammonium Nitrate handling area.

3.18 (3)						Conduct Regular Audits: Perform periodic audits to assess compliance with previously issued directives and identify any outstanding issues that need to be resolved.	DC/CME	At present, handling of Ammonium Nitrate is ban in VPA. Once clearance is obtained and permission is granted, VPA will propose DGFASLI to conduct Safety Audit.

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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
[illegible] स्वास्थ्य भवन [illegible] एस.एस. मंकीकर मार्ग, शीव, मुंबई - 400 022, भारत
[illegible] Swasthya Bhavan, S.S. Mankikar 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

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Submission of compliance of DGFASLI report on Ammonium Nitrate handling in VPA

1. SOP for Ammonium Nitrate
2. Emergency Action plan for Ammonium Nitrate
3. On-site Emergency plan
4. Off-site Emergency plan
5. Disaster Management plan
6. Check list
7. Mock drill reports
8. Training record
9. Risk Assessment study for Ammonium Nitrate

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विशाखपट्टणन पोर्ट प्राधिकरण
Fire & Asst. Safety Officer
VISAKHAPATNAM PORT AUTHORITY

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SOP FOR AMMONIUM NITRATE

1. Fire Tender along with Crew is being kept stand by at the Ammonium Nitrate handling Area. In case of any emergency another 04 Fire Tenders available with VPA will be Deployed immediately.
2. In case of offsite emergency; we take the help of mutual aid scheme partners, District Crises Management group i.e State Police, State Fire Brigade, State Medical Department, SDME, NDRF, NDMA, COASTGUARD & INDIAN NAVY.
3. VPA have dedicated firefighting vessel i.e. Fire Float & another 03 Tugs with external Firefighting Facilities which can be deployed during any emergency to fight from sea side.
4. VPA have two groups for tackling any disaster in our port one is Crises Management Group (CMG) & second is Incident Response Team (IRT).

   Crises management group-(CMG) is the apex group which consist of Chairman, Deputy Chairman, All HOD's and CISF Commandant which takes the decision, management of media and Co-Ordinate with all Agencies.

   Incident Response Team (IRT) consist of Harbour Master, Fire Officer & Departments Deputy HOD's/ Superintendent Engineer (SE) who rushed to the spot to tackle the situation and Inform to Crises Management Group-(CMG) for required help.
5. Adequate Fire Extinguishers are being placed at the Ammonium Nitrate handling area.
6. Bunkering of Oil is not permitted.
7. Hot Work within 30mts area is not permitted.
8. Entry of unauthorised persons is not permitted.
9. Display MSDS of Ammonium Nitrate.
10. Periodic Mock Drill are being conducted duly inviting all the concerned Government And Handling Agencies.
11. Ammonium Nitrate handling precautions awareness classes are being conducted During discharge of Ammonium Nitrate in each shift for all the Employees at the spot.
12. The recommendations issued in the QRA are being followed during Discharge of Ammonium Nitrate.
13. Ammonium Nitrate stuffed containers at the jetty to be shifted immediately
14. The Ammonium Nitrate discharging berth area will be cordoned with barricades.
15. Continuous monitoring 24X7 through CC Cameras.
16. Ammonium Nitrate storage is not permitted at the berth area/in the VPA premises. Only direct delivery from the hook point is permitted.
17. Ensure the trailers/vehicles should maintain specified speed limit
18. Regular inspection by fire officer & safety officer will be carried out during discharge of ammonium nitrate to ensure safe handling.

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EMERGENCY ACTION PLAN

Action by first respondent:

1. Berth AQF informs to the stand by Fire Crew on the berth.

Action by standby Fire Crew at Berth:

1. The stand by Fire Crew along with Water Tender rush to the spot and starts cooling.
2. The stand by crew rescue the causalities and give the First Aid and shift the causality to the fresh air area
3. Shifts the causality to Hospital by Ambulance
4. Informs to Fire Control.

Action by Fire Control:

1. Informs to Fire Officer
2. Informs to Shipping Assistant, Port Control, Traffic Control & CISF Control
3. Informs to Action Group Members i.e. EXE (C), EE (M), EE (Ele) Dy. CMO & Dy. Commandant
4. Alert the Fire Crew at Central Fire Station and keep standby for second turnout
5. As per instructions of Fire Officer, send the second Water Tender along with Crew to the spot.
6. Receives message and informs accordingly

Action by Fire Officer:

1. Rush to the spot
2. Gives instructions to Fire Fighters
3. Carry out the rescue operations and shifting of causalities
4. Ascertain the situation along with SIC (HM)
5. Orders for second turnout
6. Seeks Mutual Aid Members help & A. P. Fire Brigade.

Action by Shipping Assistant:

1. Informs DC & HM

Action By Marine Foreman:

1. Arrange Tugs, launches, ferry the staff and equipment to the spot.

Action by C. I. S. F:

1. Rush to the spot and Cordon the area
2. Divert the vehicle Traffic and ensure the smooth movement of emergency vehicles

Action by Harbour Master (S. I. C):

1. Rush to the spot
2. Along with Fire Officer ascertain the situation
3. Inform to DC about the situation

(P.T.O)

Action by Emergency Incident Controller DC:

1. Receives informs from S.I.C.
2. Informs the situation Chairman/vpt and Dy. Chairman
3. Activates emergency Crisis Management Group

Action by CE department:

1. Arrange to ensure oil should not enter in to channel waters.
2. Deploy Proclainer for removal of debris.

Action by CME department:

1. Arrange cutting machine for rescue operations.
2. Arrange vehicles for shifting of Men & Material

Action by Traffic department:

1. Arrange for clearing/removal of the cargo at the jetty.
2. Laison with handling agents for emergency operations.

Action by Medical department:

1. To ensure send ambulance to be spot along with medical officer.
2. To shift the casualties by ambulance to the hospital.

Action by GAD department:

1. Arrange press meet briefing to Media & Newspapers.

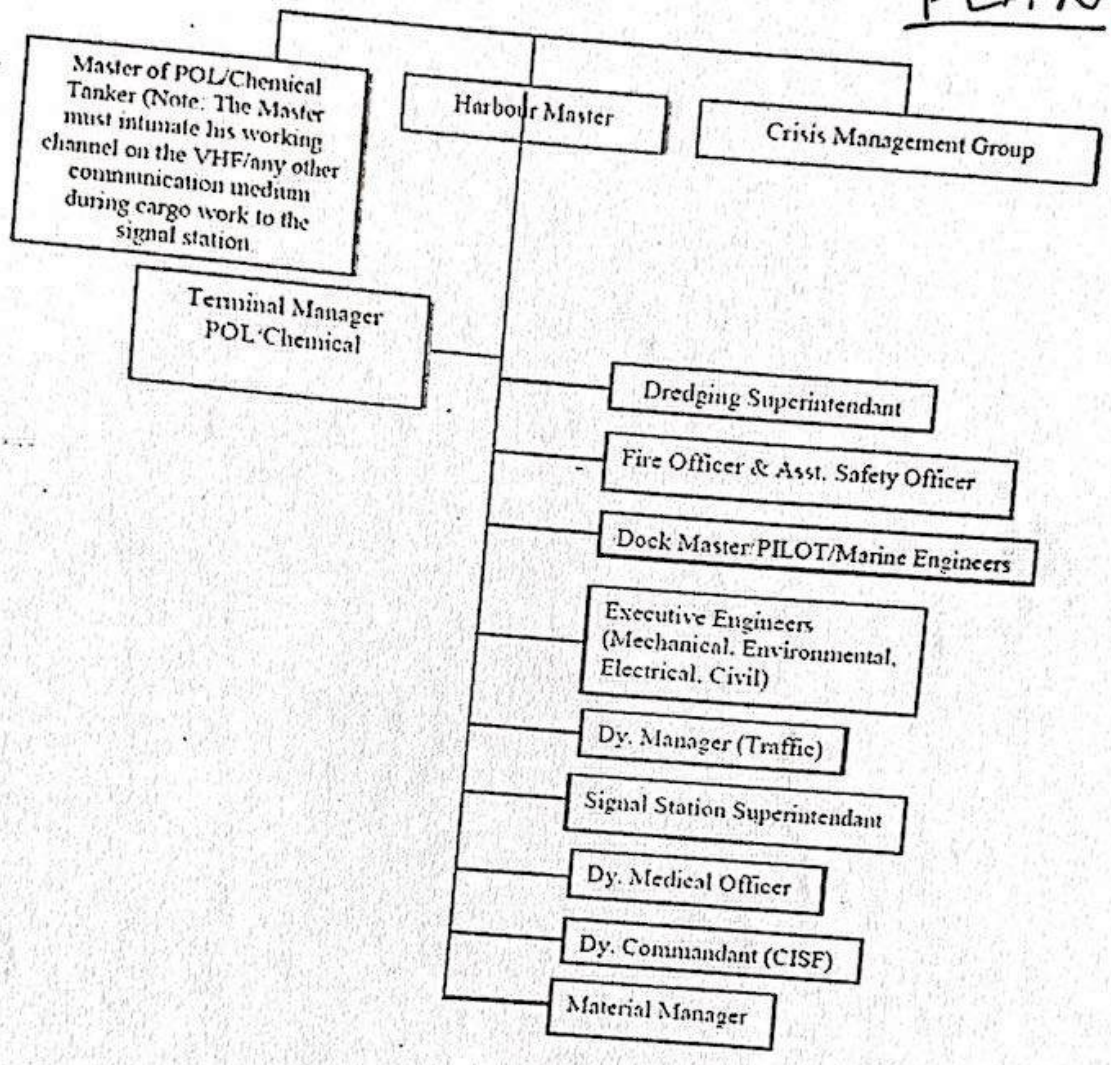
All Clear:

1. HM (SIC) & Fire Officer ascertain the situation and inform to DC.
2. After taking clearance announces all clear
3. Long siren for one minute will be sounded for all clear.

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ON-SITE EMERGENCY PLAN 330

Figure S3.1: Action group

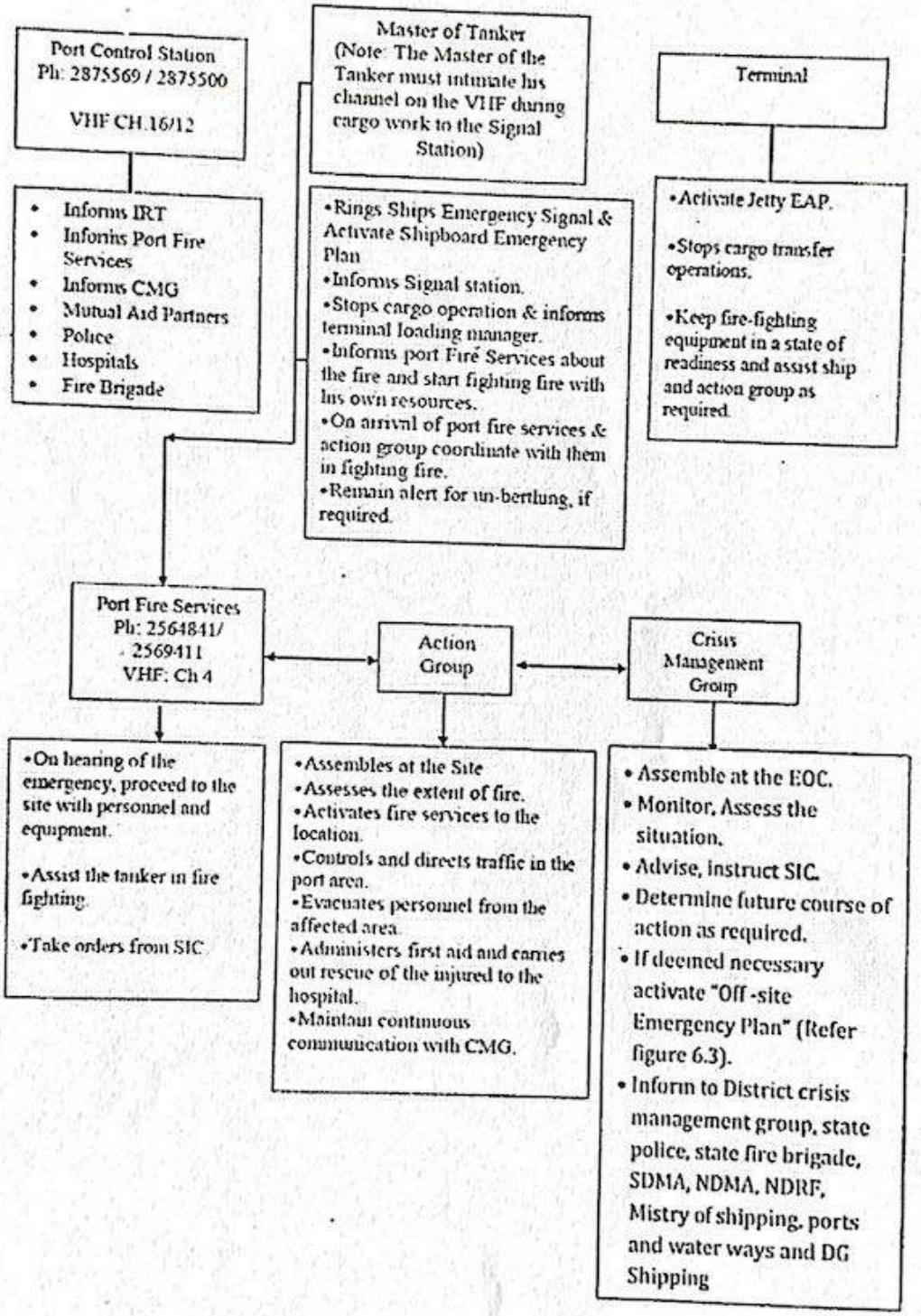


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OFF-SITE EMERGENCY PLAN

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Figure S3.2: Action Flow Chart



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DMP

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S3: Scenario 3 - Fire/Explosion due to Leakage of POL/Chemical at OR I, II & III – on Ship or Ashore (Benzene, Ammonium Nitrate, Acrylo nitryl, NDC, Hexane, ATF, Toluene, Methyl Dichloride, Styrene Monomer and CNG).

Action Plan

Resources required: Refer Figure S3.1.

Precautions: MSDS, SOP and Housekeeping.

1. The Master of the ship

   a) Should raise ships emergency alarm and activate ship board emergency plan.
   b) Stop transfer operation (as per SOP).
   c) Terminal should be informed of any incident on the ship without delay.
   d) Personnel to remain stand by all through the period of unloading operation to disconnect metal arms.
   e) To remain prepared to un-berth the ship to the safe area.
   f) The siren should be continued till the ship is taken to a safe location as per the CIC instructions.

2. The terminal personnel should:

   a) First activate Jetty EAP by informing the port VTS.
   b) Shut off isolation valve on pipeline at the berth (action as per SOP).
   c) Area should be cordoned off.
   d) In the event of a fire, the tower monitors should be used for firefighting.
   e) Surrounding equipment / installation to be kept cool by water jet from monitors.

3. Handling of POL/Chemical Emergencies.

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VISAKHAPATNAM PORT AUTHORITY

Table S3.1: Duties and Responsibilities of Action Group

Designated Officer	Role	Duties	Alternate Officer
Deputy Conservator	Chief Incident Controller	Will be stationed at the EOC to review & assess possible developments to determine the most necessary course of action. Assess the level of disaster and decide whether to activate EAP. He will give necessary instructions to SIC & arrange for external aid as necessary. To coordinate with the senior operating staff of the fire, police and statutory authorities. Establish the Relief operation after termination; provide debriefing before allowing normal operation.	Harbour Master
Harbour Master	Site Incident Controller	During Emergency shall proceed to the scene & communicate & collect all information from the Master of the Tanker and Terminal Manager. Conduct initial Briefing. He will report the situation to the CIC/CMG and assist CIC in assessing the incident. Initiate EAP. Alert vessels within the vicinity. He will extend all necessary help to the Master of the Vessel to fight the fire. He will instruct the F&ASO to keep the fixed firefighting installation in a state of readiness & activate if required. He will instruct Dredging Superintendent to keep tugs ready for fire-fighting or un-berthing of vessel. He will coordinate with all functional heads to take actions.	Dredging Superintendent
Dredging Superintendent	Pollution Response and ME Coordinator	Responsible for organizing tugs, mooring boats and pilots for combating the fire and rescue. Hire additional crafts as necessary. Assist SIC.	Dock Master/Pilot/ Marine Engineer
Dock Master/Pilot/ Marine Engineer	Port Control Room Coordinator.	Shall monitor the communication on VHF/any other communication medium & convey and relay messages on the advice from CIC/SIC. He will maintain Log of events.	Signal Station Superintendent

Designated Officer	Role	Duties	Alternate Officer
Master of the Tanker	In Charge of response operation on board vessel	Alert vessels within the vicinity. Shall be responsible for fighting the fire with ships own resources as well as with the available support from action group. He will coordinate with action group leader and will be responsible for shutting down all cargo operation on board in coordination with Terminal Manager. Shall unberth the vessel as per the instruction of CIC/SIC.	Chief Officer of Tanker
Tank Terminal Manager	Cargo Work	Shall be responsible of shutting down of cargo operation & coordinating with VPA and rendering necessary assistance to the SIC by providing additional firefighting & emergency response equipment as required. He will direct operation staff. Coordinate with the ship in-charge/C &F agents/stevedores.	Assistant Terminal Manager
Fire & Asst. Safety Officer	Fire Coordinator	Shall take orders from the SIC. Inform APPCB and other environmental agencies and take necessary guidance. He will lead the firefighting team and mobilize fire tenders, personnel & fire-fighting equipment to the scene & extend all necessary support to the Master of the vessel/Terminal Manager for firefighting. Ensure responsible actions for containing the run off fire water and other water from the damaged units. Assist in evacuation of the personnel to the assembly point or as directed by SIC. Conduct clean-up work during and after the emergency as quick as possible. Inform SIC for arrangement of any additional equipment as required.	Assistant Officer
Sr. Commandant - CISF	Security and Evacuation	Shall take orders from the SIC. Shall cordon off the area. Controls & directs gate security and traffic in the area. Shall facilitate evacuation, transport, first aid and rescue of	Dy. Commandant-CISF

Designated Officer	Role	Duties	Alternate Officer
		personnel from the scene at the time of emergency. Control the entry of unauthorized persons and vehicles. Check for entry of emergency vehicles .Liaise with the State Police. Responsible the head count of the personnel.	
Traffic Manager	Traffic Coordinator	Shall take orders from SIC and assist Terminal Manager. Submits consolidated list of dangerous goods in port including tankers in port and tank farms in port area. Regulate the traffic in the area.	Dy. Manager (Traffic)
Chief Engineer (Mechanical)	Mechanical Coordinator	Ensure water supply to the hydrants. Arrange for specialized equipment if required as per the instruction of the SIC.	Executive Engineers
Chief Engineer (Civil)	Civil Coordinator	Shall mobilize and dispatch sufficient number of vehicles to the site of emergency. Shall be responsible to carry out urgent civil works as required. Liaise with SIC and Traffic Manager.	Executive Engineers
Chief Engineer (Electrical)	In charge of Electrical Installation	Shall be responsible for uninterrupted electrical supply to vital equipment and utility at the berth. Shall remain alert on duty for any electrical isolation of equipment during emergency. Liaise with SIC and assist Terminal Manager.	Executive Engineers
Chief Medical Officer	Medical Coordinator	Shall be responsible to organize and keep first aid team with ambulance & necessary medicines to attend to any injured person at the site of the accident. Shall coordinate with the local hospitals.	Dy. Medical Officer
Duty Pilot	In Charge of Pilotage	Shall be ready on site for taking the ship out of berth and be ready for providing any assistance on site.	Standby Pilot
Chief Material Manager	Material Coordinator	Liaise with SIC and arrange for the necessary response material /equipment.	Material Manager

Code: IMAR/FS

Revision :0

Date :18-03-20

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VISAKHAPATNAM PORT AUTHORITY

MARINE DEPARTMENT

FIRE SERVICE

CHECK LIST FOR AMMONIUM NITRATE

The Shift-in-charge check the following precautions before Berthing of Ammonium Nitrate Vessel.

1.	Fire Watch Standby at the Unloading point	YES / NO
2.	The Berth area barricaded to avoid other vehicular traffic	YES / NO
3.	No "HOT JOB" is carried out within 30Mtrs radius	YES / NO
4.	No Oils/Grease/Combustible materials or incompatible materials present in contact to the Ammonium Nitrate	YES / NO
5.	The Berth properly cleaned before handling of the Cargo	YES / NO
6.	All concerned Staff to wear PPE	YES / NO
7.	Compliance to "No Smoking" regulations	YES / NO
8.	MSDS to be displayed for Ammonium Nitrate on the Berth	YES / NO

If any laps is found, immediately the same to be brought to the notice of Fire Officer for necessary action. Check lists are available in the register IMAR/FSS/RCL

- Name of the Tanker :
- Name of the Berth :
- Berthing Date & Time :
- Checking Date & Time :

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Fire & Asst. Safety Officer
VISAKHAPATNAM PORT AUTHORITY

SHIFT-IN-CHARGE

Loading / Unloading Master

FIRE OFFICER (VPA)

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Statement of Ammonium Nitrate Mock Drills Details of Fire Service Section

Sl No	Date& Location	Scenario	Deficiencies	Compliances
1	28-04-2021 EQ-6 Berth	Oil Tanker collided with Ammonium Nitrate Bags carrying Trailer and caught Fire	1. Ammonium Nitrate bags stuffed containers filed up at the jetty which are to be cleared in the Fast track mode. (Action: TM) 2. Ammonium Nitrate cargo spillage observed at the jetty. (Action: TM) 3. Fire Float stbd. Propeller engine starting but power not coming to wheel house for operation of the craft. (Action CME)	Complied Complied Complied
2	24-06-2022 WQ-8	Fire occurred in the Engine of Truck Trailer carrying Ammonium Nitrate bags stuff container due to Cables short circuit and spread to back side container.	1. Electrical Cables in the Engine of Truck Trailer should be properly routed by the respective operators. (Action: TM) 2. Truck trailer Drivers should be given awareness On precautions to be followed in case of Fire incidents. (Action: TM) 3. Ammonium Nitrate stuffed containers should be shifted immediately from the berth. (Action: TM)	Complied Complied Complied
3	20-04-2023 EQ-3	Oil tanker collided with Ammonium Nitrate bags carrying trailer and caught fire at EQ-3 berth	1. Ammonium Nitrate cargo loaded into containers and on the Trailers to be evacuated Immediately. 2. The Vehicles plying in the dock area should follow the speed limit of 20 kmph.	Complied Complied
4	31-05-2024 EQ-3	Oil tanker collided with trailer lorry and caught fire at EQ-3 berth	1. Transport drivers advised to follow the speed limit in the dock area. 2. Vehicles caution sign boards to be provided at EQ3 area.	Complied Complied
4	30-07-2024 EQ-4	Oil Tanker collided with Ammonium Nitrate bags carrying trailer and caught fire at EQ-4 berth	1. Vehicle drivers are instructed to ensure no any oil dripping from vehicle engine. 2. Ammonium Nitrate spillage on the berth to be cleared. 3. Torn bags and ducking materials are to be removed from the berth.	Complied Complied Complied

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Fire & Asst. Safety Officer

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Statement of Mock Drills Details of Fire Service Section

Sl No	Date& Location	Scenario	Deficiencies	Compliances
1	31-01-2024 GJH	Window AC Electrical cables Fire in Doctor's Room due to short Circuit.	Electrical fittings & Junction boxes are to be checked to avoid any Electric Short Circuit.	Complied
2	29-02-2024 OSTT	Crude Oil Leaked out while pumping in to main line from slope tank and caught fire at the Cargo Unloading Point (CUP) of OSTT berth	1. M/s. HPCL has to maintain good housekeeping at the manifold area (Action: M/s. HPCL) 2. M/s. HPCL has to remove the oil in the slope tank periodically. (Action: M/s. HPCL) 3. M/s. HPCL has to check the slope pump and its connections periodically to avoid any untoward Incidents. (Action CME)	Complied Complied Complied
3	07-03-2024 M/s. APL	The simulated scenario involved a propylene leakage detected from the bottom remote operating valve (ROV) upstream flange of sphere-A, which contains 400MT of propylene . As efforts were made to control the flange leak, liquid propylene unexpectedly flowed into the dyke resulting in a sphere during the flange leak containment this spark ignited a jet fire ,externally heating sphere-A and causing a rapid increase in pressure and temperature inside the sphere .Consequently an offsite emergency was declared.	1) Some members of M/s APL staff didn't wear proper PPE. (Action: M/s. APL) 2) No proper co-ordination from M/s APL staff at the site of incident. . (Action: M/s APL)	Complied Complied
4	30-04-2024 WQ-1 RE	Sulphuric Acid leaked out from a flange joint of cargo hoses due to gasket gave way while discharging from vessel at WQ 1RE	1. Shower & eye wash water discharge is not adequate	Complied
5	16-05-2024 A.O.B.	LPG leaked out from tube and caught Fire in the AOB Canteen	1) LPG leak / Fire prevention precautions are to be displayed at the location. 2). Gas line and Regulator are to be periodically checked.	Complied Complied
6.	31-05-2024 EQ-3	Oil tanker collided with trailer lorry and caught fire at EQ-3 berth	1. Transport drivers advised to follow the speed limit in the dock area. 2. Vehicles caution sign boards to be provided at EQ3 area.	Complied Complied
7	29-06-2024 Oil Wharf OR-III	Naphtha leaked out from flange joint of flexible cargo hoses and caught fire.	1. The flexible cargo hoses to be periodically hydro pressure tested by authorized agency. 2. Emergency telephones to be displayed at HPCL office.	Complied Complied

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8.	30-07-2024 EQ-4	Oil Tanker collided with Ammonium Nitrate bags carrying trailer and caught fire at EQ-4 berth	4. Vehicle drivers are instructed to ensure no any oil dripping from vehicle engine. 5. Ammonium Nitrate spillage on the berth to be cleared. 6. Torn bags and ducking materials are to be removed from the berth.	Complied Complied Complied
9.	30-08-2024 R&D yard	Caustic soda leaked out from the Rail tanker outlet pipeline near controlling valve at R&D yard	1. M/s. IMC must check control valves on the each Rail tanker. 2. M/s. IMC to collect then leaked out product and dispose it as per the rules.	Complied Complied

Loss of Ammunition

at ~~EQ~~ 6 M.V. LADY AYANA 20/01/2

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1st Shift : P. Gopalrao
S/O

Fire Duty I/C.

SNo	NAME		Deg	Sig
1	S. Rao	101495	C/Cr	
2	K. KRISHNA RAO	101523	C/Cr	
3	K. Sreenivasa Rao	101457	CHO	
4	V. SRINIVASA RAO	101527	C.H.D	
5	O. SRINIVASA RAO	101524	C.H.D.	
6	B. Raja	101478	C HD	
7	K.S. Rao	101477	CHD	
8	Ch. Gowda Rao	101515	CHD	
9	B. Nooka Raju	100586	Mistry	
10	CH. APPA RAO	100590	CHD	
11	P. SANKARA RAO	28014	Sub Officer	
12	P. Sani Baby	59807	FM	
13	D. Pydi Raju		DCPO	

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VISAKHAPATNAM PORT AUTHORITY

Date: 22-01-2024 Ist Shift 341

Awareness class conducted on Amonia Nitrate at EQ-6, M.V. LADY AYANA on 22-01-2024 Ist Shift Sig: P. Sankara Rao

SNO	NAME		Dig.	Sig.
(1)	B. SATYANARAYANA	(CW)	CHD	B Satyan
2	Gr. Appala Reddy	"	CHD	Gr. A. Redd
3	K. RAMANA	"	CHD	K. Ramana
4)	U. APPARAO	"	CHD	U. Appa Rao
5)	B. Musala Naidu	"	CHD	B. Musala
6)	D. Venkat Ramana	"	CHD	D. V. Ra
7)	V. SRI RAM. MURTHY	"	CHD	V. Sri Ram
8)	CH. Maseru		C H D	Chs
9)	S. Thatha Rao		C H D	S. T. Rao
10)	B. SRIDHAR	(C.W)	CHD.	B Sridhar
(11)	P. Dora Rao.	(C.W)	C.H.D.	P. Dora Rao
12)	P. SANKARA RAO	—	S/o	P Sankara Rao
13)	K. Demudu	—	dp	K. Demudu
14	V.V.J. prasad	—	HM	V.V.J Prasad
15)	P. Soni Baby	—	HM	P. Soni Baby

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Fire & Asst. Safety Officer
VISAKHAPATNAM PORT AUTHORITY

Date: 22-01-2024. II shift.

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Awareness Class Conducted by Fire: Dept
Engg: Announcement visited M/V LPG Tanker
Dt 22/01/2024 Emp Sign

Sign.

1	P.V. Ramana	Sr Asst/M	P.V.
2	K. Govinda	Jo	K. Govinda
3	P.S.M.R.	OP	
4	Y.S. Chalapathi Rao		
5	S. KRISHNA		
6	Srinivasa Rao		
7	M. Murthy		
8	J.K. SATYANARAYANA		
9	R. VENKATASRALU		
10	S VENKATARAMANA		
11	A. RAMANAIDU		
12	M. APPARAO		
13	V. APPARAO		
14	S. DEMUDU BABU		

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Fire & Asst. Safety Officer

Date: 31-07-24

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ISPS Awareness refresh training Conducted

P.No. 218

Central fire station on 31-07-2024

Awareness class on handling of Ammonium Nitrate fire Safety precautions and hand & hazardous chemicals as per IMDG Code and training imparted to the fire staff

SL NO	Name of the Employees	Desg	Emp No	Signature
1,	G. Janaki Rao	SO	12841	
2,	G M V. Satyanarayana	CFM	28126	
3,	V. Appala Naidu	DCPO	12962	
4,	P. V. Ramana	DCPO	28146	
5,	I V O Prasad Babu	FM	59724	
6,	S. Ramesh	FM	59739	
7,	S. V. Ramana	PK	7933	
8,	T. Narayana	PK	7931	
9,	PVSRKS. Prasad	fm	59385	
10	R. Prem Kumar	SO	28108	
11,	P. Chitti Babu	SO	01899	
12,	P. Hari Babu	PK	7844	
13	P. V. G. Reddy	PK	7932	
14	I. U. Satti Babu	PK	7936	

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Fire & Asst. Safety Officer

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8.	K. Jagadesh	DCPO		K. Jag
19.	G. MOHANA DU	DCPO		
20.	OBBINA. RAJESH. SAI	FM		
21.	P. Rohit Reddy	FM		P. Rohit Reddy
22	K. MANIKANTA Swamy	FM		
23.	Sk. Shareef	FM		Sk. Shareef
24.	Sangu Sanyasi Rao	FM		Sanyasi Rao
25.	G. Srinivas Sai Kumar	FM		G. S. Sai Kumar
26.	S. Raj Kumar	FM		S. Raj Kumar
27	M. David	FM		M. David
28.	K. Ch Ravi Teja	SO		
29.	P. Rao	SO		P. Rao
30.	T. Satish	FM		
31.	Ch. Venkatesh	L/F		
32.	G. Tarineshwa	F.M		31/07/24
33	M. Teja	L.F		Teja
34	D. Durga Prasad	F.M		Durga
35.	CHIRIKI KALYAN KUMAR	DCPO		Ch. Kalyan Kumar
36	RAPAKA PRUDHVI RAJ	L/F		
37	P S M Rao			

VISAKHAPATNAM PORT TRUST
TRAFFIC DEPARTMENT
SAFETY, HEALTH,ENVIRONMENT & QUALITY INTEGRATED MANAGEMENT SYSTEM

Location : SOP **Title:** Work Instructions

CODE : ITRA/SOP/WI -24

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, Hypochlorite's, 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, sisal, 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.

VISAKHAPATNAM PORT TRUST
TRAFFIC DEPARTMENT
SAFETY, HEALTH,ENVIRONMENT & QUALITY INTEGRATED MANAGEMENT SYSTEM

Location : SOP **Title:** Work Instructions

CODE : ITRA/SOP/WI -24

AMMONIUM NITRATE

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 standby 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 equipment's.
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.

Correspondence IDS

347

VISAKHAPATNAM PORT AUTHORITY
TRAFFIC DEPARTMENT

NO.ITRA/GEN/FMISC
Date: 23.12.2022.

Assistant Director (Dock Safety)
Inspectorate Dock Safety
Visakhapatnam.

Sir,

Sub:-Remarks of VPA with regard to the field observations and recommendations made by Safety Audit team, DGFASLI – Reg.

Ref: - 1.Safety Audit Report furnished by Safety Audit team, DGFASLI. Dt.27.10.2022

In context to the aforesaid subject it is to inform that Safety Audit was carried out by the Safety Audit Team, DGFASLI with regard to the handling procedure being followed at VPA with regard to handling of Import Ammonium Nitrate on 06.10.2022 and 07.10.2022.

Consequent to the conducting of safety audit as mentioned above, the safety audit team DGFASLI furnished the safety audit report cited as reference (copy enclosed) to VPA duly intimating the field observations and recommendations with regard to handling of Import Ammonium Nitrate cargo at VPA.

The content of the field observations and recommendations rendered by Safety Audit team, DGFASLI was examined and analysed at this end and the remarks of the action being taken / to be taken by this office and other sister concern of VPA has been complied and the same is enclosed herewith for kind reference and perusal please.

The observations and recommendations issued by Safety Audit team , DGFASLI as mentioned above has been circulated among the shipping outdoor staff with the direction to comply with the recommendations made by DGFASLI and the remarks made by this office there in strictly.

This is for your kind information please.

23/12/22
TRAFFIC MANAGER

Copy to: PA to Chairman for kind information of Chairman.
Copy to: PA to Dy.Chairman for kind information of Dy.Chairman.
Copy to: PA to CME for information
Copy to: Safety Officer for information

Police verification

Krishna
Today at 15:48

GOVERNMENT OF ANDHRA PRADESH
POLICE DEPARTMENT

Office of the Commissioner of Police, Visakhapatnam City.

C.No.7743/FI/PVC/CSB-II/VSPC/2020 Dt. 24 November, 2020

POLICE VERIFICATION CERTIFICATE

Ref: Lr.No.Nil, dated 13.11.2020 of Authorised Signatory, M/s Sri Harshitha Transports, 31-4-87/8, Ammavari Street, Allipuram, Visakhapatnam.

This is to certify that there is nothing adverse against Mr. BODDAPU APPALA NAIDU S/o. PENTAYYA whose date of birth is 01.01.1982, resident of D.No. 6-206, Sriram, Anandapuram, Visakhapatnam, Andhra Pradesh, as per the records of concerned Police Station during the last 24 months, under which the place of residence is situated.

This Certificate is issued only for shifting/transportation of Ammonium Nitrate Substance from Visakhapatnam Port to other States.

Hence certified.

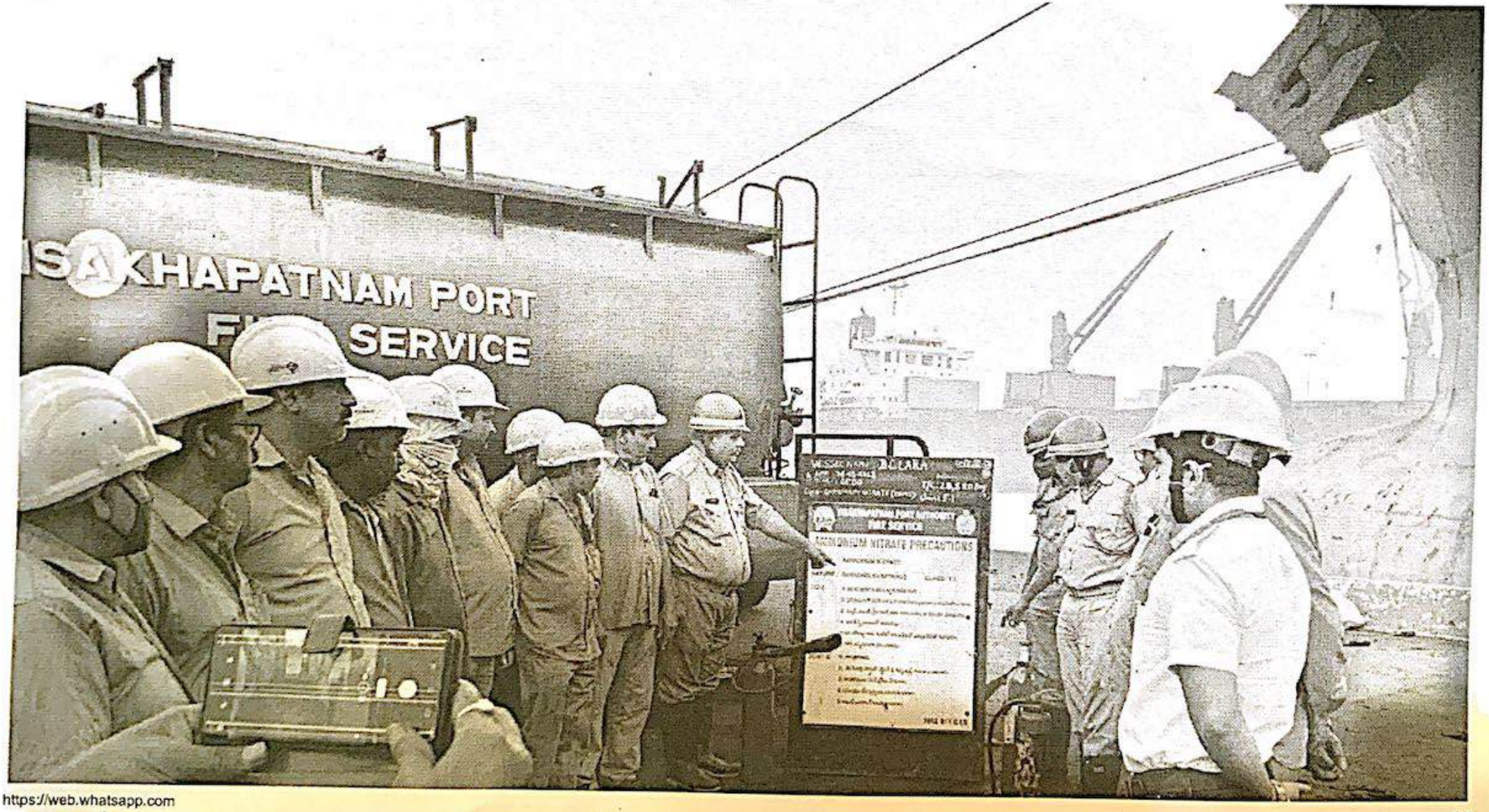
for Commissioner of Police
Visakhapatnam
Addl. Dy. Commissioner of Police
Cantonment Sub-Division
Visakhapatnam City

To
The Authorised Signatory
M/s Sri Harshitha Transports
31-4-87/8, Ammavari Street, Allipuram, Visakhapatnam.

Safety Measures.



Safety measures



Trg Programme to workers

VISAKHAPATNAM PORT AUTHORITY
GENERAL ADMINISTRATION DEPARTMENT
HUMAN RESOURCE DEVELOPMENT CENTRE

No. IGAD/HRDC/F.IES/147/2024/ 837
Dt. 27.06.2024

27 JUN 2024
Visakhapatnam Port Authority

To

1) Sri K. Diwakar,
Rtd. Sub-Officer,
Door No.19- 157,
Sai Madhavi Nagar,
Naiduthota,
Visakhapatnam - 530029,
Cell No. 9493417452.

2) Sri P. Gnani,
Safety Officer,
M&EE Department,

&

3) Dr.Y. Kanaka Raju,
Dy. CMO,
Medical Department.

Sub: Training Programme for the month of JULY, 2024 at HRDC, VPA – Reg.,

****

Training Programme on "Emergency Preparedness and Response" is scheduled to be conducted at HRD Centre, VPA on 23.07.2024. Therefore, you are requested to take up the following Topics as per the timings given below:

S.No.	DATE	NAME OF THE TOPICS	Faculty & TIME
01.	23.07.2024	j) Emergency situations ii) How to prepare for different emergencies. iii) How to respond.	Sri K. Diwakar, Rtd. Sub-Officer DC Department. **10.15 AM to 11. 15 AM**
02		iv) Emergency situations in work spots/dock area. v) Preventive measures, preparedness, response	Sri P. Gnani, Safety Officer, M&EE Department, **11.15 AM to 12.15 PM**
		// TEA BREAK//	12.15 PM to 12.30 PM
03		vi) First Aid in Emergency situations. vii) SOPs for reporting to Hospital.	Dr. Y. Kanaka Raju, Dy. CMO Medical Department **12.30 PM to 1.30 PM**

It is further requested to report at 10 minutes before your schedule to avoid lag in the schedule

Sr. Dy. SECRETARY

Copy to: CME – Sir, It is requested to spare the services of above concerned Officer on above said Date & Time please.
Copy to: CMO – Madam, It is requested to spare the services of above concerned Officer on above Date & Time please.

VISAKHAPATNAM PORT AUTHORITY
GENERAL ADMINISTRATION DEPARTMENT
HUMAN RESOURCE DEVELOPMENT CENTRE

No. IGAD/HRDC/F.SM/192/2008/ 1911
Dt. 27 .09.2024.

To

1) Sri P. Gnani,
Asst. Engineer & Safety Officer i/c.,
M&EE Department.

2) Sri K.Divakar,
Rtd. Sub-Officer (Fire),
D. No. 19-157,
Sai Madhava Nagar,
Naidu Thota,
Visakhapatnam – 530 029.

Sub: Training Programme on "Safety for Signal Men, Winch Men, Tindals & Mazdoors" at HRDC – Reg.,

****

The subject training programme is scheduled to be conducted at HRD Centre on 25.10.2024 from 10.15 AM to 1.30 PM (Half Day).

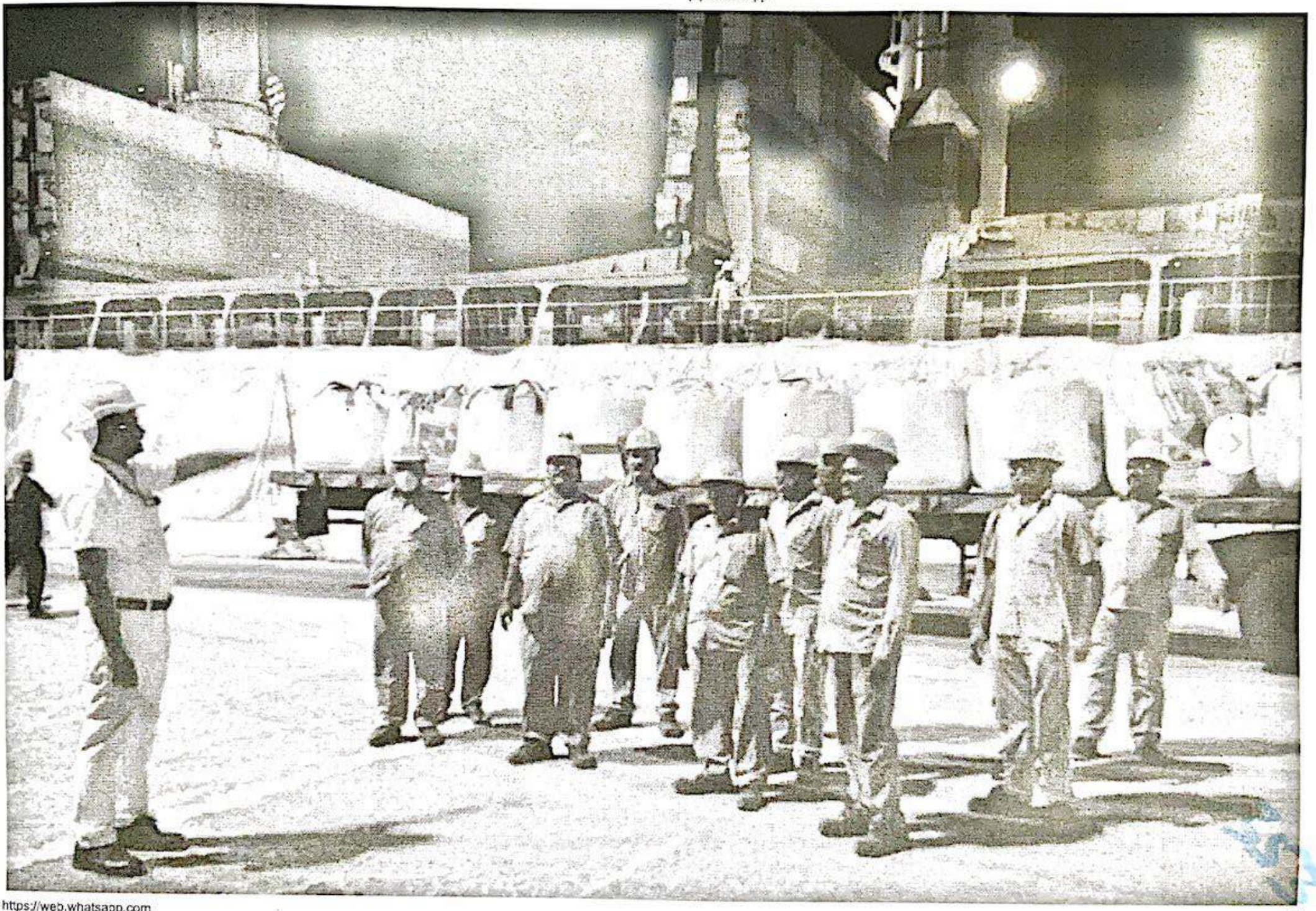
Date	Time	Hour	Topic	Faculty
25.10.2024	10.30 AM to 11.30 AM	1st	Fire Fighting	Sri K.Divakar, Rtd. Sub-Officer (Fire) VPA
	11.30 AM to 12. 00 AM		//Tea Break//	
	12. 00 AM to 01.30 PM	2nd	Safety in Cargo Handling Operations (on Board/On Shore). Usage of PPEs Accidents root causes & Analysis of Recent accidents	Sri P. Gnani Asst. Engineer, M&EE Department

You are, therefore, requested to take up class at HRD Centre, VPA on the above date and time mentioned please.

It is further requested to report at 10.15 AM Sharp, since the participants have been directed that late coming will not be allowed.

Sr. Personnel Officer

Copy to: CME – It is requested to spare the services of above Concerned Officer on above said Date & Time please.



VPT Inspection Report

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VISAKHAPATNAM PORT AUTHORITY
TRAFFIC DEPARTMENT

ITRA/SHP/FAMN
Dt:07.12.2023

08 Dec 2023

To
M/s Eswar Shipping Services.

M/s GKC Shipping and Logistics Pvt Ltd.

M/s Varun Associates.

Dear Sirs,

Sub: Inspection by Safety Office at Berth during handling the Ammonium Nitrate bags at EQ-6 berth m.v JOHAR ADAM - Reg.
Ref: Safety Officer / VPA Lr No:IMEE/MOF/SO/2734, Dt: 22/24-11-2023.

***

Vide the referred letter, Safety Office / VPA communicated the inspection observations in respect of the subject vessel m.v JOHAR ADAM which was berthed at EQ-6 on 16.11.2023, for discharge of Ammonium Nitrate.

Sl. No	Issue	Compliance Required
1	**Proper usage of PPEs**	Most of the private staff / Women Sweepers were not provided with the PPE's and therefore were not using the same. The same is to be thoroughly ensured.
2	**Safety shower and eyewash facilities**	Safety shower and eyewash facilities are to be provided at the wharf area where ammonium nitrate is being handled.
3	**PPE to Drivers / Helpers. Usage of Mobile Phones.**	All vehicles to be provided with reverse horns. All the Drivers & Helpers to be provided with PPP and should ensure that they are used. The Drivers of the Trucks were found using the Mobile Phones while on the Berth, which is to be avoided.
4	**House Keeping**	Unused, torn bags and other waste material was found to be strewn all over the Berth. Henceforth, it should be ensured that the same is removed immediately.
5	**Parking of the vehicles**	No vehicles, other than those meant for Cargo handling should be parked on the Berth or near to the Kerb wall.
6	**Private Workers found sleeping on the Wharf**	Suitable instructions to be issued to the Private Workers to avoid sleeping / Resting on the wharf area.

In view of the above, it is requested to comply with the above observations in toto, during handling of the Ammonium Nitrate vessels.

Yours faithfully,
7/12/2023
TRAFFIC MANAGER

CC: CME / Dy CME / EXE(M) / Safety Officer for information w.r.t the letter cited.
CC: DI(G) for information and further necessary for ensuring compliance of the above issues and to ensure that the QF / AQF's at the Berths give proper awareness regarding PPE and other Safety aspects to all concerned.

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VISAKHAPATNAM PORT AUTHORITY
MECHANICAL AND ELECTRICAL ENGINEERING DEPARTMENT
SAFETY WING

No: IMEE/MOF/SO/
Dt. 04.04.2023.

Traffic Manager

Safety Inspection carried out while handling the Ammonium Nitrate bags at WQ-7 berth on 04.04.2023 and the report is as follows.

Ref : Committee constituted Ltr.No ITRA/SHP/FAMN/7064 Dt 22.02.23

S.No	Description	Observations	Remarks.
01	Safety Awareness and Training	Safety Awareness given to the Fork Lift Operators by the Safety wing.	Berth AQF, shall ensure the training of the private and other employees.
02	Fire Fighting System	Fire Tender & Crew: kept stand by along with crew at cargo handling area.	Ok.
03	Vehicle movement / parking.	Found irregular parking.	Parking to be streamlined.
04	Necessary permission/clearance from Statutory authorities	Prior to arrival of ship carrying ammonium nitrate, necessary permission/clearance obtained from concerned statutory authorities.	Necessary permission/clearance certificates are kept @ berth AQF.
05	Barricading of ammonium nitrate handling area	The wharf handling ammonium nitrate area was barricaded.	Found ok.
06	Wharf Area handling ammonium nitrate	Tarpaulin covers were spread over the unloading point at the wharf area.	Tarpaulin covers were badly damaged.
07	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.	Display / sign boards to be arranged.
08	Separate supervisor and signaller on deck and as well as on wharf for every hook.	Found separate supervisor and signaller on deck and as well as on wharf for every hook.	Found ok.
09	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.	Found ok.

10	Spillage.	Found spillage of ammonium nitrate on wharf area.	Spillage to be arrested. If any Spillage found, shall be clear immediately.
11	Spill	Notice of the stevedore, it was collected (using iron shovel) by a casual worker with bare hand.	Advise the agent to avoid iron/ sharp edges tools for clearing the spill.
12	Use of sharp hooks/edges etc.	Iron shovel was used to clear the spilled Ammonium nitrate on wharf area.	In no case any sharp hooks/ edges shall be used to carry Ammonium nitrate jumbo bags.
13	Transportation of Ammonium nitrate jumbo bags	Some Drivers were not aware of dangers involved in ammonium nitrate.	
14	Proper usage of PPEs	PPEs were provide to the workers engaged and also the dock workers.	Most of the private staff were not wear the PPE's
15	Display of Material Safety Data Sheet (MSDS)/Do's & Don'ts	MSDS/Do's & Don'ts was displayed adequately on wharf area.	Found MSDS board @ wharf area.
16	Safety shower and eyewash facilities	Safety shower and eyewash facilities were not provided in wharf area where ammonium nitrate is handled.	To be complied.
17	Training to the drivers	On inquiry it is found the few Truck drivers were not trained on safety in handling of ammonium nitrate.	To be complied.
18	Training of workers	Workers were found not to be adequately trained to handle Ammonium nitrate bags.	To be complied.
19	Chances of cross contamination of AN	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	Found ok.

EXE (Env) F&ASO S.O i/c ATM(S)

10	Spillage.	Found spillage of Ammonium Nitrate on wharf area.	Found ok Advise the agent to avoid iron/ sharp edge tools for clearing the spill.
11	Use of sharp hooks/edges etc.	Iron shovel was used to clear the spilled Ammonium nitrate on wharf area.	Found some labour working with sharp objects. Instruct to AQF to replace the sharp objects.
12	Proper usage of PPEs	PPEs were provide to the workers engaged and also the dock workers.	Most of the private staff were not wear the PPE's
13	Display of Material Safety Data Sheet (MSDS)/Do's & Don'ts	MSDS/Do's & Don'ts was displayed adequately on wharf area.	Found MSDS board @ wharf area.
14	Safety shower and eyewash facilities	Safety shower and eyewash facilities were not provided in wharf area where ammonium nitrate is handled.	To be provided.
15	Chances of cross contamination of AN	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	No other cargos are stored near AN bags loading /un loading area / berth.
16	Equipment's.	Fork lifts, Mobile cranes and others	Found some of the not vehicles are fitted with reverse horns.
17	Training to the drivers	On inquiry it is found the few Truck drivers were not trained on safety in handling of Ammonium Nitrate.	Instruct the Berth Inchrge / AQF to conduct more Safety awareness classes to all the workers including Truck Drivers.
18	House Keeping		Found some unused, torn bags and other waste material. On the berth. Instruct the supervisor to clear the same (Housekeeping is to be improved.)

Safety Officer i/c 22/8.

Copy to: CME /DCME for kind information.

1 EXE(N) for information

विशाखपट्टणम पोर्ट प्राधिकरण
यांत्रिक एवं विद्युत अभियंता विभाग
प्रशासनिक भवन, पोर्ट क्षेत्र
विशाखपट्टणम - 530035
(आ.प्र.)

VISAKHAPATNAM PORT AUTHORITY
MECH & ELECTRICAL ENGG DEPARTMENT
Administrative Building, Port Area
Visakhapatnam - 530035 (A.P)

SAGARMALA

358

131269

SAFETY WING

No. IMEE/MOF/SW/QRA/
Dt. .07.2023

TRAFFIC MANAGER

Sub: Compliance of the field observations made by team, IR CLASS Systems and solutions Private Limited made during their QRA Study for Handling Ammonium Nitrate at Visakhapatnam Port Authority – Reg.

Ref: Your Ltr. No. ITRA/GEN/FMISC/1108, Dt 22.06.2023.

*****

Please refer to letter cited above. Where-in it was requested to coordinate with Asst. Director (Inspector Dock Safety) for conducting Inspection on the subject issue.

In this connection, it is to inform that, the subject issue has been communicated over phone to Asst. Director (Inspector Dock Safety). In response, he informed that, he doesn't have any authorisation to give report or NOC on the subject issue as per the Dock Workers regulations.

Also stated that, the subject matter is appraised to his Chief Inspector Dock Safety (CIDS), DGFASLI, Mumbai. Awaiting for further directions in this regard.

In view of the above, it is requested to arrange to carry out the follow-up Audit with ⊗ at your end as the subject issue was dealt by Traffic Department earlier.

⊗ any other statutory authorities

7/7

CHIEF MECHANICAL ENGINEER

Copy to PA to Dy. Chairperson for favour of Information to Dy. Chairperson please. P.S 7/7/23,

P.S 7/7/23
SO 'IIc

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Annexure II

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

भारत का राजपत्र
The Gazette of India

असाधारण
EXTRAORDINARY
भाग II—खण्ड 3—उप-खण्ड (ii)
PART II—Section 3—Sub-section (ii)
प्राधिकार से प्रकाशित
PUBLISHED BY AUTHORITY

सं. 1677] नई दिल्ली, बुधवार, जुलाई 17, 2013/आषाढ़ 26, 1935
No. 1677] NEW DELHI, WEDNESDAY, JULY 17, 2013/ASADHA 26, 1935

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 प्रयोग करते हुए केन्द्र सरकार, लोक हित में अमोनियम नाइट्रेट के आयात की अधिसूचना के विषय करते हुए, एतद्द्वारा कोलकाता, विशाखापत्तनम, पी.ओ. चिदम्बरनार और नवा मंगलौर पत्तनों को आयात में समुद्र मार्ग से अमोनियम नाइट्रेट के आयात हेतु अधिसूचित करती है।

[फा. सं. पीटी-11012/2/2011-पीटी]

एन. मुरुगानन्दम, अवर 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 Seaports of Mangalore for import of Ammonium Nitrate by sea.

[F. No. PT-11012/2/2011-PT]

N. MURUGANANDAM, Under Secy.

ANNEXURE - 19

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भारत सरकार, श्रम एवं रोजगार मंत्रालय
व्यावसायिक सुरक्षा स्वास्थ्य महानिदेशालय
GOVERNMENT OF INDIA, MINISTRY OF LABOUR & EMPLOYMENT
DIRECTORATE GENERAL FACTORY ADVICE SERVICE & LABOUR INSTITUTES
"व्यावसायिक सुरक्षा और स्वास्थ्य भवन", एन.एस. मंकीकर मार्ग, सियन, मुंबई - [illegible], भारत
"Vyavsayik Suraksha aur Swasthya Bhavan", N.S. Mankikar Marg, Sion, Mumbai - [illegible], India

DS-Enf/2/2023-HQ-Mum

Date: 18.11.2024

To
The Traffic Manager
Visakhapatnam Port Authority
Visakhapatnam, Andhra Pradesh

Subject: Report on Adequacy of safety measures by Visakhapatnam Port Authority at Visakhapatnam Port, Visakhapatnam for Import and handling of Ammonium Nitrate - Reg

Reference: 1. VPA letter No.ITRA/SHP/FAMN dated 07.11.2024.

2. CIDS, DGFASLI letter no.DS-Enf/2/2023-HQ-Mum dated 09.09.2024.

Sir,

This is with reference to the VPA's correspondence vide letter referred at sl. No. (1) regarding the compliance of safety measures for handling Ammonium Nitrate (AN) at Visakhapatnam Port, as detailed in this office report under reference at sl. No. (2). The following observations are made on the correspondence and its enclosures submitted:

1. Forwarding of Safety Adequacy Report: As requested by APPCB, the safety adequacy report prepared by DGFASLI has been forwarded to APPCB for their assessment and necessary action.
2. Review of Submitted Documents: The observations and comments provided by VPA, as well as the committee's observation on the same, have been reviewed. Enclosed herewith (Annexure 1) are the detailed comments for reference and required actions on part of VPA.

Also, while VPA has assured that no untoward incidents have occurred in recent years, proactive safety measures remain crucial to maintaining high safety standards. The effective implementation of both On-Site and Off-Site Emergency Plans is essential, especially given the substantial quantities of Ammonium Nitrate handled at the port.

This is issued with the approval of Chief Inspector of Dock Safety.

Yours faithfully,

Signed by Vipul Kumar Mishra
Date: 18-11-2024 18:57:20

(Vipul Kumar Mishra)
Director (Safety)
Dock Safety Division

I.A (5)/HA (4)

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Annexure-1

1. **On-Site Emergency Plan (OSEP):**

   While VPA has designated dedicated berths (EQ3, EQ4, EQ6, and EQ7) for AN handling, it is crucial to develop a comprehensive On-Site Emergency Plan as mandated by Rule 13 of the MSIHC Rules, 1989. This plan should include detailed procedures for managing chemical spills, fire incidents, and regular drills to train personnel, etc.

2. **Off-Site Emergency Preparedness:**

   This review indicates a lack of documented coordination between VPA and local authorities for Off-Site Emergency Planning. Given the significant volumes of AN handled, it is imperative to establish formal collaboration with the District Crisis Management Group, State Fire Brigade, and other emergency response teams to protect the surrounding community.

3. **Use of Dedicated Vehicles and Trained Personnel**

   The absence of protocols for deploying dedicated vehicles operated by trained personnel for AN transportation is a significant safety risk. It is recommended to implement measures for route demarcation, driver competency checks, and proper documentation of transport procedures.

4. **Competency Assessments and Training:**

   There is currently no documented evidence of structured competency assessments or regular training for personnel handling AN, especially regarding the proper use of Personal Protective Equipment (PPE). We strongly recommend conducting regular training sessions and assessments to ensure safety compliance.

5. **Safety Audits and Documentation:**

   It was observed that essential safety documents, such as Material Safety Data Sheets (MSDS) for AN, and annual safety audits were not readily available during our review. VPA is advised to conduct annual safety audits and maintain thorough documentation to ensure regulatory compliance.

6. **Enhanced Surveillance and Monitoring:**

   Inadequate surveillance was noted in non-storage critical areas, which increases the risk of undetected incidents. VPA should enhance its monitoring systems for real-time oversight, ensuring continuous surveillance in zones where hazardous materials are handled.

7. **Medical Response Preparedness:**

   There are gaps in the readiness of the medical team to handle AN-related incidents, particularly concerning exposure treatment, chemical burns, and inhalation injuries. It is recommended that VPA provides specialized training for its medical personnel and conducts regular emergency drills to ensure preparedness.

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ANNEXURE-20

VISAKHAPATNAM PORT AUTHORITY
TRAFFIC DEPARTMENT

No: TTRA/SHP/PAMN/152
Dt: 07.01.2025
08

302

To
The Director(Safety),
Dock Safety Division,
Directorate General Factory Advice Service & Labour Institutes
Ministry of Labour & Employment
Government of India
Mumbai -400 022

Sub: Report on Adequacy of safety measures by Visakhapatnam Port Authority at Visakhapatnam Port, Visakhapatnam Port, Visakhapatnam for import and handling of Ammonium Nitrate – Reg.

Ref: 1. VPA Letter No. TTRA/SHP/PAMN dated 07.11.2024
2. CIDS, DGFASLI letter no DS -.Enf /2/2023 – HQ-Mum dated 09.09.2024.
3. Director (Safety), Dock Safety Division, letter no: DS-Ent/2/2023-HQ-Mum. dt 18.11.2024.

In reference to the 3rd letter cited, the observations raised by Dock safety have been noted and will be complied with. The remarks of VPA for the points raised by Dock safety Division in their report under reference cited enclosed herewith.

Sl.No.	Points raised by Dock safety Division	Remarks by VPA
1	**On-Site Emergency Plan (OSEP)** While VPA has designated dedicated berths (EQ3, EQ4, EQ6 and EQ 7) for AN handling, it is crucial to develop a comprehensive On-site Emergency Plan as mandated by Rule 13 of the MSIHC Rules, 1989. This plan should include detailed procedures for managing chemical spills, fire incidents, and regular drills to train personnel, etc.	On-site emergency plan (OSEP) is attached a Annexure-1
2	**Off-Site Emergency Preparedness:** This review indicates a lack of documented coordination between VPA and local authorities for Off-Site Emergency Planning. Given the significant volumes of AN handled, it is imperative to establish formal collaboration with the District Crisis Management Group, State Fire Brigade, and other emergency response teams to protect the surrounding community.	Off-site emergency plan (OSEP) is attached a Annexure-2
3	**Use of dedicated Vehicles and Trained Personnel** The absence of protocols for deploying dedicated vehicles operated by trained	This port do not engage vehicles for transportation of cargo that is imported or exported through this port. The vehicles are engaged by the Stevedores / importer. The

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	personnel for AN transportation is a significant safety risk. It is recommended to implement measures for route demarcation, driver competency checks, and proper documentation of transport procedures.	Stevedores / Importers shall be insisted to engage dedicated vehicles as recommended. Ammonium Nitrate is handled at dedicated berths of VPA i.e., EQ 3, EQ 4, EQ 6 and EQ 7. All the vehicles designated for the subject berths move towards any one of the two gates i.e., MG gate or EQ 7 gate. Signages are already provided for individual berths along with route maps for cargo movement, whenever ammonium nitrate vessel berths, specific directions and designated routes are provided to the vehicles.
4	**Competency Assessments and Training** There is currently no documented evidence of structured competency assessments or regular training for personnel handling AN, especially strongly recommend conducting regular training sessions and assessments to ensure safety compliance.	Trainings arranged by HRDC to the stevedores, Agencies/private parties. The workers engaged in handling in AN are the regular staff employees of concerned agency. However, Port management ensures that the trained Dock workers are engaged for handling of Ammonium Nitrate at Port.
5	**Safety Audits and Documentation** It was observed that essential safety documents, such as Material Safety Data Sheets (MSDS) for AN, and annual safety audits were not readily available during our review. VPA is advised to conduct annual safety audits and maintain thorough documentation to ensure regulatory compliance.	Safety wing taken approval from Competent Authority to conduct Safety Audit for Handling & Transportation of Ammonium Nitrate (Fertiliser Grade) Vide Sanction order IM & EE/ MOF/SO/AN/23-24/3016, Dt 14.12.2024 and VPA is waiting for Ammonium Nitrate Vessel.
6	**Enhanced Surveillance and Monitoring** Inadequate surveillance was not noticed in non-storage critical areas, which increases the risk of undetected incidents. VPA should enhance its monitoring systems for real-time over sight, ensuring continuous surveillance in zones where hazardous material are handled.	There is no facility for storage of Ammonium Nitrate in the premises of Port area. Every entry into the Dock area either by personnel or vehicle is restricted or done only through valid pass provided and approved by authorised signatory of Port.
7	**Medical Response Preparedness:** There are gaps in the readiness of the medical team to handle AN-related incidents, particularly concerning exposure treatment, chemical burns, and inhalation injuries. It is recommended that VPA provides specialized training for its medical personal and conducts regular emergency drills to ensure preparedness.	

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VPA REMARKS

There are gaps in the readiness of the medical team to handle AN-related incidents, particularly concerning exposure treatment, chemical burns, and inhalation injuries. It is recommended that VPA provides specialized training for its medical personnel and conducts regular emergency drills to ensure preparedness.

1) Ammonia may enter the body as a result of skin contact, breathing and swallowing. It reacts with water to produce ammonium hydroxide and the chemical is very corrosive and damages cells in the body on contact.

2) Exposure to high concentrations of ammonia in the air causes immediate burning of the nose, throat and respiratory tract. This can cause bronchiolar and alveolar edema, and airway destruction resulting in respiratory distress or failure.

Inhalation of high concentrations of ammonium nitrate dust is irritating and corrosive and can cause respiratory tract irritation and may cause coughing, sore throat, shortness of breath, and suffocation

3) Chronic entry of ammonium nitrate through mouth of 6 to 12 grams/day may cause gastritis (stomach upset), acidosis, isosmotic diuresis, and nitrate toxicity manifesting as methemoglobinemia or vasodilation and shock with fall of blood pressure.

4) Skin contact with ammonium nitrate may cause chemical burns due to the damage of cells in the skin and the underlying tissues.

Readiness of Medical Department to handle AN related incidents, particularly concerning exposure treatment, chemical burns and inhalation injuries.

1) Port area hospital which is situated nearly at a distance of One KM from the dedicated berths for AN handling (EQ3, EQ4, EQ6 and EQ7)

The said hospital is functioning round the clock (24x7x365) and provides immediate emergency care to the different categories of patients requiring medical and surgical services and also for work spot areas during the inhalation of the ammonium nitrate.

After stabilization the patients will be shifted to the Golden Jubilee Hospital and necessary, to the local empanelled hospitals of VPA

2) During the handling of the ammonium nitrate incidents the following G.J. Hospi Disaster Management team will be alerted and emergency medical response will Initiated

G.J.HOSPITAL DISASTER MANAGEMENT TEAM

Chief Medical Officer	Dr S Usha Devi	6505574007
General Surgeon & Sr.Dy.CMO -	Dr. B.Babu Rao	8547544252
Orthopedic Surgeon & Dy.CMO -	Dr.P. Ravi Sharma	7660881155
General Physician & Medical Officer	Dr B Akhila	9951591379

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Matron	-G Sujata Tony Xavier	8427184141
Operation Theatre Sister	-G Tulasi Ratnam	9959151512
Sr X-ray Technician	-G R.R.Chetan	9247139968
Sr Lab. Technician	-T Usha Rani	9603247966
Hospital security in-charge	-D Umadh (CISF)	8801140125
Hospital BMW maintenance	-Roja	9676623569
Hospital electrical maintenance in charge	-S.Appa Rao	9618190531

3) All the essential medical and surgical items are made available at the Port area hospital and at G.J.Hospital to attend any incidents related to ammonium nitrate exposure at Identified areas

PPE kits
Medicines - Analgesics, antibiotics and bronchodilators
Methylene Blue injections
Surgical items - sterile pads, bandages, ointments, to treat chemical burns
Oxygen cylinders
Ambulances equipped with neecessary trained first-aiders with first-aid equipment

First-aid and treatment protocol for the ammonium nitrate exposure, chemical burns a inhalation injuries.

Specialized medical training to the hospital staff

Information regarding the safety measures, first-aid and management of work effected by the incidents related to ammonium nitrate handling and transportation provided to the hospital staff of first-aid canters in the Dock area, Port area hospital and Golden Jubilee Hospital.

Regular emergency drills will be conducted in association with Safety Division, F Section and T.M. Department.

In any incident involving ammonium nitrate exposure should be prevented by using PPE.

Management of chemical burns

1. Assess general condition of the affected person, extent, depth and nature of burns.
2. Check age, concomitant diseases and associated injuries (airway, breathing and circulation (ABC)).
3. Check for signs of circulation, breathing, and movement, if none initiate cardiopulmonary resuscitation (CPR).
4. Assess for inhalation injury history of the fire in closed space, facial burns, singer nasal hairs, eyebrows, hoarseness of voice, facial edema, swelling of lips, and ora mucosa.
5. Burnt area should be cooled immediately with tap water (preferably running water) for a least 10-15 minutes.
6. In case of chemical burns, wash off the chemical by running water for at least 2 minutes or till litmus test is negative.
7. Rings and bracelets to be removed from the affected area as they may cause constriction when edema occurs.
8. Remove clothing from the burned area but do not pull the cloth if stuck.
9. Cover burned area with clean cloth before going to the hospital, to prever contamination and hypothermia.

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Inhalation injuries

1. The effected persons have to be moved from the site of the incident immediately.
2. Administration of humidified oxygen.
3. Airway management.
4. Treatment of skin and eyes irrigation with plenty of water
5. Administration of bronchodilators.
6. Administration of Injection Methylene Blue

In view of the above, you are requested to forward the same to APPCB so as to enable them to issue NOC to VPA for handling import Ammonium Nitrate (Fertilizer grade) Vessels at VPA.

03/01/2025

TRAFFIC MANAGER i/c

Copy to: 1.) Member Secretary, AP Pollution Control Board, Vijayawada

2.) Special Chief Secretary to the Govt. of Andhra Pradesh,
Environment, Forests and Science & Technology Department,
AP Secretariat, Velagapudi,
Amaravathi, Andhra Pradesh.

DTM(S) 7/1/25

ATM(S)

As per instructions, a letter put up for approval & signature pls.

HA(S)

JA(S) 7/1

08/01/2025
प्रेषित किया गया

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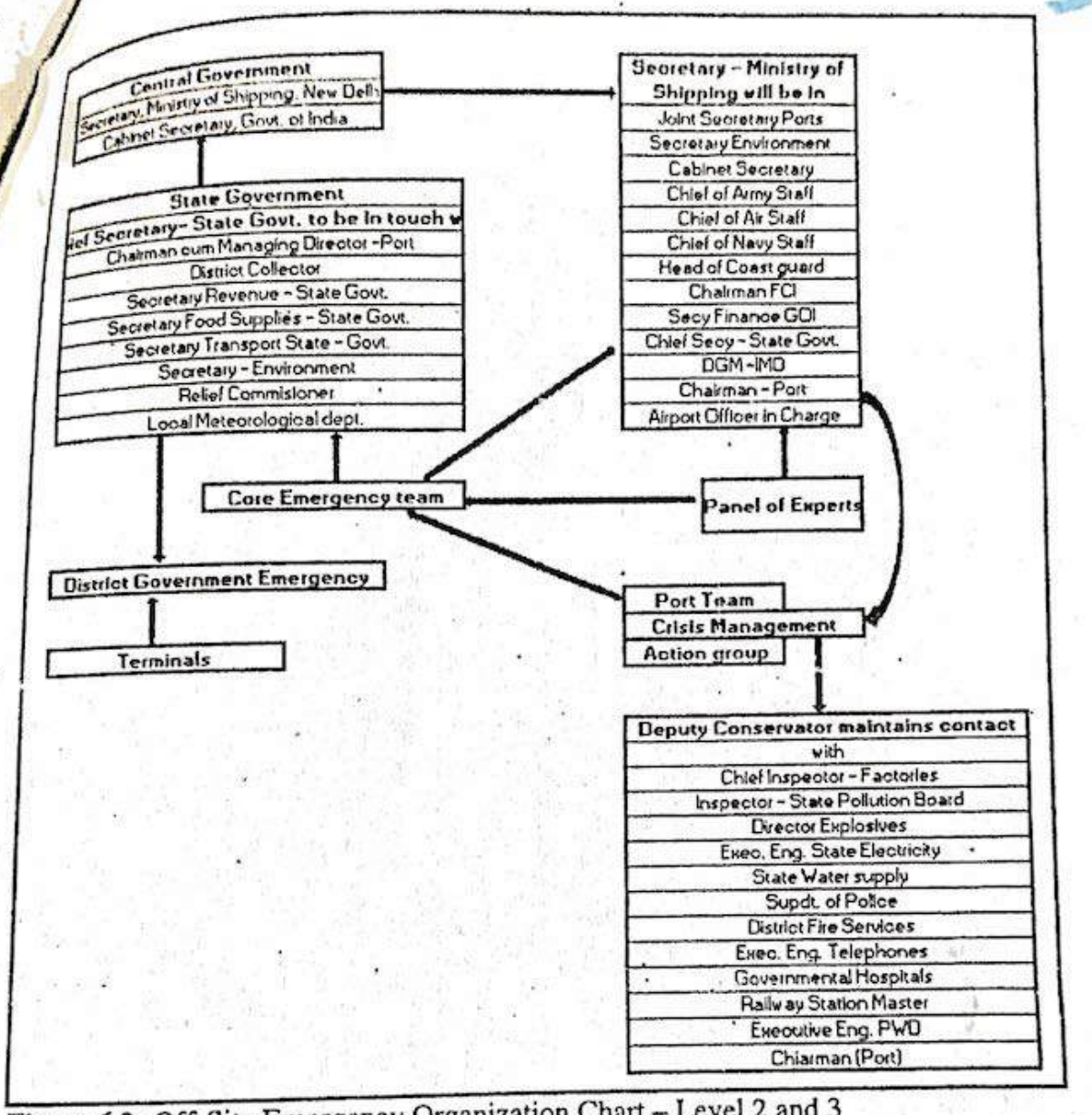


Figure 6.3: Off-Site Emergency Organization Chart – Level 2 and 3

6.7 RESCUE AND RELIEF OPERATION

VPT has a procedure to arrange refugee places during emergencies.

Sr. no	Refugee places
1.	Kailasapuram
2.	Salagramapuram

Help of the following voluntary organizations may be taken for the rescue and relief operation.

Home Guard	
Assistant Section Officer	26712927

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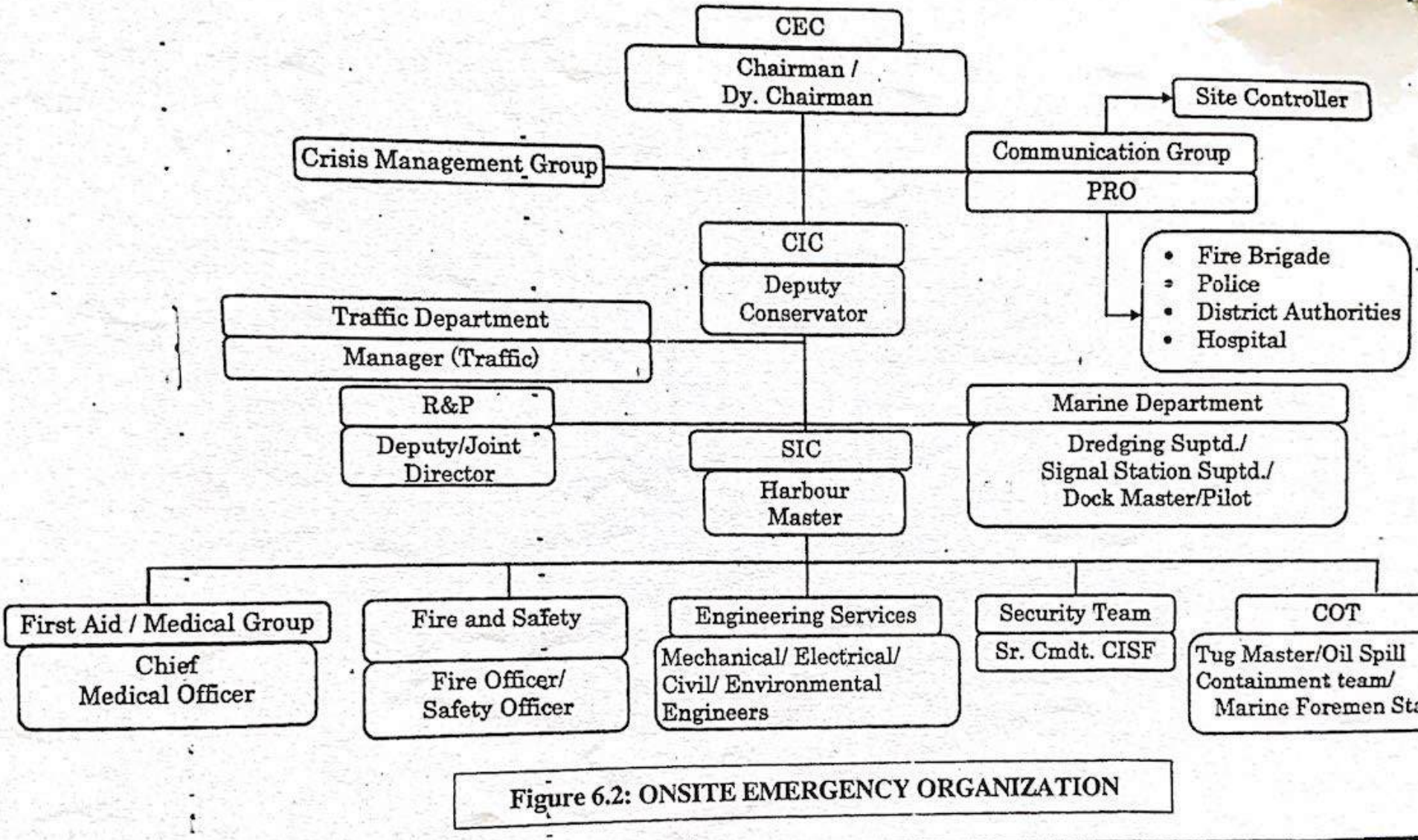


Figure 6.2: ONSITE EMERGENCY ORGANIZATION

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ANNEXURE-21

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मुख्य यांत्रिक अभियंता का कार्यालय
Chief Mechanical Engineer
D.877
05 FEB 2025
Visakhapatnam Port Authority
विशाखपट्टणम पोर्ट प्राधिकरण

VISAKHAPATNAM PORT AUTHORITY
TRAFFIC DEPARTMENT

No: ITRA/SHP/FAMN/1401
Dt: 04.02.2025

To
The Director (Safety)
Dock Safety Division,
Directorate General Factory Advice Service & Labour Institutes
Ministry of Labour & Employment
Government of India
Mumbai -400 022.

Sir,

Sub: Report on Adequacy of safety measures by Visakhapatnam Port Authority at Visakhapatnam Port, Visakhapatnam for import and handling of Ammonium Nitrate – Reg.

Ref: 1. VPA Letter No. ITRA/SHP/FAMN dated 07.11.2024
2. CIDS, DGFASLI letter no DS -.Enf /2/2023 – HQ-Mum dated 09.09.2024.
3. Director (Safety), Dock Safety Division, letter no: DS-Ent/2/2023-HQ-Mum, dt 18.11.2024.
4. VPA Letter No. ITRA/SHP/FAMN dated 07.01.2025

In continuation to this office letter 4th cited, it is inform that the revised remarks of VPA with regard to Sl. No 1, 2, 3, 4, 5, & 6 are furnished here under. The remarks furnished with regard to Sl.No.7 i.e., Medical Response Preparedness furnished vide reference 4th cited are stands good.

Sl. No.	DGFASLI, Dock Safety Division Comments	Action Taken/Compliance made by VPA
1.	On-Site Emergency Plan (OSEP): While VPA has designated dedicated berths (EQ3, EQ4, EQ6, and EQ7) for AN handling, it is crucial to develop a comprehensive On-Site Emergency Plan as mandated by Rule 13 of the MSIHC Rules, 1989. This plan should include detailed procedures for managing chemical spills, fire incidents, and regular drills to train personnel, etc.	As per the mandate of Rule 13 of the MSIHC Rules, 1989, VPA has developed a Disaster Management Plan, which includes procedures for managing chemical spills, fire incidents, and regular drills to train personnel in handling various scenarios (VPA's Disaster Management Plan refer to pages 93 to 113 of Annexure-I). Furthermore, VPA has developed an On-Site Emergency Plan as part of the Disaster Management Plan (VPA's Disaster Management Plan refer to pages 63 to 75 of Annexure-I), which clearly outlines the functions, roles, and responsibilities assigned to authorized personnel to effectively manage any untoward incidents or disasters.
2	Off-Site Emergency Preparedness: This review indicates a lack of documented coordination between VPA and local authorities for Off-Site Emergency Planning. Given the	Visakhapatnam Port Authority has collaborated with the District Crisis Management Group, State Fire Brigade, and other emergency response teams to ensure the safety of the surrounding community. VPA participated in the District Crisis Group Meeting held in Visakhapatnam on 16-07- 2024 at

	significant volumes of AN handled, it is imperative to establish formal collaboration with the District Crisis Management Group, State Fire Brigade, and other emergency response teams to protect the surrounding community.	10:00 AM under the chairmanship of the Collector & District Magistrate at the Collectorate Conference Hall, Visakhapatnam. During the meeting, the Chairman addressed the Visakhapatnam Port Authority regarding the import of ammonium nitrate, emphasizing the need for stringent safety measures. (Please refer to Para No. 15 of the Minutes of the Meeting of the District Collector & District Magistrate attached as Annexure-II).
3	Use of Dedicated Vehicles and Trained Personnel: The absence of protocols for deploying dedicated vehicles operated by trained personnel for AN transportation is a significant safety risk. It is recommended to implement measures for route demarcation, driver competency checks, and proper documentation of transport procedures	This port do not engage vehicles for transportation of cargo that is imported or exported through this port. In the current practice, vehicles (trucks/trailers) and personnel (drivers and signalers) are deployed by the concerned importers and stevedores. As the Port Authority, VPA conducts driver competency checks, such as verifying valid driving licenses and vehicle fitness-related documents. Furthermore, VPA, being the Port Authority, has demarcated specific routes for the transportation of Ammonium Nitrate at EQ3, EQ4, EQ6, and EQ7. However, while acknowledging the comments of DGFASLI, VPA will undertake a comprehensive review of the current transportation framework to identify gaps and align practices with the applicable statutory and regulatory requirements. Measures such as route demarcation, driver competency verification, and thorough documentation of transport procedures will be considered to enhance overall safety and compliance. Furthermore, necessary actions will be initiated to develop and implement Standard Operating Procedures (SOPs) in accordance with prevailing legal and regulatory frameworks to effectively mitigate associated risks.
4	Competency Assessments and Training: There is currently no documented evidence of structured competency assessments or regular training for personnel handling AN, especially regarding the proper use of Personal Protective Equipment (PPE). We strongly recommend conducting regular training sessions and assessments to ensure safety compliance	Trainings arranged by HRDC to the stevedores, Agencies/private parties. The workers engaged in handling in AN are the regular staff employees of concerned agency. However, Port management ensures that the trained Dock workers are engaged for handling of Ammonium Nitrate at Port. Currently, Ammonium Nitrate handling activities are being carried out by booking of CHD gangs (Cargo Handling Division of Traffic Department) workers through the concerned stevedores/agencies, as well as by their own workers.

		With respect to CHD workers and stevedores/agencies, HRDC, VPA has been imparting periodic training to them on the safe handling of Ammonium Nitrate. Furthermore, VPA ensures the proper use of PPE by workers involved in Ammonium Nitrate handling. However, while acknowledging the comments of DGFASLI, efforts will be made to develop comprehensive training modules aligned with industry best practices and regulatory guidelines. Additionally, appropriate record-keeping mechanisms will be implemented to document training sessions, competency evaluations, and compliance status to ensure continued adherence to safety standards.
5	Safety Audits and Documentation: It was observed that essential safety documents, such as Material Safety Data Sheets (MSDS) for AN, and annual safety audits were not readily available during our review. VPA is advised to conduct annual safety audits and maintain thorough documentation to ensure regulatory compliance.	The Manufacturer supplied Material Safety Data Sheet (MSDS) for Ammonium Nitrate is available with Visakhapatnam Port Authority (VPA), Visakhapatnam, and the same has been enclosed with this report as Annexure- III for your kind review. VPA, Visakhapatnam, has conducted a comprehensive annual safety audit for Ammonium Nitrate handling through the Safety Audit Team, DGFASLI, Mumbai, from 06.10.2022 to 07.10.2022, and the Safety Audit Report (attached as Annexure-IV) was subsequently furnished to VPA. The recommendations made in the report have been duly complied with by VPA within the stipulated time. Further QRA also has been carried out as per the Audit recommendations (Copy has been attached as Annexure-V for your kind review). Further, for the year 2024, to carry out the comprehensive annual safety audit for Ammonium Nitrate handling at VPA, the Safety Wing, Visakhapatnam Port Authority, has obtained approval from the competent authority vide Sanction Order No. IM & EE/MOF/SO/AN/23-24/3016,dated 14.12.2023. VPA is currently awaiting the arrival of the Ammonium Nitrate vessel at Visakhapatnam Port to carry out the Safety Audit.

6	Enhanced Surveillance and Monitoring: Inadequate surveillance was noted in non-storage critical areas, which increases the risk of undetected incidents. VPA should enhance its monitoring systems for real time oversight, ensuring continuous surveillance in zones where hazardous materials are handled.	There is no facility for storage of Ammonium Nitrate in the premises of Port area. Every entry into the Dock area either by personnel or vehicle is restricted or done only through valid pass provided and approved by authorized signatory of Port. The security and surveillance of Visakhapatnam Port Authority (VPA), Visakhapatnam, are being managed by CISF personnel. Their duties include ensuring the valid and secure entry and exit of personnel, vehicles, and cargo at the cargo handling area gates by verifying the RFID passes issued to the respective personnel and vehicles by VPA. Furthermore, the Quick Response Team (QRT) of the CISF conducts surveillance of non-storage critical areas and ensures continuous 24x7 monitoring in zones where hazardous materials are handled. However, while acknowledging the comments of DGFASLI, VPA will take necessary steps to enhance the monitoring systems to ensure real-time oversight and continuous surveillance across all relevant zones. This will include a comprehensive assessment of the existing surveillance infrastructure and the implementation of appropriate technological upgrades to Strengthen incident detection capabilities.

In view of the above, you are requested to forward the same to APPCB so as to enable them to issue NOC to VPA for handling import Ammonium Nitrate (Fertilizer grade) Vessels at VPA.

Encl: As above

4/2/25

TRAFFIC MANAGER i/c

Copy to: 1.) Chairman, APPCB
2) Member Secretary, AP Pollution Control Board, Vijayawada
3) Special Chief Secretary to the Govt. of Andhra Pradesh, Environment, Forests and Science & Technology Department, AP Secretariat, Velagapudi, Amaravathi, Andhra Pradesh.

4) PS to Chairperson/VPA for information of Chairperson
5) PS to Dy. Chairperson/VPA for information of Dy. Chairperson
6) CME/CE/DC for information.

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Minutes of the District Crisis Group Meeting, Visakhapatnam held on 16-07-2024 at 10:00 AM under the Chairmanship of Collector & District Magistrate in Collectorate Conference Hall, Visakhapatnam.

1)The District Crisis Group meeting of Visakhapatnam district was held under the Chairmanship of Collector & District Magistrate in Collectorate Conference Hall, Visakhapatnam on 16-07-2024 at 10 AM.

2)The list of members and other stake holders is annexed.

3).The Deputy Chief Inspector of Factories in Visakhapatnam extended a warm welcome to the Chairman, members of the District Crisis Group (DCG), and all dignitaries from various institutions. With the Chair's approval, the meeting commenced with a briefing on the functions and responsibilities of the DCG.

4)The Deputy Chief Inspector outlined the key roles of the DCG, which include the preparation and review of district off-site emergency plans, evaluating all on-site emergency plans prepared by Major Accident Hazard (MAH) units, and assisting the district administration in managing chemical accidents. The DCG is also responsible for the continuous monitoring of chemical accidents, ensuring a steady flow of information between the district, central, and state crisis groups, and forwarding reports of chemical accidents to the state crisis group.

Furthermore, the Deputy Chief Inspector emphasized the importance of conducting at least one full-scale off-site mock drill annually.

5).In the previous meeting, the Chairman issued a directive to all major accident hazard (MAH) factories to conduct mock drills involving the National Disaster Response Force (NDRF) and the Navy. This instruction aimed to utilize their expertise to enhance the effectiveness of these drills. Consequently, all major factories have begun inviting the NDRF and the Navy to participate in their on-site mock drills.

6)Another critical resolution discussed was the need to establish a public alert system for accidental releases of hazardous gases, including toxic and flammable gases. The Chairman directed all MAH units to implement this mechanism. As a result, six factories were identified for the installation of such alert systems. Among these, M/s Coromandel International Ltd and M/s GAIL India Ltd have successfully installed the required sensors. However, M/s Andhra Petro Chemicals Limited, M/s East India Petroleum Limited, M/s SALPG, and M/s SHV have yet to comply.

The Chairman expressed concern over the delays and highlighted the urgent necessity to establish an alert system outside factory premises. The discussion referenced the LG Polymers incident, where the public remained unaware of a

leakage until it resulted in severe adverse reactions, including deaths and hospitalizations. It was emphasized that a robust alert mechanism is essential to prevent such scenarios and ensure public safety. The Chairman instructed the factories to expedite the installation of sensors and alert systems to address this urgent need effectively.

During the meeting, Mr. Lakshmana Rao, the Safety Officer at Andhra Petrochemicals Limited, reported that the nearest habitation is located beyond a 2 km radius from their facility. To address this, they have installed a 5 km range emergency siren, which is tested daily. He also noted that the hazard radius of their operations is only 1.2 km and emphasized that their facility is surrounded by other industries such as Coromandel and HPCL Refinery, with no public habitations in the vicinity.

Mr. Sharriff from M/s EIPL committed to installing the necessary sensors within the next three months. Despite the absence of any habitations within a 3 km radius, and the presence of a 5 km range siren and public awareness programs, the Revenue Divisional Officer pointed out that naval quarters are located near the installation site. Consequently, the management agreed to install the sensors with an alert mechanism within the specified timeframe .

Mr. Chandra Sekhar from M/s SALPG reported that their terminal is situated at the LPG Jetty, approximately five kilometers from the nearest habitation. The nearby locations include VPA and HSL, along with neighboring industries like ISPRL. He highlighted that the only concern is with the cross-country pipeline of HPCL. However, HPCL has already installed detectors in this pipeline, and the alarm system is designed to send mobile alerts to activate emergency responses. The Chairman stressed the importance of ensuring that alert mechanisms are consistently in place and that nearby industries are adequately informed. This system must be closely monitored to prevent any lapses.

A representative from SHV Energy mentioned that their nearest habitation is located more than a kilometer away. However, they are prepared to install the necessary sensors if required.

The Chairman emphasized the urgency of the matter, underscoring the need to prevent any loss of life, whether human or animal, due to future incidents. He highlighted the importance of implementing a robust alarm system to alert people and ensuring their safety in the event of any hazards and directed to comply with the same within three months.

7)The Member Secretary reported that all factories have submitted their onsite emergency plans to the department, which has been complied. However, the factories have been advised to revise their onsite emergency plans based on

qualitative and quantitative risk analysis. The Chairman has also instructed that these plans should be updated to reflect any changes.

8)During the last meeting, the Chairman instructed all Major Accident Hazard (MAH) factories to obtain a No Objection Certificate (NOC) from the fire department and ensure its renewal within the prescribed timeframe. In response, Mr. Renukaiah, the District Fire Officer (DFO), expressed satisfaction with the compliance of most industries. Additionally, the Chairman directed all factories to invite the fire department to their mock drills to benefit from their expertise.

Mr. Renukaiah highlighted a shortage of resources within the fire department and the Chairman requested that MAH units consider supporting these infrastructural needs as part of their Corporate Social Responsibility (CSR) initiatives. The Chairman also assured that he would bring this issue to the attention of the state government to seek further assistance.

Furthermore, Mr. Renukaiah encouraged all factories to utilize the fire department's 3-day basic firefighting training program for their workers. The Chairman echoed this recommendation, stressing the importance of participating in these training sessions.

9) Recent industrial accidents have been reviewed, with several significant incidents highlighted for discussion:

(i). RINL Accident on 11-02-2023: An accident occurred at RINL where hot molten slag splashed over ten workers, resulting in injuries. The incident was thoroughly investigated, and a complaint was filed in court. During the review, the Chairman inquired about the facility's burn injury treatment capabilities. The representative from RINL reported that while they were previously well-equipped for such cases, they are now referring burn cases to corporate hospitals. The Chairman recommended that all management teams consult with doctors from KGH, who specialized in plastic surgery and burn injuries, or refer cases to them. KGH has a reputation for treating severe burns, including cases with 70% to 80% coverage, despite being slightly less equipped. The Chairman urged the management to support KGH Hospital to enhance its capabilities, as this collaboration would benefit both the hospital and the industry units. It was suggested that a visit to the hospital could help assess its capabilities and determine whether cases beyond the facilities' current capacity could be managed there. The Chairman also inquired about insurance coverage for all workers.

(ii). HPCL Refinery Incident on 27-02-2023: Another serious accident occurred at the HPCL refinery, resulting in a pool fire that caused one fatality and injuries.

(iii). HPCL Refinery Incident on 30-05-2023: A subsequent incident at the HPCL refinery involved an explosion caused by a liquid nitrogen bomb while checking sample collections, resulting in another fatality.

The Chairman emphasized the critical importance of proactive safety measures, noting that safety is not an optional consideration but a fundamental necessity. He stressed the need for continuous and proactive steps to prevent such incidents and expressed hope that all facilities are already engaged in regular checks and training related to industrial safety.

10)The district off-site mock exercises were recently conducted at two locations: one at M/s Andhra Petrochemicals Limited and another at M/s Chemtech Alkoxide Pvt Ltd, VSEZ, Duvvada on 07.03.2024. A third off-site mock exercise took place at M/s Coromandel International Limited on 28.06.2024.

The Member Secretary reported that all identified major accident hazard (MAH) factories have been instructed to carry out on-site mock drills twice annually in the months of February and September as per the resolution of recent State Crisis Group meeting and all the MAH-A and B1 factories are already informed accordingly.

11).The chairman reviewed about the functioning of Local Crisis Groups in the district and instructed the RDO Visakhapatnam and RDO Bheemili to conduct meetings as per the schedules.

12).Member secretary informed that the district off-site emergency plan which was initially prepared in 2007, has not been updated since its inception. Consequently, a decision has been made to review and revise the plan within the next three months. To facilitate this, a committee consisting of four safety officers has been established, and quotations have been solicited from reputable organizations. The Chairman stressed the urgent need to address this matter, noting that the 2007 plan is outdated. To avoid further delays, he emphasized the importance of expediting the revision process and instructed the member secretary and all MAH-A factories to identify a reputed organization for revising the off site emergency plan aiming to complete the process by 31.10.2024.

13).The Member Secretary provided an update on the Industrial Emergency Response Centre (IERC) in Visakhapatnam, which was originally established in 2010. Initially, the IERC was situated in the Fishing Harbor area, then it was relocated to M/s RINL, and currently, it is based in Parawada Pharmacity of Anakapalli District.

It has been recognized that the IERC needs to be relocated back within the jurisdiction and limits of Visakhapatnam for better accessibility and operational efficiency. During the meeting, it was resolved to reconstitute the IERC for

Visakhapatnam and to finalize a new location in close consultation with relevant stakeholders.

14)The Chairman referred the major accident in a cement factory in NTR Krishna district to underscore the urgent necessity of addressing safety concerns in industrial establishments and stressed the importance of reassessing safety protocols and ensuring that everything is in proper order, emphasizing the need for adequate training for staff handling various processes, reactors, valves, and other equipment. He pointed out that panic often leads to mishandling situations, which can be mitigated through multiple trainings and mock drills by building up confidence.

He mentioned that industrial accidents typically occur during times of laxity or lethargy within the system, stressing the importance of being particularly vigilant during these periods. He advised ensuring that all staff, including those temporarily deployed from other units, receive proper training. He highlighted the need for a clear emergency response protocol within the on-site plan, including knowing whom to contact in local government, district administration, health services, and fire departments. They also emphasized the importance of having a public alert mechanism in place.

Furthermore, the chairman mentioned the matrix to clarify responsibilities, accountability, consultation, and information in case of incidents. He reiterated the need for comprehensive emergency plans covering communication with emergency services and local authorities. He urged revisiting on-site emergency plans and aligning them with the three-month timeline for off-site emergency planning.

15. The Chairman addressed the Vishakhapatnam Port Authority regarding the import of ammonium nitrate, emphasizing the need for stringent safety measures. He advised double-checking and triple-checking protocols to avoid repeating past mistakes observed in similar incidents in India and elsewhere. He mentioned that the facility shall ensure no storage of products on their premises, as everything is delivered and sent out immediately. He emphasized that they conduct regular safety practices and involve fire services and other agencies in safety surveys to continually improve their processes based on timely inputs.

He also highlighted the importance of ensuring adequate safety during transit. The Chairman raised a concern about M/s LG Polymers, mentioning that there is a directive to relocate the facility to Sri City, Chittoor. While shifting the equipment, officials from various departments such as Pollution Control Board, Factories and Fire Services and industry representatives shall involve and stressed the need for the shifting operation to be carried out without any inconvenience to the public or risk to the employees involved.

He assured that orders will be given from the district side to ensure necessary precautions during the shifting process and reiterated the importance of these measures to all present.

Mr. Nagaraju, Safety officer of M/s Coromondal International Limited presented best practices in safety at their organization and with the permission of chair the meeting was concluded with vote of thanks.

The following decisions were taken in the District Crisis Group meeting.

1.The Chairman directed M/s Andhra Petro Chemicals Limited, M/s East India Petroleum Limited, M/s South Asia LPG Company Private Limited, and M/s SHV Energy Private Limited to establish a public alert system for accidental releases of hazardous gases, including toxic and flammable gases near public habitat outside their factory premises within three months.

(Action:-Factories Department , M/s Andhra Petro Chemicals Limited, M/s East India Petroleum Limited, M/s South Asia LPG Company Private Limited and M/s SHV Energy Private Limited)

2. The Chairman directed all the MAH factories to update their onsite emergency plans based on the recommendations of qualitative and quantitative risk analysis reports.

(Action:-Factories Department, Pollution Control Board and All MAH Factories in the district)

3. The Chairman directed Revenue Divisional Officer ,Visakhapatnam and Revenue Divisional Officer ,Bheemili to conduct meetings of Local Crisis Groups of both these divisions as per the time line stipulated in rules.

(Action:-Inspector of Factories , Visakhapatnam, Revenue Divisional Officers of Visakhapatnam & Bheemili).

4. The chairman directed to reconstitute Industrial Emergency Response Centre (IERC) of Visakhapatnam with the members as specified in bylaws and convene the meeting at the earliest.

(Action:-Deputy Chief Inspector of Factories , Visakhapatnam)

5. The chairman instructed the member secretary and all MAH-A factories to identify a reputed organization for revising the off site emergency plan of this district with an aim to complete the process by 31.10.2024.

(Action:-Deputy Chief Inspector of Factories , Visakhapatnam and All MAH Factories in the district).

6. The chairman instructed the Vishakhapatnam Port Authority officials to follow all the safety protocols while import of ammonium nitrate and other hazardous chemicals, emphasizing the need for stringent safety measures and ensure minimum quantity of storage in the port premises.

(Action:-Visakhapatnam Port Trust Officials & Pollution Control Board)

Following the discussions, the Deputy Chief Inspector of Factories, Visakhapatnam concluded the meeting with a vote of thanks.

// Approved the Minutes //

Collector & District Magistrate,
Visakhapatnam District.
(Chairman of the Group)

Annexure:-
The list of members and other stake holders attended the meeting.

1. Sri. M. N.Harendhira Prasad, IAS	District Collector, Visakhapatnam	Chairman
2. Sri. J.Sivasankara Reddy	Joint Chief Inspector of Factories, Visakhapatnam	Special Invitee
3. Sri. V. Suresh	Deputy Chief Inspector ofFactories, Visakhapatnam	Member Secretary
4. Srl. S.Renukaiah	District Fire Officer,	Member

	Visakhapatnam	
5. Sri. D. Hussain Saheb	Revenue Divisional Officer, Visakhapatnam	Member
6. Sri. K. Sudhakar	Inspector of Factories, Visakhapatnam – I.	Member
7. Sri. K. Padma Latha	Spl. Deputy Collector, Civil Defence, Visakhapatnam.	Member
8. Sri. P. Ganapathi Rao	Superintendent Engineer, Public & Health, Visakhapatnam	Member
9. Sri. M. Butchi Raju	O/O District Transport Commissioner, Visakhapatnam	Member
10. Sri. K.Appala Swamy	Joint Director, Agriculture, Visakhapatnam	Member
11. Sri. P. V.MukhundaRao	R.O, A.P. Pollution Control Board, Visakhapatnam.	Member
12. Sri. Ch. Ganapathi	General Manager, District Industries Center; Visakhapatnam.	Special Invitee
13. Sri. D. Narayana Rao Divl. PRO.	District Public Relation Officer, Visakhapatnam. (Representative Present)	Member
14. Sri. N.Satish Kumar,	Asst. Manager – Safety, Divi's Laboratories Limited, Unit-II, Chippada, Bheemili (Representative Present)	Member
15. Sri. Brahma Bondare	DGM – Safety, HPCL –Visakh Refinery ; Visakhapatnam	Member
16. Sri. D. Rama Prasad	GM- Safety & HOD, Rastriyalspat Nigam Ltd,	Member

	Visakhapatnam Steel Plant, Visakhapatnam	
17. Sri. SFH Sharif	General Manager –. (Projects & Regulatory), East India Petroleum Pvt. Ltd., Visakhapatnam	Member
18. Sri. M. V. S.Murthy	Representative of Industry General Manager GAIL (India) Limited, VPT Road, Visakhapatnam (Representative Present)	Member
19. Sri. L.SrinivasaRao	General Secretary, Coromandel Fertilizers Visakhapatnam (Representative of Trade Union)	Member
20. Sri. K. Kumar Raju CFO,	Visakhapatnam Port Authority, Visakhapatnam	Special Invitee
21. Sri. Gagan S	Manager – Fire & Safety, HPCL –Visakh Refinery Malkapuram, Visakhapatnam	Special Invitee
22. Sri. Pradeep,	Asst. Manager – (OPS), Indian Oil Corporation Ltd., (Visakha Terminal), Malkapuram, Visakhapatnam.	Special Invitee
23. Sri. D. Naga Raju,	AGM (EHS) Coromandel International Ltd., Sriharipuram,Malkapuram, Visakhapatnam.	Special Invitee
24. Sri. M.LakshmanaRao,	Addl. GM (Safety) The Andhra Petrochemicals Ltd., Opp. Naval Dockyard, Visakhapatnam.	Special Invitee
25. Sri. SrinivasaRao,	Addl. GM (OPS) The Andhra Petrochemicals Ltd., Opp. Naval Dockyard, Visakhapatnam.	Special Invitee
26. Sri. Y. Srinath,	Chief Manager (HSSE) Bharat Petroleum Corporation Ltd., Visakhapatnam.	Special Invitee

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27. Sri. M.Sravan,	Safety Officer, East India Petroleum Pvt. Ltd, Visakhapatnam.	Special Invitee
28. Sri. Sunil Kumar V.O,	Senior Manager (F & I), GAIL (India) Limited, Visakhapatnam.	Special Invitee
29. Sri. A. V. Chandra Sekhar,	Manager (HSE), South Asia LPG Company Ltd, Visakhapatnam.	Special Invitee
30. Sri. Kamesh Kumar Diwakar,	DGM (OPS), HPCL (Black Oil Terminal), Visakhapatnam.	Special Invitee
31. Sri. Ramesh K. P.,	DGM – Installations HPCL- Visakha LPG Terminal, Visakhapatnam.	Special Invitee
32. Sri. Sudheer K,	DSO, HPCL- Visakha LPG Terminal, Visakhapatnam.	Special Invitee
33. Sri. G.Prashanth Kumar,	Safety Officer, HPCL (White Oil Terminal), Visakhapatnam.	Special Invitee
34. Sri. M.Sampath Ganesh,	Safety Officer, SHV Energy Pvt. Ltd, (Super Gas), Pendurthi, Visakhapatnam.	Special Invitee
35. Sri. I Alam Ansari,	In - Charge, SHV Energy Pvt. Ltd, (Super Gas), Pendurthi, Visakhapatnam.	Special Invitee
36. Sri. K. Sunil Kumar,	Head - HR, Hinduja National Power Corporation Ltd, Pedagantyada Visakhapatnam.	Special Invitee
37. Sri. N.Appala Raju,	Fire & Safety In-Charge, Indian Strategic Petroleum Corporation Limited, Visakhapatnam.	Special Invitee

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38. Sri. K.Noohar,	Safety representative, Divi's Laboratories Limited, Unit-II, Chippada, Bheemili, Visakhapatnam. (Representative Present)	Speclal Invitee
39. Sri. VidyaSagar T,	DGM - CGD, IOCL – Pipe Line Division, Nadupuru, Pedagantyada, Visakhapatnam.	Special Invitee

****

Digitally Signed by M N Harendhira Prasad
Date: 26-07-2024 22:32:59
Reason: Approved

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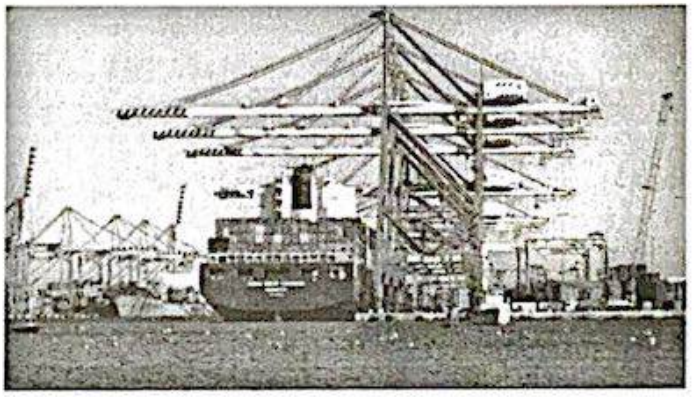
IRCLASS
SYSTEMS AND SOLUTIONS PRIVATE LIMITED

Quantitative Risk Assessment (QRA) for Ammonium Nitrate Handling at VPA



VISAKHAPATNAM PORT AUTHORITY

Port Area, Visakhapatnam-530 035, Andhra Pradesh



Site Visit: 12th - 13th May 2023

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Acknowledgement

We, IRCLASS Systems and Solutions Private Limited are obliged to the Management representative and Employees of Visakhapatnam Port Authority, Andhra Pradesh for their co-operation and support to the IRCLASS Systems and Solutions Private Limited Team during the Quantitative Risk Assessment (QRA).

SIGN-OFF SHEET			
Project Name	QRA STUDY FOR AMMONIUM NITRATE HANDLING AT VISAKHAPATNAM PORT AUTHORITY	**HAZOP Study Conducted by**	IRCLASS Systems and Solutions Pvt. Ltd., 52-A, Adi Shankaracharya Marg Opp Powai Lake, Powai, Mumbai – 400072
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Abbreviations:

AN	Ammonium Nitrate
QRA	Quantitative Risk Assessment
VPA	Visakhapatnam Port Authority
PHAST	Process Hazard Analysis Software
UDM	Unified Dispersion Model
HSE	Health Safety Executive, UK
TNT	Tri Nitrotoluene
Te	Tonnes Equivalent
ALARP	As Low As Reasonably Practicable
SOP	Standard Operating Procedure
NFPA	National Fire Protection Association

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Executive Summary

The report represents the QRA study carried out for Ammonium Nitrate Handling at EQ-3 and EQ-6 wharf of Visakhapatnam Port Authority (VPA), Andhra Pradesh. The study refers the layout drawing, Ammonium Nitrate Analysis report and other documents. The study team comprises Mr. Pradyut Mitra, experienced Process and safety professional having more than 30 years of experience and Mr. Dipak Sonawane & Mr. Sudarshan Daga, Risk & Safety Experts who has conducted analysis for the study.

A special gratitude goes to Visakhapatnam Port Authority, Andhra Pradesh for sharing the required information.

For the benefit of the implementers, the observations have been identified and highlighted as recommendations. The recommendations can also be designated as Opportunities for improvement and relate to best practices.

This study for the said facility has been carried out based on the data and information provided by the client.

The following accidental scenarios and consequences have been considered for the study:

- A fire on transport vehicle at jetty:
- An Explosion Risk
- Decomposition after the fire and toxic gases release in the environment (NH3, NO, NO2 and CO).

1. Introduction

Visakhapatnam Port Authority receive Ammonium Nitrate (AN) with Fertilizer Grade by ships. Ammonium Nitrate is unloaded on wharf and then transported to destination by the users. Generally, 1.2 tons of Ammonium nitrate in baggage form is unloaded at EQ-3 and EQ-6 wharf and 12-15 bags are packaged in a container at a time. Approx 20 Tons quantity of AN handling is considered for the analysis. The transportation by road will be by closed container or open truck and passing by the port limit to the consignee.

1.1 Objective

The objectives of the Risk Analysis study are to identify and quantify all potential failure modes that may lead to hazardous consequences and extent. Typical hazardous consequences include fire, explosion, and toxic releases.

This is achieved by the following:

- Identification of hazards that could be realized from hazardous material.
- Identify the potential failure scenarios that could occur within the facility.
- To asses, the potential risks associated with identified hazards to which the plant and its personnel and community outside may be subjected. Consequence analysis of various hazards is carried out to determine the vulnerable zones for each probable accident scenario.
- Evaluate the process hazards emanating from the identified potential accident scenarios.
- Analyse the damage effects to the surroundings due to such accidents.
- Conclusion and Recommendations in order to mitigate the hazard.

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1.2 Scope

- The study addresses the hazards that can be realized due to Ammonium Nitrate handling and transport operations at EQ-3 and EQ-6 wharf of Visakhapatnam Port Authority (VPA).

2. Site Condition

2.1 Site Location and vicinity

The layout of EQ-3 and EQ-6 wharf of Visakhapatnam Port Authority (VPA):

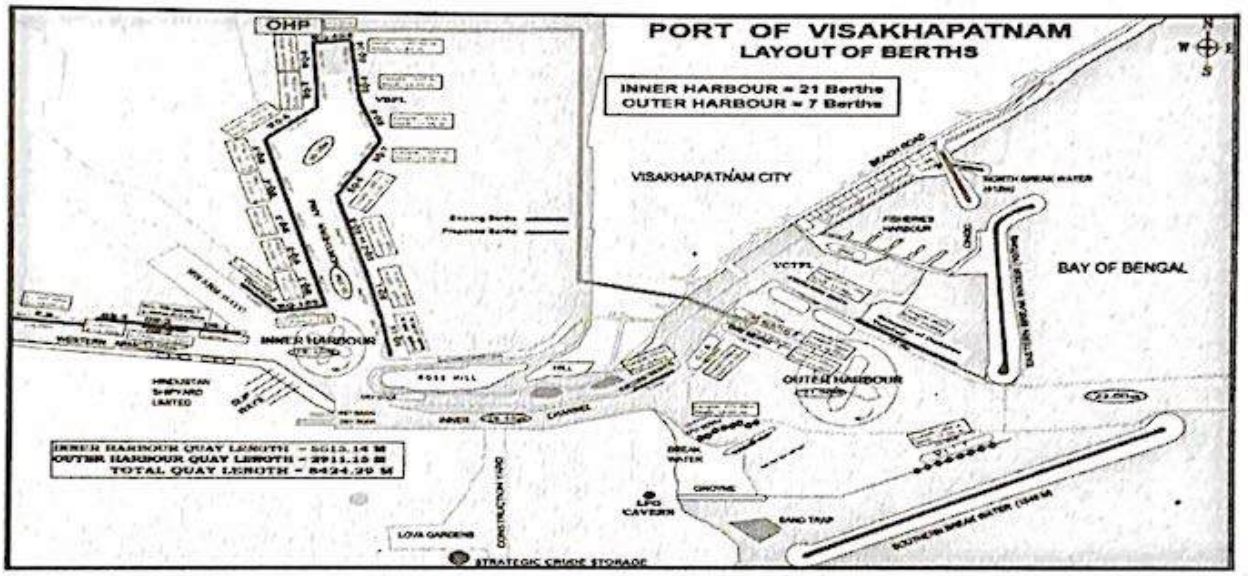


Figure: Layout of Berths, Port of Visakhapatnam

2.2 Material Handling Data:

Ammonium Nitrate (AN) unloaded at EQ-3 and EQ-6 wharf of Visakhapatnam Port Authority (VPA). The cargo handled details provided by port are as below.

Sr. No.	Year	Total vessels	Low avg. tonnage	High avg. tonnage	Total tonnage
1	2021-22	21	1,604	16,029	2,08,761
2	2022-23	18	3,011	22,469	2,70,846
		39	4,615	38,498	4,79,607

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3. Methodology

The consequences of released toxic or flammable material are largely dependent on the prevailing weather conditions. Consequences of loss of containment can lead to hazardous situation in any industry handling potentially hazardous materials. Following factors govern the severity of consequence of the loss of containment.

- Intrinsic properties: flammability, toxicity, and reactivity.
- Dispersive energy: pressure, temperature, and state of matter.
- Quantity present
- Environmental factors: weather (wind speed, wind direction, atmospheric temperature &pressure).

Consequence analysis and calculations are effectively performed by computer software using models validated over several applications. Consequence modeling is carried out by PHAST of DNV Software.

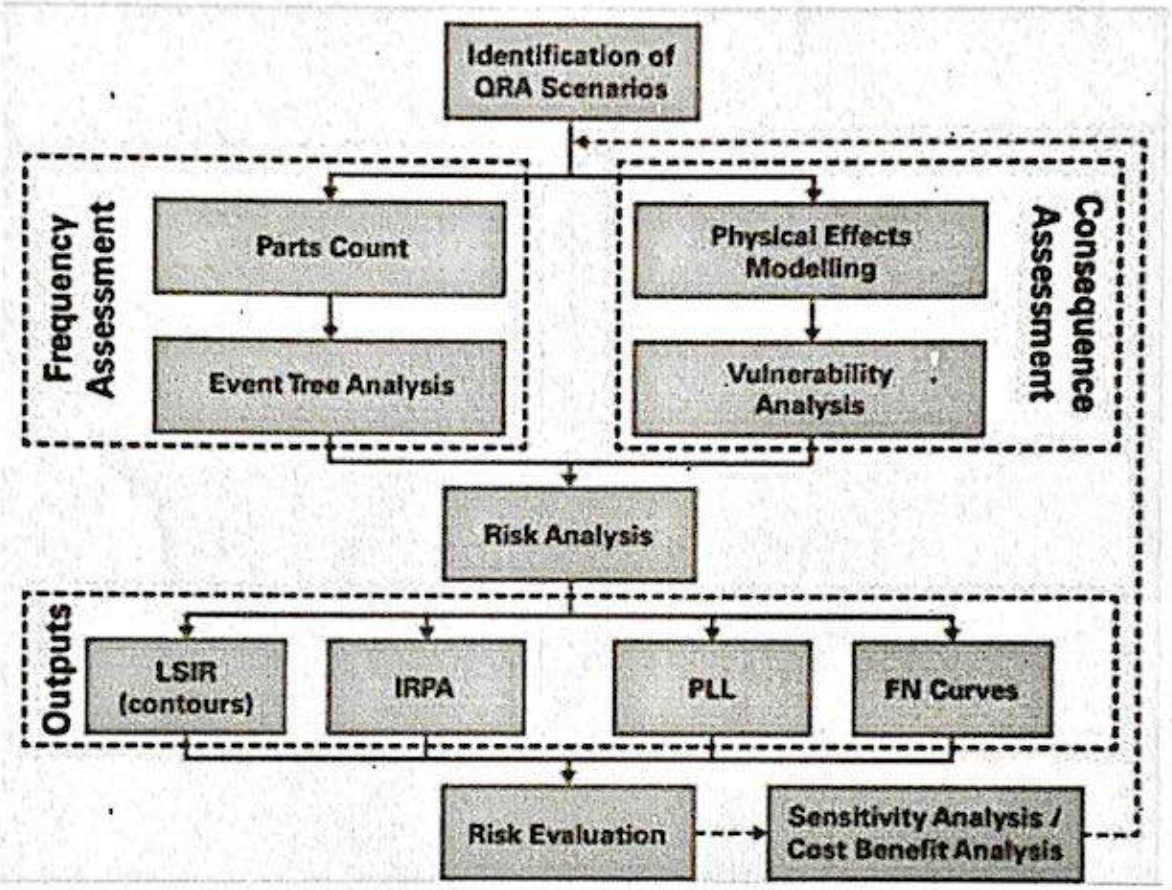
PHAST uses the Unified Dispersion Model (UDM) capable of describing a wide range of types of accidental releases. The Model uses a particularly flexible form, allowing for sharp-edged profiles, which become more diffuse downwind.

PHAST contains data for many chemicals and allows definition of mixtures of any of these chemicals in the required proportion. The calculations by PHAST involve following steps for each modeled failure case:

- Run discharge calculations based on physical conditions.
- Model first stage of release (for weather category).
- Determine gas release after decomposition.
- Dispersion modeling considering weather conditions.

Flow chart for consequence analysis is shown in the form of event tree for release of flammable liquid.

Figure 0-1: Methodology adopted for the study



3.1 Assumptions

1.2 tons of Ammonium nitrate in baggage form is unloaded at EQ-3 and EQ-6 wharf and 12-15 bags are packaged in a container at a time. Approx 20 Tons quantity of AN handling in is considered for the analysis. The transportation by road will be by closed container or open truck and passing by the port limit to the consignee.

There are Two Building Nearby Berth:

Berth EQ-6: Building With 10 People Within 500 M

Berth EQ-3: Building With 20 People Within 100 M

While Unloading, Gang of 12 will be present.

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Atmospheric Parameters

The atmospheric parameters which are considered while conducting this study is as under:

Atmospheric Temperature	27°C
Atmospheric pressure (mmHg)	760
Relative humidity	70%
Solar Radiation flux (KW/m2)	0.7

Wind Speed

It is observed that average wind speed of magnitude of 2-5 m/s blows for majority of the time in a year. Hence predominant wind speed for Visakhapatnam is 2-5 m/s.

Weather Category

One of the most important characteristics of atmosphere is its stability. Stability of atmosphere is its tendency to resist vertical motion or to suppress existing turbulence. This tendency directly influences the ability of atmosphere to disperse pollutants emitted into it from the facilities. In most dispersion scenarios, the relevant atmospheric layer is that nearest to the ground, varying in thickness from a few meters to a few thousand meters. Turbulence induced by buoyancy forces in the atmosphere is closely related to the vertical temperature gradient.

Temperature normally decreases with increasing height in the atmosphere. The rate at which the temperature of air decreases with height is called Environmental Lapse Rate (ELR). It will vary from time to time and from place to place. The atmosphere is said to be stable, neutral, or unstable according to ELR is less than, equal to or greater than Dry Adiabatic Lapse Rate (DALR), which is a constant value of 0.98°C/100 meters.

Pasquill stability parameter, based on Pasquill – Gifford categorization, is such a meteorological parameter, which describes the stability of atmosphere, i.e., the degree of convective turbulence. Pasquill has defined six stability classes ranging from

`A' (extremely unstable) to `F' (moderately stable). Wind speeds, intensity of solar radiation (daytime insulation) and nighttime sky cover have been identified as prime factors defining these stability categories.

Table 0-1: Pasquill stability classes

Stability class	Definition	Stability class	Definition
A	Very Unstable	D	Neutral
B	Unstable	E	Slightly Stable
C	Slightly Unstable	F	Stable

When the atmosphere is unstable and wind speeds are moderate or high or gusty, rapid dispersion of pollutants will occur. Under these conditions, pollutant concentrations in air will be moderate or low and the material will be dispersed rapidly. When the atmosphere is stable and wind speed is low, dispersion of material will be limited and pollutant concentration in air will be high. In general, worst dispersion conditions (i.e. contributing to greater hazard distances) occur during low wind speed and very stable weather conditions.

Stability category for the present study is identified based on the cloud amount and wind speed. For risk analysis the representative average annual weather conditions are assessed based on the following:

Predominant weather stability classes of "F" & "D" are selected with wind speed 2 m/s & 5 m/s respectively for consequence analysis.

Wind Speed (m/s)	Pasquill Stability
2	F
5	D

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The consequence results are reported in tabular form for all the weather conditions and graphs for worst case weather conditions.

3.2 Software Used

DNV PHAST 8.7.1 has been used for consequence analysis include discharge and dispersion calculations.

4. Hazards Associated with Handling Ammonium Nitrate

The release of Ammonium Nitrate can lead to different types of fire or explosion scenarios. These depend on the material released, mechanism of release, temperature and pressure of the material and the point of ignition..Types of flammable effects are as follows.

In this analysis it was assumed that:

- The probability of fatality was 100% at locations where the overpressure would be greater than 42 kPa.
- The probability of fatality was 50% at locations where the overpressure would be between 42 kPa and 21 kPa.
- The probability of fatality was 10% where the overpressure would be between 21 kPa and 3.5 kPa.
- The probability of fatality was zero at locations where the overpressure would be less than 3.5 kPa.
- Distances to the various overpressure levels were then calculated using the standard methodology described above.
- The overpressure vs distance after the calculation of 20 tonnes of Ammonium nitrate for the overpressure criteria are as below.

Sr. No.	Overpressure (kPa)	Prob. of fatality
1	42	100%
2	21	50%
3	3.5	10%

Decomposition after the fire and toxic gases release in the environment (NH3, NO, NO2 and CO).

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When heated to temperatures above 175°C AN starts to decompose. A number of decomposition reactions can take place, the actual balance of which is very sensitive to the particular conditions (e.g. temperature, pressure, degree of confinement, extent of contamination etc.)

4.1 Hazards Associated with Explosive Material

Damage Criteria:

Damage estimates due to overpressure & toxic dispersion have been arrived at by taking in to consideration the published literature on the subject. The consequences can then be visualized by the superimposing the damage effects zones on the proposed plan site and identifying the elements within the project site as well as in the neighboring environment, which might be adversely affected, should one or more hazards materialize in real life.

4.2 Overpressure Damage:

The following tables give effect due to different overpressure on equipment and people.

Table 0-2: Over Pressure Damage Criteria with Damage to People

Over Pressure (mbar)	Mechanical Damage to Equipment	Damage To People
300	Heavy damage to plant & structure	1% death from lung damage >50% eardrum damage >50% serious wounds from flying objects

100	Repairable damage	>1% eardrum damage >1% serious wounds from flying objects
30	Major glass damage	Slight injury from flying glass
10	10% glass damage	No damage

Table 0-3: Over Pressure Damage Criteria with Mechanical Damage to Equipment

Over Pressure		Mechanical damage to Equipment
Bar	K Pa	
0.0014	0.14	Annoying noise (137 dB if of low frequency 10–15 Hz)
0.0021	0.21	Occasional breaking of large glass windows already under strain
0.0028	0.28	Loud noise (143 dB), sonic boom, glass failure
0.0069	0.69	Breakage of small windows under strain
0.0103	1.03	Typical pressure for glass breakage
0.0207	2.07	Safe distance" (probability 0.95 of no serious damage below this value); projectile limit; some damage to house ceilings; 10% window glass broken
0.0276	2.76	Limited minor structural damage
0.03-0.069	3.4-6.9	Large and small windows usually shattered; occasional damage to window frames
0.048	4.8	Minor damage to house structures
0.069	6.9	Partial demolition of houses, made uninhabitable
0.138	13.8	Corrugated asbestos shattered; corrugated steel or aluminum panels, fastenings fail, followed by buckling; wood panels (standard housing) fastenings fail, panels blown in
0.09	9.0	Steel frame of clad building slightly distorted
0.138	13.8	Partial collapse of walls and roofs of houses

Over Pressure Bar	Over Pressure K Pa	Mechanical damage to Equipment
0.207	20.7	Concrete or cinder block walls, not reinforced, shattered
0.158	15.8	Lower limit of serious structural damage
0.172	17.2	50% destruction of brickwork of houses
0.207	20.7	Heavy machines (3000 lb.) in industrial building suffered little damage; steel frame building distorted and pulled away from foundations.
0.207-0.276	20.7-27.6	Frameless, self-framing steel panel building demolished; rupture of oil tanks
0.276	27.6	Cladding of light industrial buildings ruptured
0.345	34.5	Wooden utility poles snapped; tall hydraulic press (40,000 lb) in building slightly damaged
0.345-0.482	34.5-48.2	Nearly complete destruction of houses
0.482	48.2	Loaded, lighter weight (British) train wagons overturned
0.482-0.551	48.2-55.1	Brick panels, 8–12 in. thick, not reinforced, fail by shearing or flexure
0.62	62.0	Loaded train boxcars demolished
0.689	68.9	Probable destruction of buildings; heavy machine tools (7,000 lb) moved and badly damaged, very heavy machine tools (12,000 lb) survive

4.3 COMPOSITION OF AN DECOMPOSITION GASES

The toxic components (CO, NO, NO2, NH3) collectively represent 1.9% by weight (1.5% by volume) of the total mixture. The molecular weight of the mixture is calculated as 24.46 which is lighter than air.

5. Consequence Analysis

The consequence analysis is carried out to determine the extent of spread (dispersion) by accidental release which may lead to fire & explosion resulting in generation of overpressures and toxic dispersion etc.

In order to form an opinion on potentially serious hazardous situations and their consequences, consequence analysis of potential failure scenarios are conducted. It is qualitative analysis of hazards due to various failure scenarios. In consequence analysis, each failure case is considered in isolation and damage effects predicted, without considering the secondary events or failures it may cause, leading to a major disastrous situation. The results of consequence analysis are useful in developing Disaster Management Plan and in developing a sense of awareness among operating and maintenance personnel. It also gives the operating personnel and population living in its vicinity, an understanding of the hazard they are posed to.

5.1 Consequences associated with the handling of Ammonium Nitrate:

5.1.1 An Explosion risks

The HSE have previously advised (Technica, 1990a) that explosion efficiencies applicable to storage of AN for bulk over 2 m pile size as 80%. The TNT mass equivalence of AN is considered as 55%.

The equivalent mass of TNT used as the basis for consequence modelling is as below;

20 Tonnes × 0.8 × 0.55 = 8.8 Te (Tonne's equivalent)

Overpressure vs. Distance Model

Using the efficiency and equivalence factors, a mass of Ammonium Nitrate is equated to a mass of TNT. The distances to defined overpressures of interest are calculated using the 'TNT overpressure vs. scaled distance' relationship. An 'Overpressure vs. Scaled

Distance' relationship can take the form of an equation or graph. In this case an equation is used which is sourced from the US Army [Bulson 1997] and has the form:

$$p_0 = \frac{4120}{Z^3} - \frac{105}{Z^2} + \frac{39.5}{Z}$$

Where, 2 < po < 160 psi gauge

$$Z = \frac{R}{W^{1/3}}$$

and, 3 < Z < 20 ft/lbs1/3

In this analysis it was assumed that:

- The probability of fatality was 100% at locations where the overpressure would be greater than 42 kPa.
- The probability of fatality was 50% at locations where the overpressure would be between 42 kPa and 21 kPa.
- The probability of fatality was 10% where the overpressure would be between 21 kPa and 3.5 kPa.
- The probability of fatality was zero at locations where the overpressure would be less than 3.5 kPa.
- Distances to the various overpressure levels were then calculated using the standard methodology described above.
- The overpressure vs distance after the calculation of 20 tonnes of Ammonium nitrate for the overpressure criteria are as below.

Sr. No.	Overpressure (kPa)	Prob. of fatality	Distance (m)
1	42	100%	88
2	21	50%	130
3	3.5	10%	460

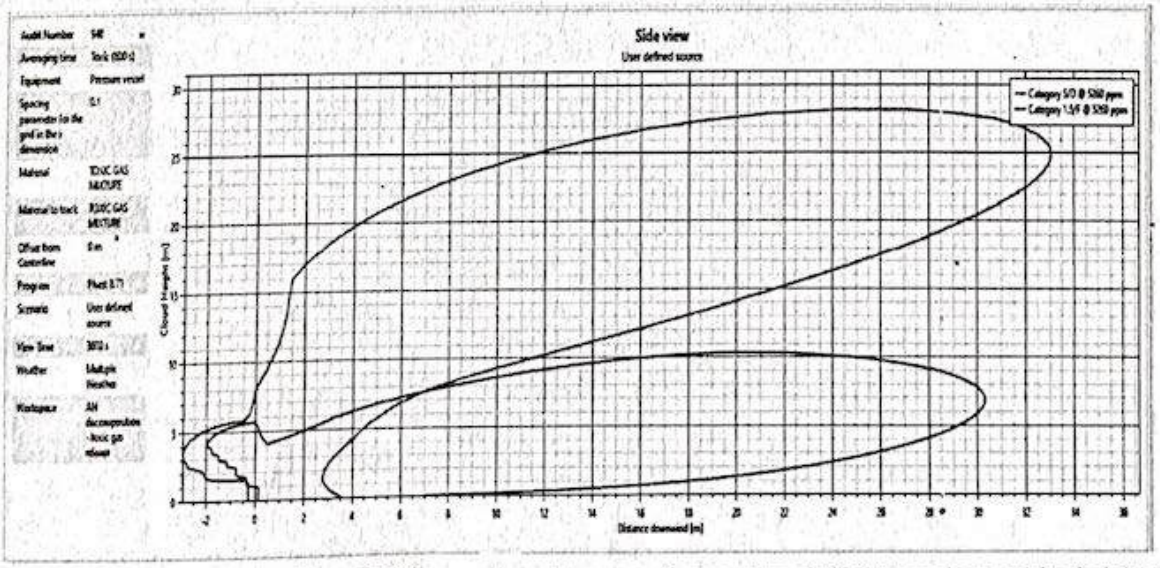
5.1.2 Decomposition after the fire and toxic gases release in the environment (NH3, NO, NO2 and CO).

When heated to temperatures above 175°C AN starts to decompose. A number of decomposition reactions can take place, the actual balance of which is very sensitive to the particular conditions (e.g. temperature, pressure, degree of confinement, extent of contamination etc.)

Decomposition Products:

The toxic components (CO, NO, NO2, NH3) collectively represent 1.9% by weight (1.5% by volume) of the total mixture. The molecular weight of the mixture is calculated as 24.46 which is lighter than air.

The toxic dispersion downwind distance has been determined using the DNV-PHAST software. The toxic dispersion results are shown below for the various wind speed and atmospheric stability conditions (1.5 F and 5 D):



As per above figure the 5260 ppm level conc. is reached till 30 meters at height around 5 meters. The table below shows the downwind distance for the conc. level with height.

A05

Sr. No.	Height of interest (m)	Wind speed	Downwind Distance (m)
1	0	1.5-F	3.59
		5-D	7
2	1	1.5-F	2.8
		5-D	18
3	2	1.5-F	2.9
		5-D	22
4	3	1.5-F	3.3
		5-D	25
5	4	1.5-F	3.8
		5-D	27
6	5	1.5-F	4
		5-D	29

From above table and figure, it is evident that the gas mixture is remained buoyant and the effects are mostly at height above the ground level and in case of 5 m/s wind speed and D stability conditions. So, the 100% fatalities will be in the range of 22 meters for 2 m height conditions.

5.2. Failure frequency for the explosion and decomposition of Ammonium Nitrate:

AN fire on road vehicles:

For AN fire on road vehicles as per the literature the event frequency is as 2×10^{-9} per vehicle-km. For the approximately 10,000 movements (for approximately 2,00,000 Tonnes per year) per year this equates to 2×10^{-5} per km-yr.

AN Explosion During Road Transport:

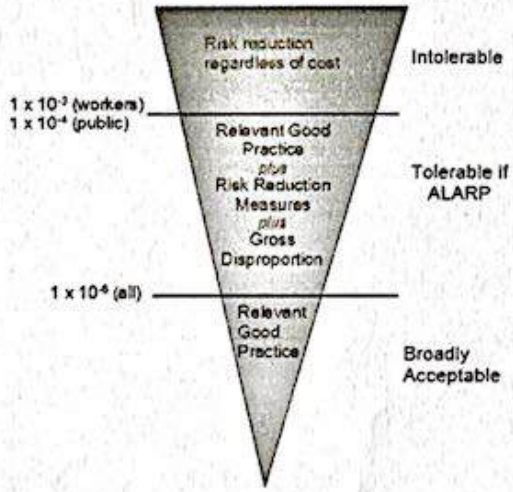
For AN explosion as per the literature the conditional probability of explosion in the event of fire is considered as 10%. The event frequency for AN explosion is therefore calculated as 2×10^{-10} per vehicle-km. For the postulated 10,000 movements (for approximately 2,00,000 Tonnes per year) per year this equates to 2×10^{-6} per km-yr.

5.3 Individual Risk Criteria:

The individual risk contours have been plotted on the below port layout after assessing the consequences and frequency of explosion and decomposition of AN.

Individual risk criteria are often used with the As Low As Reasonably Achievable (ALARP) principle which sets an upper bound below which risk must be reduced (Intolerable level) and a lower bound that is a target that may not be achieved (Broadly acceptable level). The UK HSE has suggested the following values for individual annual fatality risk:

Figure: Individual risk criteria



Intolerable (per year)		Broadly acceptable (per year)	
Workers	Public	Workers	Public
1×10^{-03}	1×10^{-04}	1×10^{-06}	1×10^{-06}

Distance and Individual Risk

Sr. No.	Distance (m)	Individual Risk (per year)
1	30	6.03×10^{-6}
2	100	3.20×10^{-6}
3	130	1.20×10^{-6}
4	450	2.00×10^{-7}

6. Individual Risk Contour

Individual Risk contours are shown in below figures:

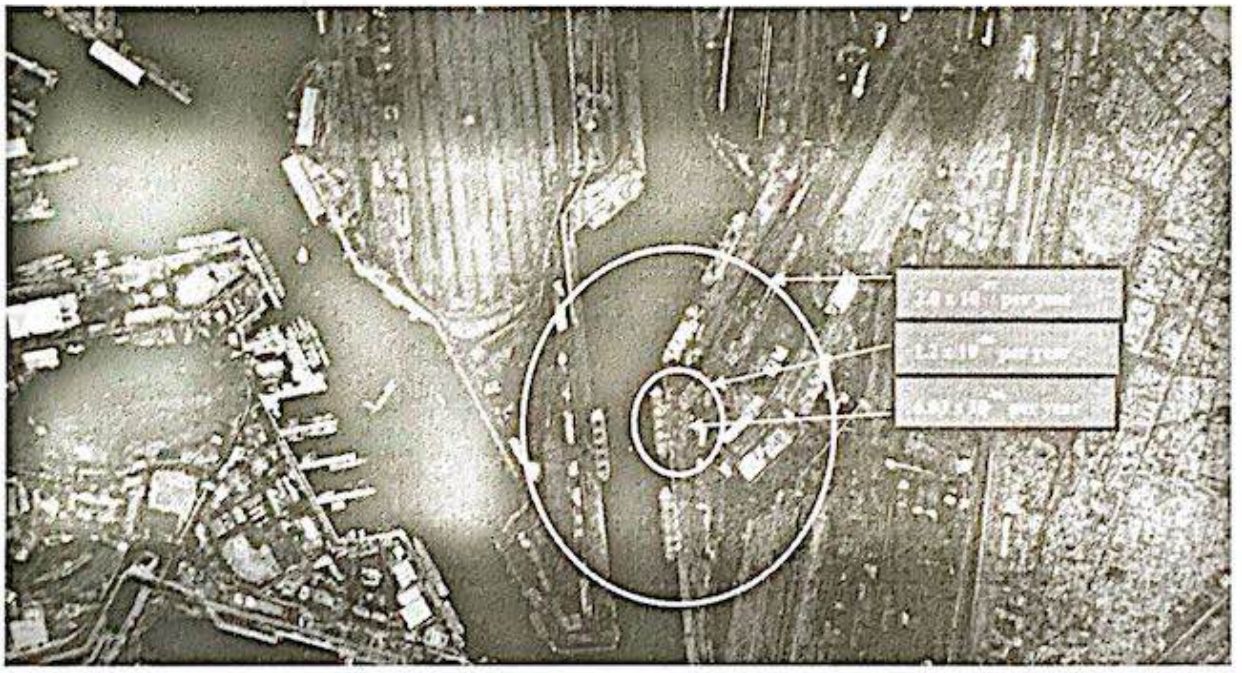


Figure: Individual risk contours for EQ-3 wharf

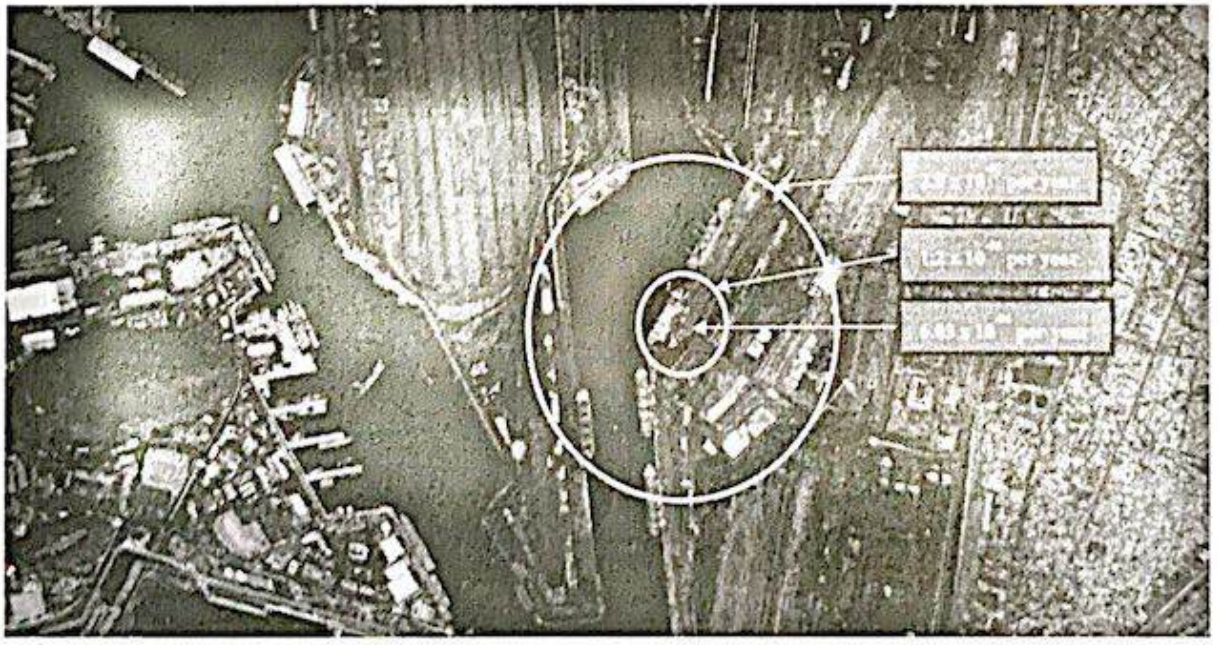


Figure: Individual risk contours for EQ-6 wharf

7. Conclusion

The individual risk contours for the 30 meters from the handling area are 6.03×10^{-6} per year compared to the UK HSE criteria and it is falling in ALARP region.

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8.Recommendations & Mitigation Measures

- Adequate fire-fighting facility as per NFPA 490 (replaced by 400) shall be provided at ammonium nitrate storage and handling premises.
- The Emergency action plan should be in place in case of emergencies arises during the handling of Ammonium nitrate cargo.
- Follow the Standard operating procedure (SOP), 2020 for handling Ammonium Nitrate prepared by VPT traffic department.
- The firefighting arrangements and precautions are mentioned for vessel/ship side fire. but during the unloading operations at EQ-3 and EQ-6 wharf, the firefighting arrangements are not mentioned in SOP. SOP shall be revised to include all the precautionary measure required for handling Ammonium Nitrate.
- Training shall be imparted to all personnel involved in handling Ammonium Nitrate.
- Provision of The Ammonium Nitrate Rules, 2012, amended in 2021 shall be ensured.

9.References

- Data received of Ammonium nitrate from the Vizag port, Vizag.
- Quantitative Risk Assessment report of Bunbury outer harbour for marlston hill, DNV Technica, Jan 1994.
- An estimate of the TNT-Equivalent net explosive quantity (NEQ) of the Beirut port explosion using publicly available tools and data, C. Stennett et. al., Propellants, Explosives, Pyrotechnics, 2020.
- An investigation into the relative risks from the road transport of blasting explosives in maximum loads of 5 tonne and 16 tonne, R. Merrifield, HSE, 1994.
- Hazard and Risk Assessment, Moranbabh Ammonium Nitrate project, Dyno Nobel Asia Pacific limited, October 2006.
- Loss prevention in the process industries, Volume 2, Second edition, Lees, F. P., 1996.
- Guidance on ALARP decisions on COMAH, UK HSE, SPC / Permissioning / 37.

10. Appendix-A: MSDS – Ammonium Nitrate
B: AN Analysis Report

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Chemical type	: Substance
Substance name	: Ammonium nitrate
EC no	: 229-347-8
CAS No.	: 6484-52-2
REACH registration No.	: 01-2119490981-27
IUPAC name	: Ammonium nitrate
Chemical name	: Nitric acid ammonium salt
Formula	: H3N.HNO3

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

1.2.1. Relevant identified uses

Use of the substance/preparation : Adhesives, sealants
Fertilizers
Fuels
Explosives
Intermediates
Water treatment chemicals

1.2.2. Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet

Manufacturer:
Joint-stock company "Kuibyshev Azot"
6, Novozavodskaya, Toliatti, Samara Region
445007 - Russia
T +7 (8482) 561101, 561301 - F +7 (8482) 561301
E-mail: office@kuazot.ru
http://www.kuazot.ru/

Only representative:

ITS Testing Services (UK) Ltd
Caleb Brett House
734 London Road
RM20 3NL - West Thurrock, Grays
Essex, United Kingdom
T +44(0)161 228 0111 - F +44(0)161 933 4001
E-mail: ies14.reach@intertek.com

1.4. Emergency telephone number

Emergency number : +7 (8482) 561101

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Ox. Sol. 3 H272
Eye Irrit. 2 H319

Full text of H-phrases: see section 16.

Classification according to Directive 67/548/EEC or 1999/45/EC

Xi; R36
O; R8

Full text of R-phrases: see section 16.

Adverse physicochemical, human health and environmental effects

No additional information available

2.2. Label elements

Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP) :



GHS03 GHS07

Signal word (CLP) : Warning

Hazard statements (CLP) : H272 - May intensify fire; oxidizer
H319 - Causes serious eye irritation

Precautionary statements (CLP) : P210 - Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P220 - Keep/Store away from clothing/.../combustible materials.
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 minuts. Remove contact lenses, if present and easy to do. Continue rinsing
P370+P378 - In case of fire: Use Water for extinction.

2.3. Other hazards

No additional information available

SECTION 3: Composition/information on ingredients

3.1. Substances

Name	Product identifier	%	Classification according to Directive 67/548/EEC
Ammonium nitrate	(CAS No.) 6484-52-2 (EC no) 229-347-8 (REACH-no) 01-2119490981-27	>= 97	Xi; R36 O; R8

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Ammonium nitrate	(CAS No.) 6484-52-2 (EC no) 229-347-8 (REACH-no) 01-2119490981-27	>= 97	Ox. Sol. 3, H272 Eye Irrit. 2, H319

Full text of R-, H- and EUH-phrases: see section 16.

3.2. Mixtures

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures after inhalation : If respiratory irritation occurs upon inhalation, remove to fresh air. Seek medical attention if symptoms develop or persist. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In all cases of doubt, or when symptoms persist, seek medical advice.

First-aid measures after skin contact : Wash immediately with lots of water (15 minutes)/shower. Remove/Take off immediately all contaminated clothing. Seek medical attention if irritation develops.

First-aid measures after eye contact : Remove contact lenses, if present and easy to do. Continue rinsing. Rinse immediately and thoroughly, pulling the eyelids well away from the eye (15 minutes minimum). Seek medical attention if ill effect or irritation develops.

First-aid measures after ingestion : Seek medical advice. If swallowed, do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth immediately and drink large quantities of water.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries after eye contact : Irritating to eyes.

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

Methaemoglobinaemia.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media: : Non combustible. Water.

Unsuitable extinguishing media : combustible materials.

5.2. Special hazards arising from the substance or mixture

Fire hazard : May be explosive in contact with flammable or organic substances and at confinement during fire. . Hazardous decomposition products: Nitrogen oxides (NOx). Ammonia. amines.

Reactivity : Stable in use and storage conditions as recommended in item 7.

5.3. Advice for firefighters

Precautionary measures fire : Use self-contained breathing apparatus and chemically protective clothing.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Avoid contact with skin, eyes and clothing. Use personal protective equipment as required. For further information refer to section 8 : Exposure-controls/personal protection"".

6.1.1. For non-emergency personnel

No additional information available

6.1.2. For emergency responders

No additional information available

6.2. Environmental precautions

Prevent contamination of soil, drains and surface waters. Do not discharge into drains or the environment. Relevant water authorities should be notified of any large spillage to water course or drain.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up : Sweep or shovel spills into appropriate container for disposal. To clean the floor and all objects contaminated by this material, use plenty of water. Do not absorb with saw-dust or any other combustible absorbent material. Avoid raising powdered materials into airborne dust.

Other information : Avoid generation of dust. Keep away from sources of ignition.

6.4. Reference to other sections

Refer to sections 8 and 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Provide adequate ventilation. Provide local exhaust or general room ventilation to minimize vapour concentrations. Avoid contact with skin, eye and clothing. Avoid generation of dust. Avoid ignition sources. Protect from moisture. Keep away from: Metals. dust. organic materials.

Hygiene measures : Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling. Wash contaminated clothing prior to re-use. Remove all contaminated clothing and footwear.

7.2. Conditions for safe storage, including any incompatibilities

Storage condition(s) : Keep in original containers. Keep container tightly closed in a cool, well-ventilated place. Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Avoid high temperatures. Keep away from : combustible materials. reducing materials.

Incompatible products : combustible materials. reducing materials.

Incompatible materials : copper. Zinc.

Packaging materials : stainless steel. synthetic material.

7.3. Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Occupation exposure limits: No data available.

Biological exposure limits: no data available

DNEL/PNEC

DNEL/DMEL			Exposure routs	Exposure frequency	Critical component	Remark
Worker		Consumer				
Industry	Professional					
N/A	N/A	N/A	Oral	Short term (acute)	N/A	None
N/A	N/A	12.8 mg/kg bw/day		Long term (repeated)		
N/A	N/A	N/A	Dermal	Short term (acute)		
21.3 mg/kg bw/day	N/A	12.8 mg/kg bw/day		Long term (repeated)		
N/A	N/A	N/A	Inhalation	Short term (acute)		
37.6 mg/m³	N/A	11.1 mg/m³		Long term (repeated)		

PNEC aqua (freshwater): 0.45 mg/L
PNEC aqua (marine water): 0.045 mg/L

PNEC aqua (intermittent releases): 4.5 mg/L
PNEC for sewage treatment plant: 18 mg/L
PNEC sediment: not available
PNEC soil: not available
PNEC oral (secondary poisoning): No potential for bioaccumulation

8.2. Exposure controls

Appropriate engineering controls	:	Ensure adequate ventilation. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.
Hand protection	:	protective gloves.
Eye protection	:	Chemical goggles or face shield.
Skin and body protection	:	Wear protective clothing.
Respiratory protection	:	Wear respiratory protection.
Environmental exposure controls	:	Can be disposed as waste water according to local regulation.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	:	Solid
Appearance	:	White granules, Colorless crystalline powder.
Colour	:	transparent. white.
Odour	:	Odourless.
Odour threshold	:	No data available
pH	:	No data available
Melting point	:	169.6-169.7 °C
Solidification point	:	No data available
Boiling point	:	Not applicable. Decomposes before boiling
Flash point	:	Not applicable. The substance is inorganic.
Relat. evapor. rate comp. to butylacetate	:	No data available
Flammability (solid, gas)	:	Non-flammable.
Explosive limits	:	No data available
Vapour pressure	:	Negligible.
Relative vapour density at 20 °C	:	No data availabl e
Relative density	:	1.72 g/cm³
Solubility	:	Water: > 100 g/100ml at 20 °C
Log Pow	:	Not applicable
Self ignition temperature	:	No self-ignition
Decomposition temperature	:	> 210 °C
Viscosity, kinematic	:	not applicable
Viscosity, dynamic	:	not applicable
Explosive properties	:	Non explosive.
Oxidising properties	:	Oxidizing.
Remarks	:	Ammonium nitrate with > 0.2% of combustible substances is classified as an explosive substance.

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

Stable in use and storage conditions as recommended in item 7.

10.2. Chemical stability

Stable in use and storage conditions as recommended in item 7.

10.3. Possibility of hazardous reactions

Decomposes on heating.

10.4. Conditions to avoid

Decomposes on heating. Do not manipulate the product in a confined space.

10.5. Incompatible materials

reducing agents. Strong acids, bases. Metallic powders. combustible materials. zinc. Copper and its alloys. Chlorates. chromates, e.g. potassium chromate, potassium or sodium dichromate.

10.6. Hazardous decomposition products

During a fire: Nitrogen oxides (NOx).

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Not classified

Ammonium nitrate (6484-52-2)	
LD50 oral rat	2950 mg/kg (OECD 401)
LD50 dermal rat	> 5000 mg/kg (OECD 402)
LC50 inhalation rat (mg/l)	> 88.8 mg/l (no guidelines followed)

Skin corrosion/irritation : Not irritating (OECD 401)

Serious eye damage/irritation : Causes serious eye irritation (OECD 405)

Skin sensitisation : Not sensitizing (OECD 405)

Respiratory sensitisation : No data available

Germ cell mutagenicity : Negative (OECD 471, 473, 476)

Carcinogenicity : No carcinogenic effect (OECD 453)

Reproductive toxicity : Not classified

Specific target organ toxicity (single exposure) : Not classified

Specific target organ toxicity (repeated exposure) : Not classified

Ammonium nitrate (6484-52-2)	
NOAEL (oral,rat,25 days)	1500 mg/kg bodyweight/day (OECD 422)
NOAEL (oral,rat,52 weeks)	256 mg/kg bodyweight/day (OECD 453)
NOAEL (inhalation,rat,vapour,2 weeks)	> 185 mg/m³ (OECD412)

Aspiration hazard : Not classified

Remarks : Some tests have been run on read-across substances

SECTION 12: Ecological information

12.1. Toxicity

Ammonium nitrate (6484-52-2)	
LC50 fish	447 mg/l (48 hours)
EC50 Daphnia	490 mg/l (48 hours)
EC50 microorganisms	> 1000 mg/l
NOEC (acute) microorganisms	180 mg/l
ErC50 (algae)	> 1700 mg/l (10 days)
Remarks	Some tests have been run on read-across substances

12.2. Persistence and degradability

Ammonium nitrate (6484-52-2)	
Persistence and degradability	Not applicable to inorganic substances.
Hydrolysis	No hydrolysable group is present, will completely dissociate into ions.

12.3. Bioaccumulative potential

Ammonium nitrate (6484-52-2)	
Log Pow	Not applicable
Bioaccumulative Potential	Low bioaccumulation potential.

12.4. Mobility in soil

Ammonium nitrate (6484-52-2)	
Ecology - soil	Low potential for absorption.

12.5. Results of PBT and vPvB assessment

Ammonium nitrate (6484-52-2)	
Results of PBT assessment	According to Annex XIII of Regulation (EC) No 1907/2006, no PBT and vPvB assessment has been conducted since ammonium nitrate is inorganic.

12.6. Other adverse effects

No additional information available

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste treatment methods : Can be deposited in landfills, sent to an incineration or other appropriate means of disposal provided they meet the requirements of local laws.

Additional information : Empty containers should be thoroughly rinsed with large quantities of clean water. Empty containers can be dumped after cleaning according to local legislation.

SECTION 14: Transport information

In accordance with ADR / RID / ADNR / IMDG / ICAO / IATA

14.1. UN number

UN-No. : 1942

14.2. UN proper shipping name

Proper shipping name : AMMONIUM NITRATE

Transport document description : UN 1942 AMMONIUM NITRATE, 5.1, III, (E)

14.3. Transport hazard class(es)

Class (UN) : 5.1

Hazard labels (UN) : 5.1 - Oxidizer



14.4. Packing group

Packing group (UN) : III

14.5. Environmental hazards

Other information : No supplementary information available.

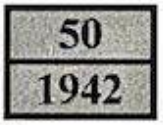
14.6. Special precautions for user

14.6.1. Overland transport

Hazard identification number (Kemler No.) : 50

Classification code : O2

Orange plates :



Tunnel restriction code : E

Limited quantities (ADR) : LQ12

Excepted quantities (ADR) : E1

14.6.2. Transport by sea

Class 5.1 - Oxidizer

14.6.3. Air transport

Class 5.1 - Oxidizer

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable

SECTION 15: Regulatory information

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

15.1.1. EU-Regulations

No additional information available

15.1.2. National regulations

No additional information available

15.2. Chemical safety assessment

CSA has been carried out for this substance.

SECTION 16: Other information

Sources of Key data : MSDS.

Abbreviations and acronyms : ACGIH (American Conference of Governement Industrial Hygienists). ASTM - American Society for Testing and Materials . CAS - Chemical Abstracts Service. CAS (Chemical Abstracts Service) number. CLP - Classification, Labelling and Packaging. CSR - Chemical Safety Report. DIN - Deutsches Institut für Normung eV (German Institute for Standardization). EC - European Community. EEC - European Economic Community. FRP: fiberglass-reinforced plastics. GESTIS: Gefahrstoffdaten banken (Database on hazardous substances). GHS - Globally Harmonised System. GPPS: general purpose polystyrenes. HCS - Hazard Communication Standard. HIPS: high impact polystyrenes. HMIS - Hazardous Materials Identification System. IARC (International Agency for Research on Cancer). MSDS - Material Safety Data Sheet. PVA (Polyvinyl alcohol). OSHA - Occupational Safety and Health Administration. Overland transport (ADR). PVC (Polyvinyl chloride). REACH - Registration, Evaluation, Authorisation and Restriction of Chemicals. SDS - Safety Data Sheet . UP: Unsaturated polyester. VCI - volatile corrosion inhibitor. VE: epoxy vinyl ester.

Full text of R-, H- and EUH-phrases:

Eye Irrit. 2	Serious Eye Damage/Irritation Category 2
Ox. Sol. 3	Oxidising Solid Category 3
H272	May intensify fire; oxidizer
H319	Causes serious eye irritation
R36	Irritating to eyes.
R8	Contact with combustible material may cause fire.

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

2/2023-HQ-Mum

ANNEXURE - 22

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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
"व्यावसायिक सुरक्षा और स्वास्थ्य भवन", एन.एस. मंकीकर मार्ग, सीव, मुंबई - ४०० ०२२, भारत
"Vyavsayik Suraksha aur Swasthya Bhavan", N.S. Mankikar Marg, Sion, Mumbai - 400 022, India.

No. DS-Enf/2/2023-HQ-Mum Date: 10.03.2025

To
The Traffic Manager
Visakhapatnam Port Authority
Visakhapatnam-530035.

Subject: Report on adequacy of safety measures by Visakhapatnam Port Authority at Visakhapatnam port, Visakhapatnam for import and handling of Ammonium Nitrate –Reg.

Ref.: 1) ITRA/SHP/FAMN dated-07.11.2024
2) DS-Enf/2/2023-HQ-Mum dated-18.11.2024
3) ITRA/SHP/FAMN dated-07.01.2025
4) ITRA/SHP/FAMN dated 04.02.2025

Sir,

This has reference to the letters as mentioned above. It is suggested that Visakhapatnam Port Authority (VPA) may directly forward the compliance report to the APPCB for issuance of No-Objection Certificate (NOC) for handling import of ammonium nitrate (fertilizer grade) vessels.

Further, it is informed that the decision to issue the NOC does not fall under the purview of CIDS, DGFASLI.

This is issued with the approval of the Chief Inspector of Dock Safety.

Regards,

Signed by Vipul Kumar Mishra
Date: 10-03-2025 14:16:51

(Vipul Kumar Mishra)
Director (Safety)&
In-Charge Dock Safety

ANNEXURE-23

G20 भारत 2023 INDIA
वसुधैव कुटुम्बकम्
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विशाखपट्टणम पोर्ट प्राधिकरण
(पत्तन, पोत परिवहन और जलमार्ग मंत्रालय)
VISAKHAPATNAM PORT AUTHORITY
(Ministry of Ports, Shipping and Waterways, Govt. of India)
వి-శాఖపట్నం పోర్ట్ అథారిటీ
(ఓడరేవులు, నౌకాయానము మరియు జలరవాణా మంత్రిత్వశాఖ, భారత ప్రభుత్వం)

TRAFFIC DEPARTMENT
No.ITRA/SHP/AMN
Dt. 18-03-2025

To
The Member Secretary,
Andhra Pradesh Pollution control Board,
Dr.YSR Paryavaran Bhavan,
APIIC Colony Road, Gurunanak Colony,
Auto Nagar, Vijayawada.

Sir,

Sub: Request for relaxation in the restrictions imposed by the Govt. of Andhra Pradesh and APPCB on importing of Ammonium Nitrate through the Visakhapatnam Port – Expeditious action Requested.-Reg.

Ref: 1. E.F.S.&T Dept Memo No: EFS01-ENVOPEST(CPRO)/22/2020-SEC-I dated: 06-01-2023 addressed to APPCB and copied to Chairman, VPA and others.
2. E.F.S.&T Dept Lr No: EFS01-ENVOPEST(CPRO)/22/2020-SEC-I-1, dated: 10-08-2023 addressed to MoPSW and copied to APPCB and Chairman, VPA and others
3. APPCB Lr No: 724/APPCB/HO/ECS/TF/VSP/2023, Dt:12.08.2023.
4. VPA Lr No: ITRA/SHP/FAMN/2290, Dt: 23-08-2023 addressed to Member Secretary, APPCB and copied to Special Secretary, E.F.S & T Dept and others.
5. E.F.S.&T Dept Lr No: EFS01-ENVOPEST(CPRO)/22/2020-SEC-I, dated: 15-09-2023 addressed to MoPSW and copied to Chairman, VPA and others.
6. E.F.S.&T Dept Lr No: EFS01-ENVOPEST(CPRO)/22/2020-SEC-I, dated: 12-10-2023 addressed to Chairman/VPA and copied to MoPSW and others.
7. VPA Lr No: ITRA/SHP/FAMN/6059, Dt: 06-11-2023 addressed to the Special Secretary to Government, E.F.S&T Dept and copied to others.
8. Ministry of Ports, Shipping and Waterways Lr. No.F.No.PD- 19017/7/2022-PD -V/III, Dt.29.11.2023 addressed to the Special Secretary to Government, E.F.S&T Dept and copied to Chairperson / VPA.
9. VPA Lr No: ITRA/SHP/FAMN/9041, Dt: 12-12-2023 addressed to the Special Secretary to Government, E.F.S&T Dept and copied to others.
10. VPA Lr No: ITRA/SHP/FAMN/935, Dt: 13-03-2024 addressed to the Special Secretary to Government, E.F.S&T Dept and copied to others.
11. VPA Lr No: ITRA/SHP/FAMN/2449, Dt: 12/15-05-2024 addressed to the Special Secretary to Government, E.F.S&T Dept and copied to others
12. Member Secretary, APPCB Lr.No.724/APPCB/HO/ECS/EFS&T/2024 dated 25-06-2024
13. VPA Lr No: ITRA/SHP/FAMN/113, Dt: 03-07-2024 addressed to the Member Secretary to the APPCB and copied to others
14. Member Secretary, APPCB Lr.No.724/APPCB/HO/ECS/EFS&T/2024 dated 02-07-2024.
15. Member Secretary, APPCB Lr.No.724/APPCB/HO/ECS/EFS&T/2024-271 dated 14-08-2024 addressed to DGFASLI and copied to Chairperson /VPA and others.
16. Member Secretary, APPCB Lr.No.724/APPCB/HO/ECS/EFS&T/2024-272 dated 14-08-24
17. Member Secretary, APPCB Lr.No.724/APPCB/HO/ECS/EFS&T/2024 dt. 25-09-24.

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ISO 9001 : 2015, ISO 14001 : 2015 & ISO - 45001 : 2018

18. VPA Lr No: ITRA/SHP/FAMN/1410, Dt: 07-11-2024 addressed to the CIDS.
19. Special Chief Secretary to Govt. of AP Lr.No.efso1-ENVOPEST (CPRO) 22/2020 -SEC-I dt. 03-11-24
20. Director (Sfety) Dock Safety Division Lr.No.DS-Enf/2/2023-HQ-Mum dt. 18-11-2024
21. VPA Lr No: ITRA/SHP/FAMN/158, Dt: 07/08-01-2025 addressed to the Director (Safety) Dock Safety Division copied to Special Chief Secretary, E.F.S.&T Dept. Govt. of AP
22. VPA Lr No: ITRA/SHP/FAMN/401, Dt: 04/05-02-2025 addressed to the Director (Safety) Dock Safety Division copied to Chairman, APPCB and Special Chief Secretary, E.F.S.&T Dept. Govt. of Andhra Pradesh.
23. VPA Lr No: ITRA/SHP/FAMN/701, Dt: 04-02-2025 addressed to the Member Secretary, APPCB and copied to DGFASLI.
24. DGFASLI Lr No.DS-Ent/2/20213 hq-Mum dated 10-03-2025

Please refer to the above prime correspondence exchanged on the subject issue.

Vide reference 15th cited, APPCB had requested Director General, DGFASLI to arrange to furnish detailed report on adequacy of the safety measures being adopted by VPA while handling Ammonium Nitrate through Visakhapatnam Port and also requested the Chairperson/VPA to pursue the matter with Director General, DGFASLI vide reference 16th cited.

In this regard, vide reference 18th, 21st & 22nd cited, remarks of VPA on the points raised by DGFASLI on the report dated 09-09-2024 on adequacy of safety measures taken by VPA for import Ammonium Nitrate was communicated to DGFASLI and requested to forward the same to APPCB so as to enable them to issue NOC to VPA for handling import Ammonium Nitrate (Fertilizer Grade).(copy enclosed).

In response, DGFASLI vide reference 24th cited(copy enclosed), suggested that the Visakhapatnam Port Authority(VPA) may directly forward the compliance report to the APPCB for issuance of No Objection Certificate (NOC) for handling import of Ammonium Nitrate (fertilizer grade) vessels since the decision to issue the NOC does not fall under the purview of CIDS, DGFASLI.

In view of the DGFASLI for favorable remarks for handling Ammonium Nitrate at VPA communicated vide reference 24th cited, it is once again requested that the relaxation in the restrictions imposed by the Government of Andhra Pradesh and APPCB in import and handling of Ammonium Nitrate may be considered for a further period beyond 05-01-2024, so as to continuously handle the consignments of Ammonium Nitrate at VPA, and also to ensure provisions of job opportunities to the people of Andhra Pradesh, apart from work provisions to the other States, involved in handling Ammonium Nitrate (Fertilizer Grade) besides earning tax revenue to the State of Andhra Pradesh

Yours Sincerely,

13/03/2025

For CHAIRPERSON
(G.RAMSEKHAR YAAJI)
TRAFFIC MANAGER i/c
Mobile: 9848019325

o/c

Copy to The Chairman, APPCB for information

o/c

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E-mail : tm.brsr.vpt@gov.in

प्रेषित किया गया
DESPATCHED

Approved placed below for sign plase

13/3/25

13/3/25

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Coy to The District Collector, Visakhapatnam District, Visakhapatnam for information
Copy to The Commissioner of Police, Visakhapatnam City, for information
Copy to JCEE, APPCB, ZO Visakhapatnam for information

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BEFORE THE NATIONAL GREEN TRIBUNAL, SOUTHERN REGION-CHENNAI.

O.A.NO. 253 OF 2024

IN THE MATTER OF:

Sri Chaitanya Sravanthi Applicant

Vs

Visakhapatnam Port Authority 9th Respondent.

TYPE SET OF DOCUEMTNS FILED BY THE 9th RESPONDENT

M.R.DHARANI CHANDER
COUNSEL FOR 9TH RESPONDENT