BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL
SOUTHERN ZONE, CHENNAI.
Original Application No. 195 of 2023

Tribunal on its own motion – SUO MOTU based on the News item published on27.12.2023 regarding "Ammonia gas leak from fertiliser manufacturing unit triggers panic in Chennai's Ennore**"**

Vs

1. The Principal Secretary to Govt.of Tamil Nadu,
   Health and Family Welfare Department,
   Govt. Secretariat, Fort St.George,
   Chennai – 600 009.
   & 6 Others

....Respondents

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Advocate for Respondent: TNPCB
Thiru.S. Sai Sathya Jith,
Advocate, Chennai.

BEFORE THE NATIONAL GREEN TRIBUNAL
SOUTHERN ZONE, AT CHENNAI
O A No. 195 of 2023

Tribunal on its own motion – SUO MOTU based on the News item published on27.12.2023 regarding "Ammonia gas leak from fertiliser manufacturing unit triggers panic in Chennai's Ennore"

-VS-

1. The Principal Secretary to Govt.of Tamil Nadu,
   Health and Family Welfare Department,
   Govt. Secretariat, Fort St.George, Chennai – 600009.

2. The Principal Secretary to Govt.of Tamil Nadu,
   Department of Environment, Climate Change& Forests,
   Chennai – 600009.

3. The Chairman,
   Tamil Nadu Pollution Control Board,
   No:76, Anna Salai, Guindy,Chennai – 600032.

4. The District Collector,
   Chennai District,
   District Collectorate Office,
   No:62, Rajaji Salai, 4thFloor, Chennai – 600 001

5. Tamil Nadu Coastal Zone Management Authority,
   rep. by its Member Secretary,
   No:1, Jeenis Road, Panagal Building,
   Ground Floor, Said pet,Chennai – 600 015.

6. The Chief Inspector of Factories,
   Office of the Chief Inspector of Factories,
   Chepauk, Chennai – 600 005.

7. Coromandel International Limited,
   rep. by its Authorized Signatory,
   Post Box No.2, Ennore Express Highway Road,
   Ennore, Chennai – 600 057.

....Respondents

REPORT FILED ON BEHALF OF 3RDRESPONDENT – TAMIL NADU POLLUTION CONTROL BOARD

I, S.Ragupathi, Son of Sanganan, aged about 59 years having office at No.76, Mount Salai, Guindy, Chennai 600 032, do hereby solemnly affirm and sincerely state as follows:

05.02.24
JOINT CHIEF ENVIRONMENTAL ENGINEER
TAMIL NADU POLLUTION CONTROL BOARD
No.76, MOUNT SALAI, GUINDY

1) I am the Joint Chief Environmental Engineer, Tamil Nadu Pollution Control Board, Chennai – 600 032. I am filing this report on behalf of the 3rd respondent, TNPCB duly authorized and approved by the Chairperson, TNPCB and as such I am well acquainted with the facts of the case from the records available in this office.

2) It is respectfully submitted that the Hon'ble National Green Tribunal (SZ), Chennai had registered as a Suo Motu case, the issue based on the News published on 27.12.2023 as "Ammonia gas leak from fertiliser manufacturing unit triggers panic in Chennai's Ennore".On 8.1.2024, the Hon'ble Tribunal directed all the respondents to file their respective reports. The Inspector Dock Safety has been impleaded as 11th respondent with the direction to make a preliminary inspection and to file a detailed report regarding the leakage of Ammonia Gas.

3) It is respectfully submitted that a phone message was received by JCEE (M), TNPCB, Chennai from the unit of M/s Coromandel International Ltd., at 12.45 AM on 27.12.2023 regarding ammonia gas leakage occurred during pre-cooling operation of pipeline. Immediately Tamil Nadu Pollution Control Board (TNPCB) officials, JCEE (M) Chennai along with DEE (Ambattur) and AEE (Manali) reached the site by 2.15 AM. They inspected the unit and pipeline locations. The Joint Director, of the 6th respondent who is the authority for safety of industrial operation was also present at the site. During inspection by TNPCB officials, the unit has reported the following:

i. Pressure drop was observed in pipeline at around 11.30 PM on 26.12.2023 and pungent ammonia odour near the material gate.
ii. The duty officer of the unit also visited the pipeline location across the road and observed that the sea water around the pipeline at about 2 feet from shore was white in colour.
iii. The unit immediately started depressurizing the pipeline and completed the entire operation by 12.30AM on 27.12.2023.

05.02.24

JOINT CHIEF ENVIRONMENTAL ENGINEER
TAMIL NADU POLLUTION CONTROL BOARD
No.76, MOUNT SALAI, GUINDY,
CHENNAI-600 032.

iv. The wind direction during accident was observed to be West Southwest in which direction villages such as Periakuppam and Chinnakuppam are located.

v. They monitored ammonia level in ambient air near material gate using a handheld monitor and found that ammonia level was 28ppm during accident (as against standard 24 hr average concentration of 0.57ppm).

vi. The unit also received information from local Assistant Commissioner of Police regarding complaints received from public on ammonia odour from Periakuppam, Chinnakuppam and a few other villages. Police and District Administration along with the unit arranged ambulances and public transport for managing any emergency situation. A few people from above villages also received first aid due to eye irritation and breathing difficulties.

4) It is respectfully submitted that immediately after inspection of the unit by field officials, TNPCB issued directions vide Proceeding No.T1/TNPCB/F.0101AMB/RL/AMB/W&A/2023 dated 27.12.2023, under Section 33A of the Water (P&CP) Act, 1974 as amended and Section 31A of the Air (P&CP) Act, 1981 as amended to the unit to carry out the following:

i. The unit shall suspend operation of Ammonia offshore pipeline activity for pre-cooling and ammonia transfer immediately and shall resume the same only after obtaining approval of Indian Register of Shipping (IRS) and the Tamil Nadu Martine Board.

ii. The unit shall precisely identify the location and extent of damage that happened to offshore pipeline and rectify the same at the earliest.

iii. The unit shall ensure that no ammonia leak occurs during pipeline rectification operation.

iv. The unit shall restart Ammonium Phosphate Potash Sulphate (APPS) plant and other allied units only after ensuring that all ammonia pipeline inside the plant are intact and safe and shall obtain NOC from Director of Industrial Safety and Health (DISH) before restarting the plant.

05/02/24

JOINT CHIEF ENVIRONMENTAL ENGINEER
TAMIL NADU POLLUTION CONTROL BOARD
No.76, MOUNT SALAI, GUINDY,

5) It is respectfully submitted that immediately after the incident the Government have directed the TNPCB to form a technical committee to ascertain the cause of ammonia leak and to furnish a detailed report of the event. Based on that the TNPCB vide Proceeding dated 27.12.2023 has constituted a Technical Committee with following experts and officials.

6) It is respectfully submitted that the Technical Committee has inspected the unit and ammonia pipeline leakage site on 27.12.2023 and 30.12.2023. After the site inspection and detailed deliberations, the Committee has submitted its report. The report is given in Annexure. The committee has made the following recommendations.

i. The unit shall replace the existing offshore pipeline by a new pipeline with the state-of-the-art monitoring, automatic control and accident prevention system.

ii. The pipeline is not properly protected at the location where it emerges out of sea water and crosses the road to reach the plant. It has to be properly secured and made not easily reachable to avoid any accidental damage

iii. Before every pre-cooling and ammonia transfer operation, the unit shall carry out a mandatory pressure test using nitrogen gas to check the integrity of the pipeline. Only after ensuring that the pipeline is intact and safe, should any ammonia be transferred to the pipeline.

iv. The unit shall provide adequate number of ammonia sensors all around the plant near the pipeline where it crosses the Express Highway and in the villages around the plant so as to detect the ammonia in the ambient air at all wind directions and to provide early warning to the public in case of ammonia leak. The unit shall also carry out onsite and off-site emergency preparedness studies by credible agency for both Ammonium Phosphate Potash Sulphate (APPS) and ammonia storage along with off-shore pipeline facility.

v. The unit shall ensure that any ammonia vapour let out of the storage through the pressure relief valve line or through the boil off

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JOINT CHIEF ENVIRONMENTAL ENGINEER
TAMIL NADU POLLUTION CONTROL BOARD
No.76, MOUNT SALAI, GUINDY,
CHENNAI-600 032.

compressor line is sent only through the flare and not directly vented to the atmosphere.

vi. The unit shall install water curtain system, fire water nozzle operated by motor in ammonia feed pumps to reduce the impact of ammonia leakage.

vii. The unit shall explore an option of automatic tripping system during pressure built up, leaks etc., in the pipeline.

viii. The unit shall provide necessary arrangements including high volume sirens to alert the people of the nearby villages during accidents and abnormal operations of the plant.

ix. The unit shall conduct capacity building campaigns for the public of all the nearby villages on the Dos and Don'ts during emergencies including the emergency evacuation procedures.

x. The unit shall keep the people of all the villages located around the plant informed of the pre-cooling and ammonia transfer operations and the Dos and Don'ts in case ammonia odour is sensed by the people and also organise mock drills based on off-site plan organised by the District Administration and Directorate of Industrial Safety & Health (DISH).

xi. The unit shall monitor ambient ammonia level every hour at the offshore pipeline at the shore point, at the mooring point and at the villages located within 2 km from the plant in the prevailing down wind and upwind directions during the pre-cooling and unloading operations and communicate the consolidated report to DISH and TNPCB.

xii. The unit shall monitor the ammonia concentration in the sea water on daily basis near the offshore pipeline at shore point, at mooring point and at a few locations in between the shore and mooring point during the pre-cooling and unloading operations.

xiii. The unit shall make the safety audit report of the offshore pipeline and the fertiliser plant that are carried out periodically by the credible

05.02.24
JOINT CHIEF ENVIRONMENTAL ENGINEER
TAMIL NADU POLLUTION CONTROL BOARD

agency and make it available to public by publishing the same in their website.

xiv. The unit shall upgrade the present semiautomatic control system to a fully automatic control system with interlock facility at all necessary points in the entire plant operations including Ammonia plant and ammonia unloading pipeline operations.

xv. The unit shall carryout safety audit of the ammonia storage tank, all other hazardous chemical storage tanks, and all hazardous chemical pipelines prior to restarting of the Ammonium Phosphate Potash Sulphate (APPS) plant by engaging a credible agency.

xvi. The unit shall carryout risk assessment and Hazard and Operability (HAZOP) study of offshore ammonia pipeline and the fertiliser plant through CSIR-CLRI or by any other credible agency periodically and place all the necessary system and preparedness in place as per the recommendations of the study.

xvii. The unit shall conduct comprehensive safety and hazard audit, identify non- compliances and take corrective measures for identified non-compliances. Emergency plans shall be established to deal with leakages.

xviii. The unit shall provide and make mandatory essential Personnel protective equipment (PPE) like nose mask, Helmets, Safety Shoes, Safety Glasses, chemical Proof Gloves, chemical proof body suit/clothing, self-contained breathing apparatus to all its employees.

xix. The TNPCB shall take immediate action to direct the unit to pay the environmental compensation of Rs.5.92 Crores to TNPCB for environmental mitigation.

xx. The TNPCB shall take legal action against the unit for the non-compliance with the conditions of the consent order issued under the Air Act.

7) It is respectfully that, the Board has forwarded the Technical Committee report to the Government vide Letter dated 11.01.2024. In this

JOINT CHIEF ENVIRONMENTAL ENGINEER
TAMIL NADU POLLUTION CONTROL BOARD
No.76, MOUNT SALAI, GUINDY,
CHENNAI-600 032.

regard, the Government vide Letter No. 6390662/EC.4/2023-3, Dt:02.02.2024 has accepted all recommendations of the Technical Committee and directed the TNPCB to implement all recommendations of the Technical Committee and report compliance. As per the direction of the Government, the TNPCB shall issue direction to the unit to comply with the above recommendation of the Technical Committee.

8) It is submitted that the above is submitted to this Hon'ble Tribunal to appraise of the circumstances as recorded by the officials about the incident and the follow up and further action taken against the unit. It is submitted that pursuant to the recommendation of the Committee and the direction of the Government, further statutory actions are being taken against the unit and thus all such information leading upto those actions and evidences are under review for finalisation.

9) It is submitted that immediate steps to remedy the situation has been done on the field at the earliest possible time and necessary action is being taken as per law to address the incident and the violations as observed. It is prayed that this Hon'ble Tribunal may kindly record and take the above report on the file of this Hon'ble Tribunal.

Under the above circumstances, it is humbly prayed that this Hon'ble National Green Tribunal may be pleased to pass such further or other orders as this Hon'ble Tribunal may deem fit and proper in the facts and circumstance of this case and thus render justice.

05.02.24

JOINT CHIEF ENVIRONMENTAL ENGINEER
TAMIL NADU POLLUTION CONTROL BOARD
No.76, MOUNT SALAI, GUINDY,
CHENNAI-600 032.

VERIFICATION

I, S.Ragupathi, Son of Sanganan, aged about 59 years having office at No.76, Mount Salai, Guindy, Chennai – 600 032 do hereby submit that the contents of the above report are true to the best of my knowledge through records.

05.02.24

JOINT CHIEF ENVIRONMENTAL ENGINEER
TAMIL NADU POLLUTION CONTROL BOARD
No.76, MOUNT SALAI, GUINDY,

Annexure - I

TAMIL NADU POLLUTION CONTROL BOARD

Proc.No.T1/TNPCB/RL/F.0101/AMB/2023, dated : 27.12.2023

Sub: TNPCB – Industries – ammonia gas leakage happened during the pre-cooling operation of the pipeline of M/s. Coromandel International Limited, S.F.No.37/B2, 38/5A, 39/B1, 39/6A, 246/2, 3, 4, 5, 6, 7, 247/(part)1A, 2A, 3C, 3A, Ernavoor village, Thiruvottiyur Taluk and Chennai District - Team constituted – to inspect the unit and to furnish detailed report – reg.

Ref: Ammonia Gas leakage reported by JCEE(M), TNPCB, Chennai

****

A message was received from the unit at 12.45 am on 27.12.2023 regarding the ammonia gas leakage happened during the pre-cooling operation of the pipeline of M/s Coromandel International Ltd., Ennore. Immediately the JCEE (M) Chennai along with DEE (Ambattur) and AEE (Manali) reached the site by 2.15 am and inspected the unit and the pipeline locations. The Joint Director, DISH who is the authority for the safety of the industrial operation was also present at the site.

During inspection, the unit has informed that they will identify the exact location and the extent of pipeline damage within a day and will rectify the same before commencing the ammonia transfer. The unit has been instructed to carryout the above activity at war footing and to put the pipeline in operation only with the concurrence of competent authority i.e., Tamil Nadu Maritime Board.

In this regard, the TNPC Board has decided to constitute a technical committee with the following officials to inspect the unit on 27.12.2023 and to furnish the detailed report on the ammonia gas leakage occurred at M/s. Coromandel International Limited.

S.No.	Name of the officials	Designation & Department
1.	Thiru.R.Kannan	Member Secretary, TNPCB
2	A representative from CPCB, Regional Office, Chennai	CPCB, Regional Office, Chennai
3	Dr. Shankar Narasimhan	Professor, Chemical Engineering, IITM, Chennai
4	Dr. S.V. Srinivasan	Scientist, CLRI
5	Dr. C. Saravanan	Principal Scientist, NEERI
6	Thiru. Karthikeyan	Joint Director, DISH
7	Dr. D. Vasudevan	Joint Chief Environmental Engineer, TNPCB Chennai Zone

The receipt of the proceedings shall be acknowledged.

27.12.23

27/12/2023

For Chairperson

No. 76, MOUNT SALAI, GUINDY, CHENNAI - 600 032.
Tel : 044-22353134 - 139 Fax : 044-22353068
Email : tnpcb-chn@gov.in Web : tnpcb.gov.in

To

1. Thiru.R.Kannan,
   Member Secretary,
   Tamil Nadu Pollution Control Board
2. Official of Regional Office Chennai,
   CPCB, Southern Region, Chennai
3. Dr. Shankar Narasimhan,
   Professor, Chemical Engineering, IITM, Chennai
4. Dr. S.V. Srinivasan,
   Scientist, CLRI
5. Dr. C. Saravanan,
   Principal Scientist, NEERI
6. Thiru. Karthikeyan,
   Joint Director, DISH
7. Dr. D. Vasudevan,
   Joint Chief Environmental Engineer, TNPCB Chennai Zone

Copy to

1. PS to Chairperson, TNPCB, Chennai
2. PA to Member Secretary, TNPCB, Chennai
3. Joint Chief Environmental Engineer, (M), TNPCB, Chennai
4. District Environmental Engineer, Ambattur – for logistics support for the team for visit

TAMIL NADU POLLUTION CONTROL BOARD

Report of the Technical Committee on the ammonia gas leak that occurred in M/s Coromandel International Limited, Ennore on 26.12.2023 at 11.30 pm.

January 2024

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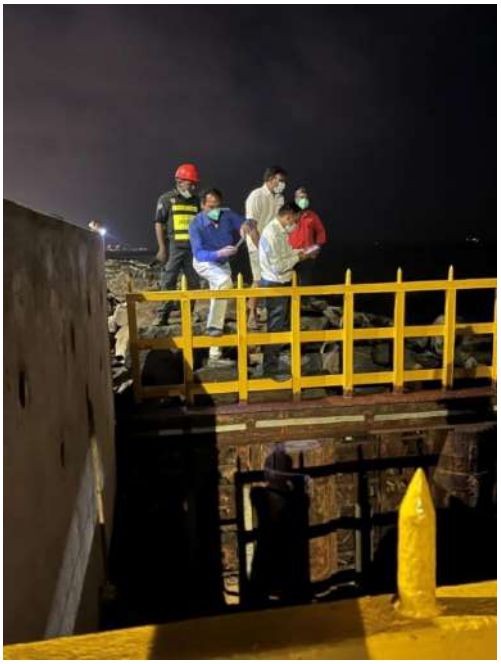
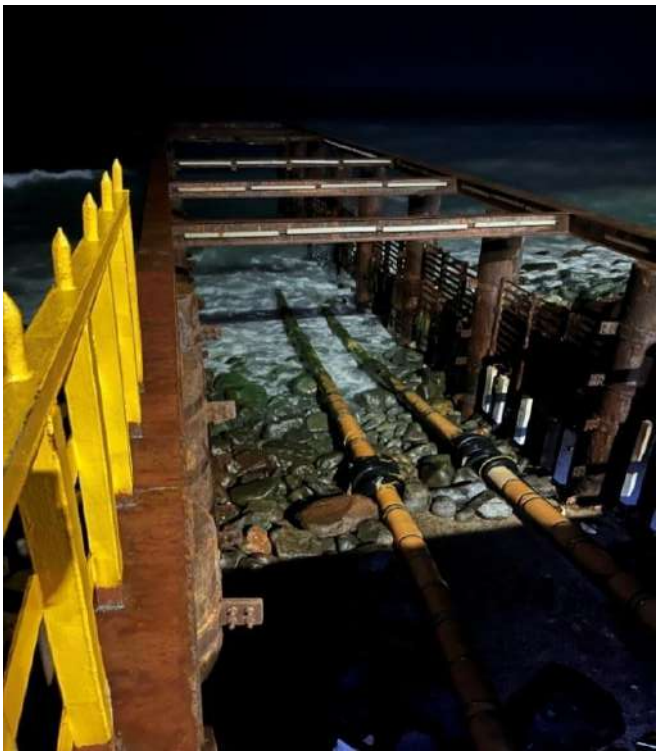
Report of the Technical Committee on the ammonia gas leak that occurred in M/s Coromandel International Limited, Ennore on 26.12.2023 at 11.30 pm.

1. Preamble

The unit of M/s Coromandel International Ltd., Ennore is a fertilizer manufacturing facility and involved in the manufacture of Ammonium Phosphate PotashSulphate (APPS) -4 lakhsTons/Annum. Ammonia is one of the raw materials used for the manufacture of APPS. The capacity of the double insulated ammonium storage tank provided by the unit is 12500 T. The unit has obtained separate Consent to Operate from TNPCB for APPS manufacturing and Ammonia storage terminal.A message was received from the unit by the TNPCB officials at 12.45 am on 27.12.2023 regarding the ammonia gas leakage that happened during the pre-cooling operation of the offshore pipeline. Immediately the Joint Chief Environmental Engineer (M) Chennai along with District Environmental Engineer(Ambattur) and Assistant Environmental Engineer (Manali) reached the site by 2.15 am and inspected the unit and the pipeline locations. The Joint Director, Directorate of Industrial Safety and Health (DISH) who is the authority for the safety of the industrial operation was also present at the site.



TNPCB officials inspecting the ammonia gas transportation pipeline in seashore on 27.12.2023 early hours



Liquid ammonia transportation pipeline in the seashore

The unit informed the following to the TNPCB officials during the discussions held on 27/12/2023:

1) They observed pressure drop in the pipeline at around 11.30 pmon 26/12/2023 and pungent ammonia odour near the material gate.
2) The duty officer of the unit also visited the pipeline location across the road and observed that the sea water around the pipeline at about 2 feet from the shore was white in colour.
3) The unit immediately started depressurising the pipeline and completed the entire operation by 12.30 am on 27/12/2023.
4) The wind direction during the accident was observed to be West Southwest in which direction the villages such as Periakuppam and Chinnakuppam are located.
5) They monitored the ammonia level in the ambient air near the material gate using a handheld monitor and found that the ammonia level was 28 ppm during the accident(as against 24 hr average concentration of 0.57 ppm).

6) The unit also received information from the local Asst Commissioner of Police regarding the complaints received from the public on ammonia odour from Periakuppam, Chinnakuppam and a few other villages. Police and the District Administration along with the unit arranged ambulances and public transport for managing any emergency situation. A fewpeople from the above villages also received first aid due to eye irritation and breathing difficulties.

Tamil Nadu Pollution Control Board is a statutory authority responsible for enforcing the Water (P & CP) Act, 1974 and the Air (P&CP) Act, 1981 by granting consent for the discharge of effluent and emission and for enforcing certain Rules enacted under the Environment (Protection) Act 1986 such as Hazardous and Other waste Management Rules, 2016 and Bio medical waste Management Rules, 2016. The responsibility for enforcing the Manufacture, Storage and Import of Hazardous Chemical Rules, 1989, and the Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996 under the Environment (Protection) Act, 1986 in respect of offshore pipelines lies with agencies such as Directorate of Industrial health and Safety and Chief Inspector of Dock Safety.

2. Technical Committee Formation

In the above circumstances, to ascertain the cause of the ammonia leak and to furnish a detailed report of the event, a Technical Committee was constituted by the Tamil Nadu Pollution Control Board vide Proceeding dated 27/12/2023 with the following experts and officials:

S.No.	Name of the officials	Designation & Department
1.	Thiru.R.Kannan	Member Secretary, TNPCB
2	A representative from CPCB, Regional Office, Chennai	CPCB, Regional Office, Chennai
3	Dr. Shankar Narasimhan	Professor, Dept of Chemical Engineering, IITMadras, Chennai
4	Dr. S.V. Srinivasan	Senior Principal Scientist, CSIR-CLRI
5	Dr. C. Saravanan	Principal Scientist, CSIR-NEERI
6	Thiru. M.V.Karthikeyan	Joint Director, Directorate of Industrial Safety and Health

7	Dr. D. Vasudevan	Joint Chief Environmental Engineer, TNPCB Chennai Zone

3. Inspection of the Technical Committee to the unit and the accident site

The Technical Committee inspected the unit and the ammonia pipeline leakage site on 27.12.2023 and 30.12.2023. During the inspection, the Operations Head of the plant has stated the following:

i. Ammonia is received via Ennore Minor Port through ships and transferredfrom there using 50 mm thick,8 inch HDPE pipeline made up of 7 layers. The total length of the pipeline is 2.5 km which is laid underneath the seabed. The depth of pipeline from the sea surface varies from 1 foot near the shore to 18 feet at the mooring point at port.The pipeline is about 25 years old and the normal life of such pipeline is reported to be 50 years by the supplier of the pipeline M/s Nordiske Kabel og Tranaadfabriker (NKT), Denmark. Ammonia is received in liquid form at minus 33^0 C and stored in the storage tank under the same condition.

ii. The pipelines are generally maintained at 2 Kg/cm^2 vapour pressure when no transfer of ammonia takes place. Thirty six hours prior to the transfer of ammonia from the ship, pre-cooling process of pipeline is carried out for pumping ammonia in liquid condition. The unit carries out the pre-cooling and ammonia transfer operation only after informing the Tamil Nadu Maritime Board.

iii. The unit carries out the safety audit of pipeline internally every year and under the supervision of Indian Registrar of Shipping, a competent agency once in 5 years. The last audit under the supervision of Indian Register of Shipping (IRS) was held on 22.07.2022 (Annexure I) and the last internal audit was carried out by unit on 17.03.2023 (Annexure II)

iv. The unit carries out safety audit of the APPS and its allied plants every year and submits the report to Director of Industrial Safety and Health (DISH), Department of Labour Welfare and Skill development, Govt. of Tamil Nadu. The last report was submitted on 02.02.2023.(Annexure III)

v. The unit has prepared and submitted the Onsite Emergency Preparedness Plan to the Director of Industrial Safety and Health (DISH) and the DISH has taken the plan on record vide Proc dated 25/07/2022.(Annexure IV)

vi. As a ship containing 6000 T of ammonia was expected on 28/12/2023, the unit started the pre-cooling operation of the subsea pipeline at around 8.00 pm on 26/12/2023. The pressure inside the pipeline is raised normally upto 5 kg/cm^2 in about 5 hours and maintained at the same level throughout the pre-cooling operation.

vii. The unit observed pressure drop in the pipeline at around 11.30 pm and observed pungent ammonia odour near the material gate. Suspecting ammonia leak in the pipeline the unit immediately started depressurising the pipeline and completed the operation by 12.30 am.

viii. The unit has also stopped the operation of APPS plant and phosphoric acid plant and reduced the capacity of Sulphuric acid plant immediately after the accident on the early hours of 27.12.2023. The sulphuric acid plant was also shut down later on 28.12.2023.

ix. The unit has planned to identify the exact location of the pipeline damage and its extent shortly and to rectify the same as early as possible.

It was ascertained from the unit and from the hospital that the ammonia gas leak which lasted for about an hour affected a few people in the nearby villages of Periakuppam and Chinnakuppamby causing eye and throat irritation and breathing difficulties. On 27/12/2023,42 people got admitted in the Akash Hospital out of which 4 were in ICU and 10 people got admitted in Stanley Government Hospital out of which 1 person was in ICU.As on 02/01/2024, all people got discharged from the hospital except one person who is in the normal ward of Akash Hospital.

TNPCB monitored the concentration of ammonia using handheld ammonia monitors in the ambient air at 3.30 am near the Material gate and found its concentration as 3 ppm (as against 24 hr average concentration of 0.57 ppm) The ammonia level in the ambient air was also monitored in the followingplaces

a. Near Ammonia pipeline leak identified area : 3 ppm at 3.51 am
b. At Thalankuppam village: 0 ppm at 4.02 am

c. At Periakuppam village: 0 ppm 4.09am
d. At Chinnakuppam village: 0 ppm 4.12 am
e. At Ernavurkuppam village: 0 ppm 4.15 am
f. At Kathivakkam Railway bridge: 0 ppm 4.17 am
g. At Ennore near Gulf Oil Gate: 0 ppm, 4.20 am
h. At Ennore bus depot: 0 ppm at 4.24 am

The concentration of ammonia in the ambient air at the pipeline leak area became 0 ppm during subsequent monitoring on 28/12/2023. TNPCB's Continuous Ambient Air Quality Monitoring (CAAQM) station in Kathivakkam which is about 1.5 km from the unit on west direction recorded maximum ammonia level in the ambient air on 27.12.2023, 2.15 AM as 0.0713 ppm and then the concentration reduced to 0.0143 ppm at 3.45 AM.

Ammonia level monitoring in the ambient air

The concentration of ammonia in the sea water collected near the pipeline site was 48 mg/L at 3.49 am on 27/12/2023 and reduced to 8.1 mg/L at 1.50 pm on 27/12/2023 (TNPCB standard for the discharge of trade effluent in marine coastal area is 5 mg/L)

At the time of inspection by the Committee on 27/12/2023 no ammonia odour was felt both inside the plant and in the nearby areas.The technical committee could not see the affected portion of the pipeline as it is submerged.

Technical Committee inspecting the pipeline in the seashore

4. Industry Details

The unit of M/s Coromandel International Limited is located on Express Highway at Kathivakkam Village, Ennore. The unit was established in 1963 by M/s EID Parry and M/s EID Parry was merged with Coromandel fertilizer in the year 2003. The name of the unit was later changed as Coromandel International Ltd in 2009.The industry is surrounded by road followed by Bay of Bengalin the eastern side, Ennore Railway Station in the Western side, M/s. Hinduja Foundries in the Southern side and Kothari Industrial Corporation Ltd-Fertilizer Division in the Northern side. The Periyakuppam village is located adjacent to the unit and Chinakuppam villageis located at about 750 m from the unit in the West Southwest direction.There are two facilities in the unit, one is fertilizer and allied facility and the second is ammonia storage and offshore ammonia pipeline facility. Total Plant land area is 20.24 Hectares out of which Fertilizer Production process occupies 17.11

Hectares and Ammonia storage facility occupies 3.13 Hectares. The Google image showing the location of the industry is shown below:

Google map showing the location of Coromandel International Ltd

4.1 Fertiliser Unit - Ammonium Phosphate Potash Sulphate (APPS) facility

The latest Consent to Operate (CTO) for the fertilizer unit was issued for expansion activities vide Board's Proc.No.T1/TNPCB/F.0101AMB/RL/AMB/W&A/2023 Dated.20.10.2023 with validity upto 31.03.2028. The unit has also obtained Authorization for handling Hazardous waste videProceeding No. T1/TNPCB/F.0101AMB/HWA/RL/AMB/2022 dated 06.09.2022 valid upto 31.03.2027.The details of the product, raw materials, effluent, and emission of the fertilizer unit are as follows:

4.1.1. Product

Product Name	Quantity	Unit
Ammonium Phosphate Potash Sulphate (APPS)	400000	TPA

4.1.2 Raw-Material

Raw-Material Name	Quantity	Unit
Ammonia	44880	TPA
Sulphuric Acid	44880	TPA
Phosphoric Acid	188100	TPA
Ammonium Sulphate	107910	TPA
Muriate of Potash (MOP)	105600	TPA
Sulphur	81840	TPA
Rock Phosphate	239250	TPA
Sulphuric Acid	164340	TPA

4.1.3. Sewage and trade effluent details

Sewage			
Sl. No.	Description	Quantity	Point of disposal
1.	Sewage	10 KLD	On industry's own land
Trade Effluent			
1.	Reject Water from Multiple Effect Desalination (MED) Plant	4800 KLD	To Sea
2.	Cooling Tower Blow Down &Condensate Recovery Water	1095 KLD	Recycling to process

4.1.4. Emission details

Stack. No	Point Emission Source	Air pollution Control measures	Stack height from Ground Level in m
1	Sulphuric Acid Plant -1	Alkali scrubber with stack	38.2
2	Sulphuric Acid Plant -2	Alkali scrubber with stack	50
3	Phosphoric Acid Plant	Wet scrubber with stack	36
4	Ball mill in Phosphoric Plant	Bag Filters with stack	24

5	Ammonium Phosphate Potash Sulphate Plant	Wet scrubber with stack	49
6	Bagging Plant	Dust collectors with stack	35
7	Sulphuric Acid Plant- Steam Header	Steam Vent	10
8	CPP Steam Header	Steam Vent	15
9	MED Steam Header	Steam Vent	8
10	DG Set – 1000KVA	Stack	10.4

4.2 Ammonia storage facility

The ammonia storage facility was set up in the year 1996 and the unit has obtained consent in the name of M/s.Coromandel International Limited - Ammonia Storage Terminal Facilityand subsequently obtainedrenewal of consent vide Board's Proc.No. F.0102AMB/RL/JCEE-M/TNPCB/AMB/W&A/2023 Dated: 12.05.2023 with validity upto 31.03.2028. The details of the facility are as follows:

4.2.1. Product

Product Name	Quantity	Unit
Liquid Ammonia imported through ships anchored at 2 to 3 km from sea shore will be pumped into storage tank through submarine pipeline to tank and the mooring location. The liquid ammonia will be stored in double integrity storage tank at minus 33deg C	12500	MT

4.2.2. Sewage and trade effluent

Sewage :			
Sl. No.	Description	Quantity	Point of disposal
1.	Sewage	1.0 KLD	On Industry's own land
Trade Effluent :			
1.	Trade effluent (cooling water blow down)	5.0 KLD	Into Sea through the existing marine outfall provided by fertilizer factory
2.	Coolingwaterblowdown	120.0 KLD	Into Sea through the existing

	Once ina month shipunloading		marine outfall provided by fertilizer factory 120.0 KL (Once in a month during ship unloading time)

4.2.3. Source of emission

Stack. No	Point Emission Source	Air pollution Control measures	Stack height from Ground Level in m
1	DG-750 KVA	Stack	18
2	Ammonia storage tank Flare	Stack	30
3	DG - 1250 KVA	Stack	30
4	DG - 1250 KVA	Stack	30
5	DG - 1500 KVA	Stack	30

4.3 The details of various storage Tanks available in the unitareas below

Sl. No.	Chemicals	Design capacity	Type of Storage Tanks
01.	Ammonia (Ammonia terminal)	12500 Tons	Atmospheric ammonia storage tank (LTCS)
02.	Sulphuric Acid (SAP1)	Tank 1 - 1566 MT Tank 2 - 1566 MT Tank 3 - 1566 MT Tank 4 - 2943 MT Day tank - 92 MT	MS tank
03.	Phosphoric Acid (APS)	Tank 12 - 340 MT Tank 9 - 240 MT Tank 10 - 90 MT Tank 11 - 90 MT	MSRL Tanks
04.	Sulphur (SAP2)	30000 Tons	Open Yard
05.	Caustic Soda Lye (WTP)	17 KL	MS Tank
06.	Hydrochloric Acid (WTP)	15 Tons	FRP Tank
07.	Diesel (WTP)	22 KL	Underground Tank
08.	Furnace Oil (WTP)	33 KL, 10 KL	MS Tanks
09.	LP Gas (near MED)	1000 Kg	Cylinders

5. Ammonia Characteristics

Ammonia is an inorganic chemical compound of nitrogen and hydrogen with the formula NH_3. Ammonia is a colourless gas with a characteristically pungent smell. It is lighter than air, its density being 0.589 times that of air.Ammonia (NH_3) boils at minus 33.3 °C at a pressure of one atmosphere, so the liquid must be stored under pressure or at low temperature. About 80% of the ammonia produced in industry is used in agriculture as fertilisers in various forms and composition, such as urea and ammonium phosphate. Ammonia is also used as a refrigerant gas, to purify water supplies, and in the manufacture of plastics, explosives, fabrics, pesticides, dyes, and other chemicals.

5.1 General Physical Properties of Ammonia

i. Chemical Name: AMMONIA
ii. Chemical Classification: ALKALI
iii. Trade Name: ANHYDROUS AMMONIA
iv. Boiling Range / Point: (-) 33.30°C
v. Melting/ Freezing Pt:(-)77.7°C
vi. Physical state: Gas
vii. Appearance: Colourless.
viii. Odour: Strongly pungent

5.2 Health Hazards of Ammonia

i. Nature of chemical hazard: Toxic
ii. Routes of entry: Through eyes, nose, and throat.
iii. Effects of Exposure: Vapour – Poisonous if inhaled, irritation to eyes, nose, throat.

5.3. Symptoms

Ammonia at 700 ppm(parts per million) causes eye irritation and permanent injury if prompt medical health care not taken. Higher concentration of 5000 ppm causes immediate death from spasm, inflammation, or Edema of the larynx. Low concentration of 400 ppm causes immediate nose and throat irritation.

a. Respiratory irritation: Ammonia is a respiratory irritant and can cause irritation of the nose, throat, and lungs. Exposure to high concentrations of ammonia vapor can lead to coughing, wheezing, and difficulty breathing.

b. Eye Irritation: Contact with ammonia gas or liquid can cause irritation and burning of the eyes. In severe cases, it may lead to corneal damage.

c.Skin Irritation: Ammonia can cause skin irritation, including redness, itching, and burns. Prolonged or concentrated exposure may result in more severe skin damage.

d. Inhalation Risks: Inhaling high concentrations of ammonia vapor can lead to respiratory distress and, in extreme cases, can cause lung damage or respiratory failure. Individuals with pre-existing respiratory conditions may be more susceptible.

e. Systemic Effects: Ingesting or inhaling large amounts of ammonia can have systemic effects on the body, affecting organs such as the liver, kidneys, and the nervous system.

f.Corrosive Properties: Ammonia is corrosive to certain materials and contact with metals like aluminium can produce flammable hydrogen gas. It can also corrode certain types of plastics.

g.Combustibility: While ammonia itself is not highly flammable, it can support combustion under certain conditions. Combining ammonia with certain substances, such as chlorine, can result in the release of toxic and potentially explosive gases.

5.4Short Term Exposure Limit (STEL) and Threshold Limit Value (TLV)

The Short Term Exposure Limit (STEL**)** value is37 ppmand Threshold Limit Value (TLV) is 25 ppm.

5.5. **Personal Protective Equipment**

Use rubber boots/gloves, face shield/safety goggles. Use self-contain breathing apparatus/gas mask. Use full body protection in case of liquid Ammonia.

The Material Safety Data Sheet (MSDS) containing the above details and the details of precautionary and other statements is enclosed in Annexure V

6. The sequence of the events that occurred before and after the ammonia leak

There was an ammonia leak to the environment during the pre-cooling operation of offshore pipeline owned and operated by M/s. Coromandel International Ltd., Ennore on 26th late night at 11.30 pm. The pre-cooling operation was being carried out using liquid ammonia in storage tank in preparation to receive a shipment of 6000 tons of ammonia on 28th Dec 2023. The following is the sequence of the events that occurred before and after the ammonia leak.

- The inspection team from Coromandel International carried out visual inspection of the pipeline with help of marine divers and nothing abnormal was observed on 23.12.2023 as part of the regular inspection before transfer of ammonia from ship to storage facility. The pressure in the main (PI-10141) and return lines were 1.9 kg/cm^2 (PI - 10143) which were normal.
- At 8.00 PM, 26.12.2023 – Pre-cooling operation was started by lining up loading pump B and the pressure in the pipeline was gradually increased from 1.9 kg/cm^2 by the control panel operator of the second shift (2 PM to 9.45 PM) as per Standard Operating Procedure (SOP)(Annexure VI).
- 9:00PM, 26.12.2023: Pressure in main line was 2.3 kg/cm^2 and return line was 2.1 kg/cm^2
- 10 PM, 26.12.2023 – Mr. Ravi, Control panel operator (Third shift) took charge of operation and he continued the pre-cooling operation, since the pressure sensors showed normal values.
- 11.00 PM, 26.12.2023 – Second loading pump (A) was brought under operation and the pressure in the main line and return line reached 3.8 kg/cm^{2}and 3.3kg/cm^2, respectively.
- 11.22 PM, 26.12.2023 – The pressure in the mainline started dropping rapidly and operator observed some abnormality and asked the field operator to check for any sensor abnormality. None of the nineteen ammonia sensors within the plant showed any abnormal levels. The field operator did not detect any ammonia odour in the plant.

- 11.35 PM, 26.12.2023 - Shift Executive, Mr. Balamurali Krishnan sensed ammonia near his cabin and near the weighbridge gate but not near APPS plant and suspected that there might be a leak from the pipeline.
- 11.35 PM, 26.12.2023 – Based on the instruction of Shift Executive, isolated the pipeline and started de-pressuring operation to evacuate the ammonia remaining in the pipeline to the storage tank.As a safety precaution, the operator closed the valves of ammonia feed lines of both pumps to stop further transfer of ammonia to the pre-cooling pipeline. Pump A tripped due to low pressure (almost zero) in the main line, but it was immediately restarted. Both pumps A and B continued to operate in the recirculation mode.
- 11.40 PM, 26.12.2023 Shift Executive informed leakage of ammonia to Unit head, Head of Production and higher officials.
- 00.10 AM, 27.12.2023 - Shift Executive came out of the plant to inspect the pipeline near the entry point of the sea and noticed that some white colour in the seawater.
- 00.30 AM, 27.12.2023 – Operator has informed that the depressuring operation was complete and the pressure in the return pipeline also was reduced to zero and informed to Plant Manager and Shift Executive.
- 00.45 AM, 27.12.2023 – By this time TNPCB and DISH were informed by Coromandel representatives about the release of ammonia.
- 02.15 AM, 27.12.2023 – TNPCB officials JCEE(M), Chennai, DEE (Ambattur) and AEE (Manali) and Joint Director, DISH reached the accident site and inspected.
- 3.30 to 4.30 AM, 27.12.2023 – TNPCB officials monitored the ammonia levels in ambient air using hand held ammonia meters and the results are given in Annexure VII. The maximum concentration was found to be 3ppm as against the standard of 0.57 ppm. Seawater samples were also tested for ammonia and found to be 48 mg/L against marine discharge standards of 5 mg/L.
    - The unit has stopped the operation of the APPS plant and reduced the production of sulphuric acid plant immediately and subsequently stopped the sulphuric acid plant also on 28.12.2023.

- The details of ammonia level in the ambient air monitored using portable ammonia meter at various locations from 26.12.2023 to 30.12.2023 provided in Annexure VII
- The details of ammonia level monitored in Continuous Ambient Air Quality Monitoring (CAAQM) Station at Kathivakkam on 26.12.2023 and 27.12.2023 provided in Annexure VIII.
- The details of ammonia level in sea water at different locations from 26.12.2023 to 30.03.2023 provided in AnnexureIX.

7. Cause of the Accident and Findings

The offshore pipeline is a seamless seven layer HDPE pipeline of 8 inch dia, 5 cm thick and 2.5 KM length. The pipeline is in operation for about 25 years now. It is laid at the depth of 1 foot below the sea surface near the shore and 18 feet near the port. The pipeline is brought outside from the sea to the land near shore and it crosses the Ennore Beach Road through a bridge to reach the plant. The end of the pipeline at the plant is connected to the ammonia storage tank through 14" pipeline and the end of it near the port is connected to flexible hose through which ammonia will be pumped from the ship. To avoid the erosion of Ennore Beach Road due to wave action, huge size granite boulders are placed all along Beach Road. Large numbers of such boulders are found near the ammonia pipeline.

The important specifications of the offshore ammonia pipeline are:

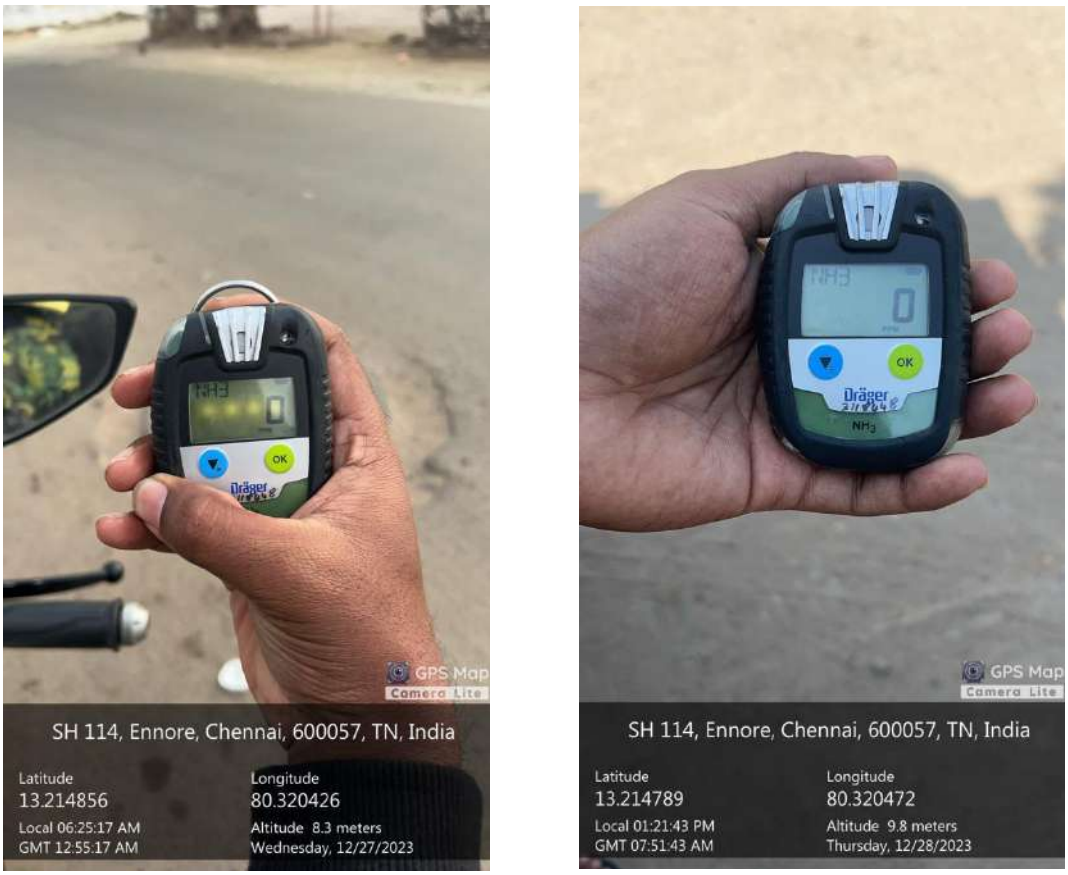
i. Design life : 50 years
ii. Design pressure : 25 Kg/cm^2
iii. Bursting pressure : 130 Kg/cm^2

The pipeline is subjected to safety check every year by the internal team at the working pressure of 6 Kg/cm^2 and once in 5years under the supervision of IRS, a competentagency at the pressure of 8 Kg/cm^2.

The unit has informed that heavy movement of granite boulders near shoreline that happened over the pipeline during the recent Michaung cyclone could have damaged the pipeline. The damage was not severe enough to cause the ammonia vapour leak when the pressure inside the pipeline was 2 Kg/cm^2. However, when the pressure in the pipeline was increased steadily from 2 Kg/cm^2 during the

pre-cooling operation, the damaged pipeline gave way at 3.8 Kg/cm^2 resulting in release of ammonia vapour into sea water. The unit has also informed that no abnormalities were observed inside the APPS manufacturing plant.

The concentration of ammonia in the ambient air was 0 ppm at all the monitored locations on 28th, 29th and 30th(Annexure VII). There was drastic reduction in the concentration of ammonia level in the sea water near the offshore pipeline at the shore from 48 mg/L on 27/12/2023 morning to less than 1 mg/L on 28th and on subsequent days (Annexure IX). Alsothe technical committeeobserved no ammonia odour during inspection. All these indicate that ammonia leak has been completely stopped and no further leak has been happening.



Ammonia level monitoring in the ambient air

Based on the sequence of events and monitoring data, it is concluded that the ammonia leak occurred from the under-sea pipeline close to shore and not from the plant site. This conclusion is based on the following facts

i. The sudden pressure drop in the main pipeline around 11:30PM on 26/12/2023 recorded in the control panels, indicated that a leak from the pipeline has occurred
ii. No abnormalities were observed in the APPS manufacturing or allied plants and operations were quite normal.
iii. The duty officer who first visited the pipeline area observed significant white colour formation at about 2 feet from the shore over the pipeline and ammonia odour.
iv. It has been told to the unit by public who reached the site immediately after noticing the ammonia odour, that they saw bubbles coming out of pipeline with a murmuring sound.
v. During the ammonia leak accident at around 11.30 pm the wind direction was southwest and hence people of Periakuppam and Chinnakuppm village which are located in the wind direction were affected.
vi. None of the nineteen ammonia sensors located within the plant detected an abnormal amount of ammonia (the low limit threshold for these sensors was set at 5ppm and the high limit threshold was set at 10ppm). All the ammonia sensors located inside the plant are either in the west and northwest direction of the pipeline location and hence no sensors detected the ammonia leak. It also indicated that there was no leak of ammonia near the ammonia storage tank.
vii. The water samples taken from a location close to where the pipeline enters the sea indicated a high level of ammonia ie. 48 mg/L on 27/12/2023 at 3.49 am(TNPCB standard for the discharge of trade effluent in marine coastal area is 5 mg/L) and ammonia concentration in the ambient air was found to be 3ppm at around 3.50 am on 27/12/2023 near the same point. (as against 24 hr average concentration of 0.57 ppm)

The details of the plan provided by the unit for damage detection and repair of the offshore pipeline are provided in Annexure X.

8. Precautions that could have avoided the accident

Although the unit observed significant relocation of heavy granite boulders around the pipeline due to cyclone during the pre inspection, the unit has not taken the observation seriously and started the pre-cooling operation as usual. Had the unit suspected that the heavy movement of the boulders would have caused damage to the pipeline and conducted safety check prior to pre-cooling, release of ammonia into the atmosphere could have been avoided or reduced significantly.

Similarly, it was observed in the control panel at 23.23 hrs on 26.12.2023, loading Pump-A got tripped due to low discharge pressure of 4.2 kg/cm^2. But Loading Pump-B did not tripsince the discharge pressure at this point was 4.4 kg/cm^2 (Both pumps are set to trip if the pressure falls below 4.2 kg/cm^2).The operator restarted the loading pump-A at 23.24 hrs after it got tripped due to pressure drop assuming that the pump got tripped for no specific reasons without verifying the ground realities. They should have stopped ammonia liquid pumping and switched on Automatic Re-circulation Valves. They realised that the pump A got tripped only due to ammonia leak in the pipeline only after 13 minutes. If they had suspected that the pump A got tripped due to ammonia leak, they would have not restarted the pump and thereby could have minimizedsubstantial quantity of ammonia release in the atmosphere.

As the unit failed to take necessary safety precautions for the safe operation of offshore ammonia pipeline, the pre-cooling operation resulted in the release of ammonia gas into the environment and affected the health of the people of nearby villages, the quality ambient air and the sea water and hence the unit is solely responsible for the above accident and shall be legally liable to pay environmental compensation for the damages caused to the environment and public health.

9. Authorities Responsible for Handling Chemical Emergencies

As required by the Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996 under the Environment (Protection) Act, 1986, Government of Tamil Nadu has formed State, District and Local crisis group in 1998 vide G.O. No. 109 E&F Dept dated 23.04.1998, and reconstituted the same in 2007 vide G.O No. 135 E&F Dept dt 07.12.2007 with specific roles and responsibilities for

preparing and implementing onsite and offsite emergency preparedness plans and for managing emergencies arising out of major chemical disasters. The District Crisis Group with the District Collector as its Chairman and Inspector of Factories (JD) as Member Secretary is the apex body in the district to deal with major chemical accidents and to provide expert guidance for handling chemical accidents. The Local Crisis Group with Revenue Divisional Officer (RDO) as its Chairman and Inspector of Factories (DeputyDirector) as Member Secretary is the body in theindustrial pocket to deal with chemical accidents and co-ordinate efforts in planning, preparedness and mitigation of chemical accidents.

As per Manufacture, Storage & Import of Hazardous Chemical Rules, 1989, the Chief Inspector of Factories is responsible for accidents in respect of industrial installations, isolated storages and pipelines dealing with hazardous chemicals covered under Factories Act and the Chief Inspector of Dock Safety is responsible for accidents in respect of industrial installations, isolated storages and pipelines dealing with hazardous chemicals covered under Dock Workers Act, 1986. The responsibilities of various authoritiesduring accidents involving hazardous chemicalsas per Schedule 5 of Manufacture, Storage & Import of Hazardous Chemical Rules, 1989are provided in the following table:

Authority	**Responsibility**
CPCB/SPCB	(1) Enforcement of directions and procedures in respect of isolated storage of hazardous chemicals, regarding,- (i) Notification of major accidents as per rule 5(1) and 5(2). (ii) Notification of sites as per rules 7 to 9. (iii) Safety reports in respect of isolated storages as per rules 10 to 12. (iv) Preparation of on-site emergency plans as per rule 13. (2) Import of hazardous chemicals and enforcement of directions and procedures on import of hazardous chemicals as per rule 18
Chief Inspector of	Enforcement of directions and procedures in respect of industrial installations and isolated storages covered under the Factories Act, 1948, dealing with hazardous chemicals and pipelines including

Factories	inter-state pipelines regarding (i) Notification of major accidents as per rule 5 (1) and 5(2). (ii) Notification of sites as per rules 7 to 9. (iii) Safety reports as per rules 10 to 12 (iv) Preparation of on-site emergency plans as per rule 13. (v) Preparation of off- site emergency plans in consultation with District Collector or District Emergency Authority 3, as per serial No.9 of this Schedule.
Chief Inspector of Dock Safety	Enforcement of directions and procedures in respect of industrial installations and isolated storages dealing with hazardous chemicals and pipelines, inside a port (covered under the Dock Worker (Safety Health and Welfare Act) 1986, regarding,- (i) Notification of major accidents as per rule 5(1) and 5(2). (ii) Notification of sites as per rules 7 to 9. (iii) Safety reports as per rules 10 to 12. (iv) Preparation of on-site emergency plans as per rule 13. (v) Preparation of off-site emergency plans in consultation with District Collector or District Emergency Authority as per serial No.9 of this Schedule
District Collector or District Emergency Authority	Preparation of off-site emergency plans as per rule 14.

In the case of M/s. Coromandel International Limited, even though the industry is involved in the storage of various hazardous chemicals, including Ammonia gas, the said factory premises is not falling within the definition of isolated storage. Ammonia gas received in marine vessels, are off-loaded into the pipeline, directly from the vessel to the pipeline, which join with the

Ammonia storage Tank within the Factory premises. In the case of offshore pipeline carrying Ammonia gas located outside the premises, the preparedness and response in case of emergencies lies with Chief Inspector of Dock Safety.

10. Estimating the quantity of ammonia (unaccounted) that could have leaked based on mass balance

The amount of unaccounted ammonia is estimated based on level measurements in the storage tank before and after the incident and is computed as follows:

At 19:00 hrs on 26/12/23 the level of ammonia in storage tank was 7.9678m (before the leak) and at 01:30 hrs on 27/12/23 the level of ammonia in storage tank was 7.7738m (after the leak and all operations in the plant involving use of ammonia was stopped). Based on dimensions of the tank 1m level corresponds to 585.5tons of liquid ammonia. Thus, the total amount of ammonia discharged from tank during this period was ((7.9678 - 7.7738) * 585.5) = 113.59 tons. The production of APPS started at third shift (4PM to 12:00PM) and produced 290.26T of APPS and consumed 67.92T of ammonia on 26/12/2023. However, if we calculate the ammonia consumed operating the APPS plant during 19:00 hrs to 23:30 hrs on 26/12/23 is 67.92/7.5 *4.5 = 40.752T. The difference is113.59 – 40.752 = 72.838tons.However, the level of ammonia in storage tank on 28/12/2023 was increased to 7.7827m (due to recirculation of ammonia vapours from the pipeline to storage tank) thus increasing in 0.0089m amounting to 5.2tons of ammonia. Therefore, the difference is 72.838tons–5.2tons=67.638tons of ammonia is unaccounted.

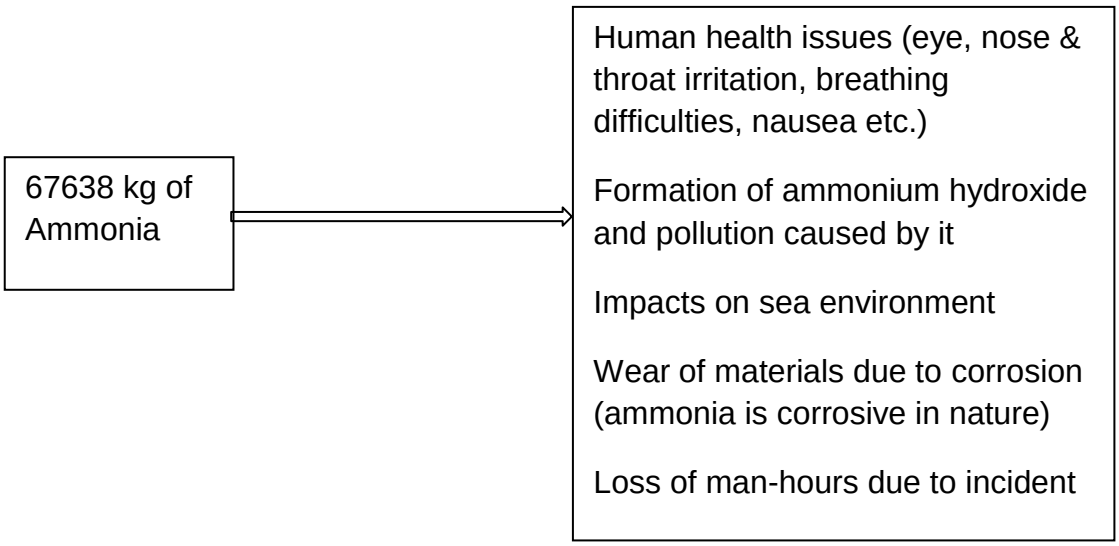
The unit claims that during pre-cooling operation on 26/12/2023 with pipeline ID of 0.184m, length of 4200m at -20^{0}C temperature & 3 bar pressure, the total quantity of ammonia present in the pipeline is 70.858tons and due to re-circulation 5.2 tons of ammonia returned to storage tank and remaining 65.658tons ofaqueous ammonia is present in the pipeline. However, the industry has not provided any document on quantity of ammonia present in the pipeline after leakage. Hence, the

Committee is of the opinion that the unaccounted quantity of ammonia 67.638tons is released into environment during leakage on 26/12/2023.

11. Valuation of environmental damages due to Ammonia gas leakage

CPCB prepared a Guidelines “Integrated Guidance Framework for Chemicals safety in respect of the isolated storages and industries covered under Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 in compliance to the Hon’ble NGT order dated 11.06.2021 in OA No. 60 /2021 and circulated to all SPCBs. CPCB also issued advisory dated July 01, 2020 to all SPCBs/PCCs that industries do not operate/restart their operation without valid consent to operate (CTO) and taking adequate measures to prevent accidents and comply with all the provisions of Water (P&CP) Act, 1974, Air (P&CP) Act, 1981 and Environment (Protection) Act, 1986. In case of accidents releasing pollutants in the environment, SPCBs/PCCs shall monitor environmental quality for relevant parameters and duration to assess environmental impacts and damage. They shall also recover environmental compensation towards damage and restoration.

The damage caused and the level of impact due to ammonia release into ambient air & water by ammonia gas leakage is expressed in monetary terms by the technical team which is one of way to calculate the scale of impact. It is essential to understand the mechanism by which the impact happens to quantify the impacts in monetary terms. The impact pathways reveals, how an emitted pollutants lead to different adverse effects on human health and natural environment. The technical committee has used opportunist cost method to express the damage in monetary terms.



For valuation of ammonia (NH_3), UK Department for Environment, Food and Rural Affairs (Defra) values have been taken for calculating the monetary values of damages. UK Defra values are converted into Indian values using suitable conversions. The Indian values per tonne of emission hence arrived are used for valuation of damages.

$$NH_3 + H_2O = NH_4OH$$

Valuation of environmental damages due to ammonia leakage	=	Pricing of 84460kg of ammonia released
	=	A^*
	=	876INR/kg of ammonia x67638kg
	=	5,92,50,888/-
	=	Rs.59250888 /- is pricing for impact to environment (Rupees Five Crores ninety two lakhs fifty thousand eight hundred eighty eightonly)
A^*	=	UK Defra lower values are adopted considering nature of impact = €10/kg of ammonia = €10 x INR exchange rate + inflation rate in 2023 = 10 x 84.6028 + 10x84.6028x3.6/100 =876/kg of ammonia Ref: Environmental Prices Handbook, EU28 version published in October 2018. *Ref: Report of the Joint Committee in the matter of OA No. 107/2020 (PB and Report of the Joint Committee in the matter of OA No. 40/2021 (PB Delhi)were accepted by the Hon'ble NGT (PB) Delhi*

12. Recommendations

To prevent the recurrence of such accidents in the future, the committee recommends the following measures:

i. The existing pipeline is already past half its expected lifetime. Therefore, it is strongly recommended that the unit shall replace the existing offshore pipeline by a new pipeline with the state of the art monitoring, automatic control and accident prevention system at the minimum possible time.

ii. The pipeline is not properly protected at the location where it emerges out of sea water and crosses the road the reach the plant. It has to be properly secured and made not easily reachable to general public to avoid any accidental damage.

iii. Before every pre-cooling and ammonia transfer operation, the unit shall carry out a mandatory pressure test using nitrogen gas to check the integrity of the pipeline. This should be in addition to the visual inspection being currently carried out as part of the Standard Operating Procedures (SOP). Only after ensuring that the pipeline is intact and safe, should any ammonia be transferred to the pipeline.

iv. The unit shall provide adequate number of ammonia sensors all around the plant so as to detect the ammonia in the ambient air at all wind directions. The unit shall provide ammonia sensors near the offshore pipeline where it crosses the express highway from the shore to the plant. The unit shall provide ammonia sensors in the villages located all around the plant so as to provide early warning to the public in case of ammonia leak. The unit shall also carry out onsite and off-site emergency preparedness studies by credible agency for both APPS and ammonia storage alongwith off-shore pipeline facility. The unit shall also implement the recommendations of both on-site and off-site studies before operation of the plant.

v. The unit shall ensure that any ammonia vapour let out of the storage through the pressure relief valve line or through the boil off compressor line is sent only through the flare and not directly vented to the atmosphere.

vi. The unit shall install water curtain system, fire water nozzle operated by motor in ammonia feed pumps to reduce the impact of ammonia leakage. The water curtain system needs to be linked with high ammonia alarm received from

ammonia sensor in field/control room. Whenever high ammonia content alarm is received from ammonia sensor automatically water curtain system should start.

vii. The unit shall explore an option of automatic tripping system during pressure built up, leaks etc., in the pipeline.

viii. The unit shall provide necessary arrangements including high volume sirens to alert the people of the nearby villages during accidents and abnormal operations of the plant.

ix. The unit shall conduct capacity building campaigns to the public of all the nearby villages on the Dos and Don'ts during emergencies including the emergency evacuation procedures.

x. TNPCB shall take immediate action to direct the unit to pay the environmental compensation as assessed by the committee for the damages caused to the environment and the public health due to the ammonia gas leakage.

xi. TNPCB shall take immediate action to file a criminal case against the unit and its occupier for the non compliance with the conditions of the consent order issued under the Air Act.

xii. The unit shall keep the people of all the villages located around the plant informed of the pre-cooling and ammonia transfer operations and the Dos and Don'ts in case ammonia odour is sensed by the people and also organise mock drills based on off-site plan organised by the District Administration and DISH.

xiii. The unit shall monitor ambient ammonia level every hour at the offshore pipeline at the shore point, at the mooring point and at the villages located within 2 km from the plant in the prevailing down wind and upwind directions during the pre-cooling and unloading operations and communicate the consolidated report to DISH and TNPCB

xiv. The unit shall monitor the ammonia concentration in the sea water on daily basis near the offshore pipeline at shore point, at mooring point and at a few locations in between the shore and mooring point during the pre-cooling and unloading operations.

xv. The unit shall upgrade the present semiautomatic (partly automatic, partly manual) into a fully automatic control system with interlock facility at all necessary points in the entire plant operations including Ammonia plant and ammonia unloading pipeline operations.

xvi. The unit shall make the safety audit report of the offshore pipeline and the fertiliser plant that are carried out periodically by the credible agency be available to public by publishing the same in theirwebsite.

xvii. The unit shall carryout safety audit of the ammonia storage tank, all other hazardous chemical storage tanks, and all hazardous chemical pipelines prior to restarting of the APPS plant by engaging a credible agency.

xviii. The unit shall carryout risk assessment and HAZOP study of offshore ammonia pipeline and the fertiliser plant through CSIR-CLRI or by any other credible agency periodically and place all the necessary system and preparedness are in place as per the recommendations of the study.

xix. The unit shall conduct comprehensive safety and hazard audit, identify non-compliances and take corrective measures for identified non-compliances. Emergency plans shall be established to deal with leakages.

xx. The unit shall provide essential Personnel protective equipment like nose mask, Helmets, Safety Shoes, Safety Glasses, chemical Proof Gloves, chemical proof body suit/clothing, self-contained breathing apparatus to all its employees and make it mandatory that the employees have to wear PPE's during working hours.

xxi. The unit shall strictly comply with the directions issued by Tamil Nadu Pollution Control Board under section 33A of Water(P&CP)Act, 1974 and under section 31A of Air(P&CP)Act, 1981 vide Proceedings dated 27.12.2023.

S.V. Srinivasan
Dr S.V.Srinivasan
Sr Principal Scientist, CSIR-CLRI

Prof. Dr Shankar Narashiman
IIT Madras

Ms Poornima B.M
Scientist-D, CPCB - RO

M.V.Karthikeyan
Joint Director, DISH

D. Vasu
Dr D.Vasudevan
JCEE(M), TNPCB

R.Kannan
Member Secretary, TNPCB

Annexure I

Safety Audit of offshore pipeline conducted under the supervision of IRS

Indian Register of Shipping

Port : CHENNAI

Date : 31/07/2022

Report No. : MDR22X095

STATEMENT OF FACT

At the request of Coromandel International Limited, the undersigned surveyor to this society attended at Ennore Minor Port from 06/07/2022 to 22/07/2022 for the purpose of inspection of Quick Release Hook, Mooring hook and Elastomer buoy in accordance with OEM Procedure for Mooring Buoy No.1, 2, 3 & 4 and witness the pressure test of NKT Flexible Unbonded pipeline and DUNLOP Submarine Hose located at Ennore minor port (Location:).

The below reports were reviewed satisfactorily.

1) Dimension report of Quick release hook.

2) Dye Penetrant test for Chain links.

3) Dye Penetrant test for Quick release hook.

4) UT Flaw detection for mooring component.

5) Inspection report towards completion of repair based on OEM Procedure from CUMI Carborundum Universal Limited.

6) Mooring Installation Parameters Ref: MDR 96330007:02, dated 08.08.96 issued by DNV.

7) Dimensional drawing for mooring buoy & its accessories - drawing no -1287-05.

8) Coromandel Inspection Report Doc. No: ENN/CORO/NKT/MB-02/IR/01-02.

9) DNV Certificate for Anchor Chain PO Number - GK 220096/93-1237-322. Dated 12-10-95.

10) Analysis report for fibre glass material.

The below reports were witnessed satisfactorily.

1) Dimension for chain link assembly - MB No 1 dated 12-July-2022, MB No 2 dated 06-July-2022, and MB No 3 dated 16-July-222 MB No 4 dated 20-July 2022 through underwater inspection.

2) GPS co-ordinates of Mooring Buoy No 1, 2, 3 & 4.

3) Pressure Testing of NKT Flexible Unbonded Pipeline Proprietary grade HDPE & MDPE (200NB - 2 NOS Approx. length -2KM each) –Doc no. CORO/DH/HT-NKT/IT/05.

4) Pressure test of DUNLOP Submarine Hose 5 Nos interconnected at in situ condition.Doc no. CORO/DH/HT-NKT/IR/01.

Saravanan Ranchatcharam
For Self and K Sathyanarayanan, Sriram Ramaswami
Surveyor(s) to Indian Register of Shipping

Indian Register of Shipping

Based on above mentioned activities, Mooring Buoy No 1,2,3 and 4, NKT Flexible unbonded Pipeline, DUNLOP submarine hose 5 Nos condition were been found satisfactory for operation.

GPS Co-ordinates of Mooring Buoy at the time of verification were as follows

Sr.No.	Mooring Buoy	Latitude & Longitude
1	MB No 1	13Deg12.659' N 80Deg 20.620' E
2	MB No 2	13Deg12.830' N 80Deg 20.562' E
3	MB No 3	13Deg 12.863' N 80Deg 20.706' E
4	MB No 4	13Deg12.705' N 80Deg 20.773' E

This report was issued without prejudice to the terms and conditions of insurance or to any lawful contracts made or to the rights and interests of any or all parties concerned.

Saravanan Panchatcharam
For Self and K Sathyanarayanan, Sriram Ramaswami
Surveyor(s) to Indian Register of Shipping

Coromandel CHENNAI	INSPECTION REPORT	Doc No. / Rev. No. / Date	CORO/DH/HT-NKT/IR/05 / 0 / 23.07.2022
	Plant : Ennore minor Port		murugappa
	Eqpt Name : NKT Subsea pipeline (Onshore to PLEM).		
	Inspection activity : Pressure Test Report.		

Reference Documents:

P&I Drawing No : 0041-PE-UPI-0001 Rev.04 .

Codes & Standards : OEM.

TEST Procedure Doc No : 93-1237-353

Subsea Pipeline Details:

NKT Flexible Unbonded Pipeline Proprietary grade HDPE&MDPE (200NB-2Nos; Approx. Length-2Km each)

Testing Parameters

Testing Medium	:	Operating Medium.
Pneumatic Test Pressure	:	8 kg/cm^2
Date & Testing Starting Time	:	22.07.2022 & 18.00
Date & Testing Ending Time	:	22.07.2022 & 19.00
Holding Time	:	60 minutes.

Remarks: *Tested from onshore battery limit to offshore Subsea PLEM isolation valve at Ennore Minor Port.*

Pressure Gauge Details

Sl. No	Description	Serial / Tag No	Calibrated Date	Due Date	TC No
1	Pressure Transmitter PI-10143 (Make – YOKOGAWA , Range (0 - 10 Kg/cm^2)	PT-10143	05.05.2022	04.05.2023	PG-60-22.
2	Analog Pressure Gauge (Make – GENERAL PRESSURE GAUGES, Range (0 - 10 Kg/cm^2)	G22050046	05.05.2022	04.05.2023	PG-61-22.

Remarks

- No Leakage or Significant pressure drop observed during the holding time and found acceptable.
- Test result satisfactory.

	Performed By (M/s Coromandel)	Witness By (M/s Coromandel)	Witness By (M/s IRS)
Name	SHAHID V.	BARATH KUMAR M	SARAVANAN P
Signature	V. Shahid	23/7/22	
Date			

CORMANDEL INTERNATIONAL LTD. ENNORE INSPECTION

INDIAN REGISTER OF SHIPPING

Annexure II

Safety Audit of offshore pipeline conducted internally

Coromandel	FIELD INSPECTION REPORT		Doc No. Rev. No. Date	CORO/INSP/NKT/AUS/112A/2023 0 **17/03/2023**
	PLANT :	**AT/Ennore Minor Port.**		murugappa
CHENNAI	**ITEM :**	**NKT Line**		

REASON FOR INSPECTION

- New hoses received from Dunlop, UK and erected at Subsea. All the inspection done as per OEM recommendations and got approved by M/s IRS. During this opportunity, NKT line pressure test witnessed.

INSPECTIONS MADE

- Pressure test was witnessed at 6 Kg/cm2 for 1 hour with ammonia vapour and found satisfactory.
- Details as follows
  - Transmitter detail: Tag no- PT-10143
  - Transmitter Range: 0- 10 Kg/Cm2.
  - Calibration due on 04/05/2023.
  - Holding time: 1 hour.

RECOMMENDATION

- Line pressure and visual condition shall be monitored and shall be offered for inspection in the next opportunity.

Report by
K. Sivabalan, Inspection

Annexure III

Safety Audit of fertilizer unit

Coromandel
FUTURE POSITIVE

CE/SHE/DISH/SA/01-2023

02.02.2023

TVR- 738

To

The Directorate of Industrial Safety and Health

SIDCO Industrial Estate

Guindy

Chennai, Tamil Nadu- 600032.

Dear sir,

Sub: Submission of Statutory Safety Audit report -2022 -Reg

Ref: The Tamil Nadu Factories Act 1948 & Tamilnadu Factory Rules 1950.

With Reference to the above and in line with compliance of Tamilnadu CIAMH rules and Manufacture, Storage, and import of Hazardous chemicals rules, we have conducted External Safety Audit for the year 2022 for our factory by engaging an approved Third-Party consultant. Hereby we submit four copies of safety audit reports for your kind perusal and records.

With Regards,

Yours sincerely

For Coromandel International limited

S. Ramesh

Sr.GM – Manufacturing (Unit Head)

சென்னை தொழிலகப் பாதுகாப்பு மற்றும்
சுகா: நார இயக்குநர் அலுவலகத்தில் உறைகள்
(உள்ளே உள்ளது என்னவென்று தெரியாது)
பெற்றுக் கொள்ளப்பட்டது
நாள் 02.02.23 நேரம்

தபால்தலைவர் எழுத்தர்

Enclosure: Four copies of Safety Audit report 2022

Cc to: Joint Director of Industrial Safety and Health, Thiruvottiyur (One copy of Report)

OCCUPATIONAL HEALTH AND SAFETY AUDIT REPORT - 2022

CONDUCTED AT

M/s, COROMANDEL INTERNATIONAL LIMITED, - ENNORE UNIT

On

07th DECEMBER 2022

By

SAFETY LINKS
7/275, First street, Lakshmi Nagar,
Nanmangalam, Chennai-600117
Mobile: 9176407275
E.mail: support@safetylinks.in

Annexure IV

Proc of DISH on the Onsite Emergency Preparedness Plan

13/8/22

Manager (SHE)

Read on 13/8/22

PROCEEDINGS OF THE DIRECTOR OF

INDUSTRIAL SAFETY AND HEALTH, (FAC)

CHENNAI

PRESENT: THIRU.K.JAGATHESAN, M.E.,

ABSTRACT

The Factories Act 1948 and the Tamil Nadu Factories Rules 1950 – The Tamil Nadu Control of Industrial Major Accident Hazardous Chemicals Rules 1989 - On Site Emergency Plan of **Coromandel International Limited, Post Box No.2, Express Highway Road, Ennore, Chennai – 600 057 (TVR-738)** – Recorded.

R.Dis H2/24997/2022 Dated:25.07.2022

Read: Letter from Management Dated: 04.07.2022

ORDER:

The Management of **Coromandel International Limited, Post Box No.2, Express Highway Road, Ennore, Chennai – 600 057 (TVR-738)** has prepared an 'On-Site Emergency preparedness plan' pertaining to their factory and submitted to this office.

Taking into consideration of the information furnished by the management in the 'On-Site Emergency Plan' and in exercise of the power conferred under section 41 B (4) of the factories Act 1948 and the Rule 13 (1) of Tamil Nadu control of Industrial major Accident hazardous chemicals Rules 1989 (as amended in 1994 and 2000) the Director of Industrial Safety and Health, Chennai hereby records the On-Site Emergency preparedness plan of the above said factory subject to the following conditions:

1. The On-Site Emergency Plan submitted by the management is recorded only for the conditions prevailing on the date of receipt of the On-Site Emergency Plan.
2. If there is any change in the layout of machinery, plant, process or any other modification are carried out a fresh On-Site Emergency Plan in accordance of such modifications should be prepared and submitted again for approval.

3. Full Scale On-Site Emergency mock drill should be conducted once in 6 months, involving the officials from the Directorate of Industrial Safety and Health, Fire and Rescue services department, Medical Department, Pollution Control Board and the adequacy of the emergency response measures, shall be assessed and the outcome of the mock drill shall be periodically reported to the Director office.
4. Site Plan showing the following locations legibly shall be enclosed in the On Site Emergency Plan.
    i. Location of entry/exit
    ii. Location of Emergency Control Centre
    iii. Location of Assembly Point
    iv. Location of Emergency exit
    v. Location of Hazardous Substance Storage area.
    vi. Location of Wind Sock
    vii. Location of Occupational Health Centre
    viii. Emergency escape route
5. A copy of On Site Emergency Plan, Topo sketch, plan showing emergency escape route, a set of self contained breathing apparatus shall be made available in the Emergency Control Centre.
6. Storage of chemicals and intermediate products which are highly reactive or explosive shall be limited to the quantities required for two months use.
7. All parts of plant, equipment, machinery which in the likely event of failure may give rise to an emergent situation shall be examined thoroughly.
8. Suitable alarm and effective alarm systems giving audible and visible indications shall be installed at the control room as well as in all strategic locations.
9. All workers exposed to the hazards in the processes shall be provided with appropriate and approved type of personal protective equipment.
10. Adequate ventilation arrangements shall be provided and maintained at all times in the process area where dangerous or toxic or flammable or explosive substances could be evolved.
11. Maintenance activity shall be carried out periodically after issuing permit to work to avoid leakage of ammonia from the reactor.

12. Adequate fire fighting facility shall be provided near sulphur storage area.
13. Cautionary notices in a language understood by the majority of workers shall be prominently displayed in all hazardous areas drawing the attention of all workers about the hazards to health,
14. A log of all entry in to or work is, confined spaces shall be maintained and such record shall contain the details of persons assigned for the work, the location of the work and such other details regarding safety and health of the persons assigned for the work.

(S/d.K.Jagathesan)
Director (FAC),
Industrial Safety and Health,
Chennai-32.

To
The Occupier,
Coromandel International Limited,
Post Box No.2, Express Highway Road,
Ennore,
Chennai – 600 057.

Copy to:
1.The Joint Director, Industrial Safety & Health, Thiruvottiyur.
(He is requested to monitor the compliance of the conditions by the Management during his regular inspection.)
2. Additional Director, Industrial Safety & Health, Chennai.
3. Spare Copy
4. Stock File

//Forwarded by Order//

27/07/22
for Director (FAC),
Industrial Safety and Health,
Chennai –32.

27/07/2022.

Annexure V

MSDS of Ammonia

SAFETY DATA SHEET

1. CHEMICAL IDENTITY

Chemical Name : AMMONIA
Chemical Classification : ALKALI
Synonyms : ANHYDROUS AMMONIA
Trade Name : ANHYDROUS AMMONIA

Formula : NH_3 C.A.S. No.: 7664-41-7 U.N.No.: 1005

Regulated Identification: 1005 Shipping Name : An hydrous ammonia
Hazchem Code: 2PE ,TDG class 2.4 : corrosive gas
Codes / Label : Flammable Class - 2
Hazardous Waste ID No.: TDG class 9.2

HAZARDOUS INGREDIENTS: **C.A.S. No.** 7664-41-7
1. Ammonia 99.5%

2. PHYSICAL / CHEMICAL DATA:

Boiling Range / Point : (-) 33.30°C Physical state : Gas
Appearance : Colorless. Vapour Pressure @ 20°C, mmHg: 6610
Odour : Strongly pungent
Melting/ Freezing Pt : (-)77.7°C
Vapour Density : 0.597 @32°F Others : N.A.V
(Air = 1) Solubility in water at 30°C: Floats and boils on water, Soluble.

Specific Gravity: 0.63g/CC pH :12 (10 % Solun. Water)
(Water = 1) Liquid.

3. FIRE / EXPLOSION HAZARD DATA:

Flammability Yes : LEL 15.5% : Flash Point °C N.A.V.
TDG Flammability : UEL 27.0% : Flash Point °C N.A.V.

Autoignition Temperature °C : 651
Explosion sensitivity to impact : N.A.V

Explosion sensitivity to static electricity : N.A.V
Hazardous Combustion Products : Not pertinent
Hazardous Polymerization : Not pertinent
Combustible Liquid : YES Explosive material: Readily
Flammable Material : Yes Class 2 combines with silver oxide or mercury, chlorine, iodine, bromine, calcium and hydro chlorite to form explosive compound.
Oxidiser : N.A.V
Pyrophoric Material : N.A.V Organic peroxide: N.A.V.
Others : N.A.V
Corrosive material : corrosive to copper and galvanized surfaces

4. REACTIVITY DATA:

Chemical stability : Stable

Incompatibility with other material: Corrosive to copper and galvanized surfaces.

Reactivity : With water dissolves with mild heat effect.
Hazardous : yes
Reaction Products : With common materials.

5. HEALTH HAZARD DATA:

Routes of entry : Through eyes, nose and throat.
Effects of Exposure / : Vapour – Poisonous if inhaled, irritation to eyes, nose, throat.
Symptoms : 700 ppm causes eye irritation and permanent injury if prompt medical health care not taken.
5000 ppm causes immediate death from spasm, inflammation or Edema of the laynx.
400 ppm causes immediate nose and throat irritation.

Emergency Treatment: N.A.V.

LD_{50} (oral-rat mg/kg : STEL 37 ppm 27.0 mg/m^3

	Ppm mg/m^3 : Odour Threshold 4.7 ppm mg/m^3
TLV (ACGIH)	25 ppm 18 mg/ m^3

NFPA Hazard	Health	Flammability	Reactivity
Special Signals	Blue 2.3	Red 1.1	Yellow 0.0

6. PREVENTIVE MEASURES

Personal Protective Equipment:
Use rubber boots/gloves, face shield/safety goggles.
Use self contain breathing apparatus/gas mask. Use full body protection in case of liquid Ammonia.

Handling & Storage Precautions :
Store out of contact with oxidizing material, away from all source of ignition.

7. EMERGENCY / FIRST AID MEASURES:

In case of contact immediately wash the affected area with water. Remove contaminated clothing.

FIRE : Stop flow of gas. Use water spray or fog.
FIRE EXTINGUISHING: Not to be used.
Media

Special Procedure : Keep exposed containers cool.
Heat expose tanks can explode.
Unusual Hazards : N.A.V

EXPOSURE : First Aid Measures: Immediately flush skin with water. Remove contaminated clothes at once. If irritation eyes for 15 minutes with copious amounts of water. Remove to fresh air. Contact Doctor immediately.

Antidotes / Dosages: In case of swallowing of liquid ammonia if patient is conscious, he should drink large quantities of water.

SPILLS : Steps to be taken: Dilute spillage with plenty of water and flush.

Waste Disposal Method : N.A.V

8. ADDITIONAL INFORMATION / REFERENCES:

Vapour lighter than air. Stay up wind. Evacuate area using breathing apparatus.

9. MANUFACTURERS / SUPPLIERS DATA:

NAME OF FIRM : Mitsui Corp. Ltd. Contact person
MAILING ADDRESS: C.P.O Box-822, TOKYOJapan in Emergency : N.A.V
TELEPHONE / TELEX NOS: N.A.V
TELEGRAPHIC ADDRESS: N.A.V
Local Bodies involved : Fire brigade, Police.

Standard Packing : N.A
Trem Card Details / Ref : N.A.V
Other : N.A.V

10. DISCLAIMER:

The information is given as guidance for handling theemergencies.

N.A = NOT APPLICABLE.

N.A.V. = NOT AVAILABLE.

END

Annexure VI

SOP for pre-cooling and ship unloading

Coromandel FUTURE POSITIVE	COROMANDEL INTERNATIONAL LIMITED	Doc. No. : PSMS/SOP/AT03 Rev. No. : 00 Date : 01.04.2022 Page : 1 of 6	murugappa
	PSM STANDARD OPERATING PROCEDURE		
Unit: ENNORE	PRE-COOLING AND SHIP UNLOADING PREPARATIONS		**Plant: Ammonia Terminal**

1.0 Purpose:

To prepare for pre-cooling and ship unloading operations.

2.0 Scope:

This procedure covers all steps to be taken prior to starting pre-cooling and ammonia ship unloading operation.

3.0 Abbreviations:

- TIC: Temperature Indication Control
- APS: Ammonium Phosphate Sulphate
- XV: On Off valve
- PCV: Pressure Control Valve
- VFD: Variable Frequency Drive
- ESD: Emergency Shutdown
- HIC: Hand Indication Control
- MCC: Main Control Center
- DCS: Distributed Control System
- ARC: Auto Recycle Control
- CT: Cooling Tower

4.0 Safety and Health considerations:

4.0.1 Properties and hazards of Ammonia.

Sl. No.	PROPERTY	PARAMETER
1	Normal boiling point	-33.4°C
2	Critical temperature	132.40^0C
3	Critical pressure	112.8 bar
4	Freezing point	- 77.7^0C.
5	Latent heat of vaporization at 1 atm and -33^0C	1370.76 KJ/Kg.
6	Explosive limits	16 to 25% v/v.
7	Auto-Ignition temperature	651^0C
8	Threshold limit value (TLV) - TWA (Time Weighted Average) for 8 hours.	25ppm
9	STEL (Short Term Exposure Limit, for 15 minutes).	35ppm

4.0.2 Respiratory PPE to be used for Ammonia Handling:

Sl. No	Chemical	Health Hazard Data	Preventive Measures (PPE to be used)	First Aid
1.	Ammonia	Inhalation	1. Ammonia canister mask. 2. Self-contained breathing apparatus.	Remove the victim to fresh air area and provide artificial respiration or Oxygen, if necessary.
2.	Ammonia	Skin and Eyes	1. Ammonia canister mask. 2. Self-contained breathing apparatus	Wash the affected area for 15min. with plenty of water. Seek medical aid immediately.

4.0.3 Emergency Measures for Ammonia:

Sl. No	Condition	Emergency Measures
1	Fire	1. Stop flow of gas 2. Use water spray or fog
2	Spills	1. Contain the spillage on sand or earth, allow to evaporate. 2. Dilute the vapors with plenty of water.

4.0.4 Safety system and their functions for Ammonia

4.0.4.1 Relief valves are provided in the loop at upstream and downstream of control valves as per the below table:

Sl. No.	Tag. No.	LOCATION	SET PRESSURE Kg/cm^2	Basis for setting
1	**SV-10112**	Pre-cooling pump P1002A immediate discharge.	22.50	To avoid line pressurizing beyond design
2	**SV-10113**	Pre-cooling pump P1002B immediate discharge.	22.50	To avoid line pressurizing beyond design
3	**SV-10114**	Both pre-cooling pumps common discharge SRV	22.50	To avoid line pressurizing beyond design
4	**SV-10106**	NKT north line SRV	22.50	To avoid line pressurizing beyond design
5	**SV-10116**	NKT south line SRV	22.50	To avoid line pressurizing beyond design

6	**SV-10103**	14" line horizontal line SRV	22.50	To avoid line pressurizing beyond design
7	**SV-10104**	14" vertical line SRV	22.50	To avoid line pressurizing beyond design

4.0.4.2 Operating Limits/ Parameters

S. No.	Tag No.	DISCRIPTION	Parameter
1.	PI-10141	NKT 14" line pressure	2 - 2.2 kg/cm^2
2.	PI-10143	NKT pre-cooling line pressure	$^{2.0}$ – 5.0 kg/cm^2

4.0.4.3 Ammonia Sensors:

Ammonia sensor AI-10102 is provided at ammonia pumps area.

Ammonia sensors indications given on DCS as well as in field.
All the sensors are provided with High Alarm @ 5 ppm & High High Alarm @ 10 ppm.

4.0.4.4 Water sprinkling system:
FH water sprinkler system is provided in ammonia pumps area to contain any release of Ammonia.
Sprinklers will be operated manually based on requirement.

5.0 Procedure:

5.0.1 Precooling operation preparation:

Step No.	Procedural Step	Responsibility	Signature
1.	**START** both the pre-cooling pumps through ARC for 15 min and ensure pump performance is good.	Panel Operator Field Operator	
2.	**ENSURE** AT Instrument air compressor availability	Panel Operator	
3.	**ENSURE** All Ammonia condenser tubes are cleaned.	Panel Operator Field Operator	
4.	**ENSURE** all Ammonia compressors lube oil coolers tubes are cleaned.	Panel Operator	
5.	**ENSURE** all ship unloading interlocks are working.	Panel Operator	
6.	**ENSURE** Healthiness of all motor starter and terminals	Panel Operator Electrical Operator	
7.	**ENSURE** Emergency vehicle availability for Ship unloading purpose	Plant in charge	
8.	**ENSURE** availability of LPG Cylinders (50 full cylinders).	Plant in charge	
9.	**ENSURE** availability of N2 Cylinders (4 full cylinders).	Plant in charge	

Coromandel FUTURE POSITIVE	COROMANDEL INTERNATIONAL LIMITED PSM STANDARD OPERATING PROCEDURE	**Doc. No. : PSMS/SOP/AT03** **Rev. No. : 00** **Date : 01.04.2022** **Page : 4 of 6**	murugappa
Unit: ENNORE	PRE-COOLING AND SHIP UNLOADING PREPARATIONS		**Plant: Ammonia Terminal**

Step No.	Procedural Step	Responsibility	Signature
10.	**ENSURE** availability of Diesel Drums (4 full drums).	Plant in charge	
11.	**ENSURE** availability of 750 KVA DG Set in Auto mode and rental DG operator availability	Plant in charge Panel Operator	
12.	**ENSURE** availability of Flare System and record the performance.	Panel Operator	
13.	**ENSURE** LPG regulator and hoses are in good condition	Field Operator	
14.	**ENSURE** Fire Hydrant System and Spray curtain	Panel Operator Field Operator	
15.	**ENSURE** all CT pumps suction filter are cleaned and record the performance (amps).	Panel Operator Field Operator	
16.	**CLEAN** FRP CT strainer.	Panel Operator Field Operator	
17.	**ENSURE** CT fans drive belts and maintain spare belts in control room.	Plant in charge Panel Operator	
18.	**ENSURE** healthiness of all ammonia sensors. Before inspection inform to safety department and plant manager	Plant in charge	
19.	**CALIBRATE** all temperature and Pressure gauges (Connecting with ship unloading).	Plant in charge	
20.	**ENSURE** tank SRV/VRV is in good condition.	Field Operator	
21.	**ENSURE** Availability of NH3 cartridge masks. (Total 10 No's).	Field Operator	
22.	**ENSURE** availability of SCBA (4 NO's) and Liquid Ammonia Full Suit 3 nos. Ensure Air cylinder pressure is not less than 200 bars.	Panel Operator	
23.	**ENSURE** water stock in the plant.	Plant In charge	
24.	**ENSURE** availability of EB Power (3.3KV) without interruption during precooling and ship unloading	Panel Operator	
25.	**ENSURE** availability of all utilities (Instrument air, Drinking water).	Panel Operator	
26.	**ENSURE** Walkie-talkies are in charged condition.	Panel Operator	
27.	**CHECK** the functioning of all safety showers and eye wash sprayers.	Field Operator	
28.	**ENSURE** the availability of all ship U/L compressors	Panel Operator	

5.0.2 EMERGENCY OPERATION/SHUTDOWN

1.IN CASE OF EXPORT LINE LEAK

Step No.	Procedural Step	Responsibility	Signature
1.0	**STOP** the Ammonia Transfer pump from DCS immediately in case of APS export line leak. (OR) CLOSE the tank outlet valve XV-10102 in DCS	Panel Operator Field Operator	

Step No.	Procedural Step	Responsibility	Signature
	(OR) PUSH the ESD switch for XV-10102 (OR) PUSH the ESD switch for XV-10102 in local panel.		

6.0 Interlocks / Trips associated with this procedure

The following interlocks were provided to take care of ammonia pumps while running.

If any interlocks need to be bypassed as part of the startup, it should be mentioned in relevant step and also when should be brought back in line and who is authorized to do this (Shift in Charge or Plant Manager)
If there is any process safety consequence of not doing a step, then it must be written at appropriate step

No.	TAG No.	DESCRIPTION	SETTING	ACTION	BASIS FOR SETTING
1	LI-10101	Ammonia Tank Level (Enraf LT)	19.57 M	At high level tank inlet valve XV-10101 and HIC-10101 will close.	To avoid ammonia Overflow to annulus.
2	PIT-10101 PIT-10102 PIT-10103	Ammonia Tank Pressure	Any two pressure (P2oo3) reaches 860 mmWC	Tank inlet valve XV-10101 and HIC-10101 will close.	To avoid tank top SRV popup.
3	PIT-10101 PIT-10102 PIT-10103	Ammonia Tank Pressure	Any two pressure (P2oo3) reaches 100 mmWC	Tank outlet valve XV-10102 and running compressor will trip.	To avoid vacuum inside the tank.
4	750kva DG set	AT Diesel Generator set	Auto mode	Auto start of DG set whenever EB power failure.	To start LT compressor in order to maintain tank pressure.
5	XV-10211 XSOV-10211 PV-10211 PSOV-10211	Receiver pressure control valve	18.5 kg/cm2	Receiver, Condenser vent control valve opens when the first compressor starts and closes when the last compressor stops.	To vent NCG accumulation in the receiver.

Coromandel FUTURE POSITIVE	COROMANDEL INTERNATIONAL LIMITED PSM STANDARD OPERATING PROCEDURE	**Doc. No. : PSMS/SOP/AT03** **Rev. No. : 00** **Date : 01.04.2022** **Page : 6 of 6**	murugappa
Unit: ENNORE	PRE-COOLING AND SHIP UNLOADING PREPARATIONS		**Plant: Ammonia Terminal**

7.0 Amendment / Records:

Rev No	Date of Amendment	Description of Amendment	Reason for Amendment
**	**	**	**

8.0 MSDS: PSMS/MSDS/001/Rev0.

9.0 Relief valves: PSMS/RS/003/Rev2.

*****End of the Procedure*****

Annexure VII

Monitoring of Ammonia in the Ambient Air

Results of ambient air quality measurement of Ammonia in the following location using handheld meter:

Sl. No.	Location Name	Ammonia(in ppm)			
		27.12.2023	28.12.2023	29.12.2023	30.12.2023
1	Near Ammonia pipeline leak identified area	3 ppm at 3.51 AM	0 ppm at 01.59 PM	0 ppm at 11.21 AM	0 ppm at 01.04 PM
2	At Thazhankuppam village	0 ppm at 4.02 AM	0 ppm at 01.56 PM	0 ppm at 11.19 AM	0 ppm at 01.11 PM
3	At Periyakuppam village	0 ppm at 4.09 AM	0 ppm at 02.48 PM	0 ppm at 11.25 AM	0 ppm at 01.45 PM
4	At Chinnakuppam village:	0 ppm at 4.12 AM	0 ppm at 02.46 PM	0 ppm at 11.24 AM	0 ppm at 01.43 PM
5	At Ernavoorkuppam village:	0 ppm at 4.15 AM	0 ppm at 02.38 PM	0 ppm at 11.27 AM	0 ppm at 01.40 PM
6	At Kathivakkam Railway bridge:	0 ppm at 4.17 AM	0 ppm at 02.36 PM	0 ppm at 11.29 AM	0 ppm at 01.37 PM
7	At Ennore near Gulf Oil Gate	0 ppm at 4.20 AM	0 ppm at 02.13 PM	0 ppm at 10.37 AM	0 ppm at 01.22 PM
8	At Ennore bus depot	0 ppm at 4.24 AM	0 ppm at 1.21 PM	0 ppm at 10.40 AM	0 ppm at 01.19 PM
Standard for Ammonia in the ambient air 24 Hrs Avg. 0.57 ppm (400µg/m^3)					

Annexure VIII

Ammonia level monitored Continuous Ambient Air Quality Monitoring (CAAQM) Station at Kathivakkam

Ammonia measured in the Ambient Air CAAQM station at Kathivakkam located at a distance of 1 KM from the unit from 26.12.2023 to 27.12.2023 is as follows:

Date& Time	NH_3 (µg/m^3)	NH_3 (ppm)
26-12-2023 07:00	2.97	0.004232
26-12-2023 08:00	3.24	0.004617
26-12-2023 09:00	4.2	0.005985
26-12-2023 10:00	4.01	0.005714
26-12-2023 11:00	3.87	0.005515
26-12-2023 12:00	3.92	0.005586
26-12-2023 13:00	4.66	0.006641
26-12-2023 14:00	3.15	0.004489
26-12-2023 15:00	2.66	0.003791
26-12-2023 16:00	2.08	0.002964
26-12-2023 17:00	2.29	0.003263
26-12-2023 18:00	2.66	0.003791
26-12-2023 19:00	3.08	0.004389
26-12-2023 20:00	3.02	0.004304
26-12-2023 21:00	3.29	0.004688
26-12-2023 22:00	2.74	0.003905
26-12-2023 23:00	2.52	0.003591
26-12-2023 24:00	12.23	0.017428
27-12-2023 01:00	25.23	0.035953
27-12-2023 02:00	42.51	0.060577
27-12-2023 03:00	47.99	0.068386
27-12-2023 04:00	16.19	0.023071
27-12-2023 05:00	9.25	0.013181
27-12-2023 06:00	8.1	0.011543
27-12-2023 07:00	9.21	0.013124
27-12-2023 08:00	4.34	0.006185
27-12-2023 09:00	4.46	0.006356
27-12-2023 10:00	4.18	0.005957
27-12-2023 11:00	8.67	0.012355
27-12-2023 12:00	3.43	0.004888
27-12-2023 13:00	2.55	0.003634
27-12-2023 14:00	4.99	0.007111

27-12-2023 15:00	1.25	0.001781
27-12-2023 16:00	0.1	0.000143
27-12-2023 17:00	5.94	0.008465
27-12-2023 18:00	7.09	0.010103
27-12-2023 19:00	5.75	0.008194
27-12-2023 20:00	4.05	0.005771
27-12-2023 21:00	3.89	0.005543
27-12-2023 22:00	3.81	0.005429
27-12-2023 23:00	4.26	0.006071
27-12-2023 24:00	4.38	0.006242
Standard for Ammonia in the ambient air 24 Hrs Avg. 0.57 ppm (400µg/m^3)		
(1ppm ammonia = 700 µg/m^3), (1 µg/m^3 ammonia = 0.001425 ppm)		

Annexure IX

Ammonia level monitored in the sea water

Measurement of presence of Ammonia in the sea water near Ammonia submarine pipeline (offshore):				
Date	**Time**	**Sample Location**	**Unit**	**Ammonia as NH_3**
27.12.2023	03:49 hrs	Near NKT	mg/l	48
27.12.2023	13:50hrs	Near NKT	mg/l	8.1
28.12.2023	11:29hrs	Near NKT	mg/l	<1
29.12.2023	15:05 hrs	Near NKT	mg/l	<1
30.12.2023	10:00hrs	Near NKT	mg/l	<1
Ammonia standard for the discharge of trade effluent in marine coastal area			**mg/l**	**5**

Annexure X

Ammonia pipeline damage assessment and repair plan submitted by Coromandel International Limited – Ennore

Phase- 1: Preparatory Job

Additional fencing of the leak suspected corridor area will be done through M/s Itajai Marine and Corridor pile strength will be assessed by M/s Itajai Marine. Gantry crane with 2 ton lifting capacity will be arranged above the pile structure and all boulders and debris in the vicinity of ammonia pipeline will be cleared up to the end of last pile structure with help of cargo lifting nets and crane by M/s Itajai Marine. Coffer dam arrangements will be provided around the structure with Geo bags filled with sand and MS sheets and Water shoring will be carried out continuously inside the coffer dam till the complete inspection of leaky line by M/s Itajai Marine.

Physical inspection of pipeline will be done for any damage by M/s Coromandel & M/s Itajai Marine and wrapping of the identified damage portion for temporary testing and further planning by M/s Itajai Marine.

Phase – 2: Draining

Draining of hold up aqueous ammonia in the pipeline and Nitrogen purging will be done in the water bath to contain ammonia release by M/s Coromandel with all safety precautionary measures. Gas analysis will be done periodically to ensure the reduction of water traces inside the pipe line by M/s Coromandel. The recovered ammoniacal water will be safely stored and consumed in the fertilizer plant by M/s Coromandel if complex plant was operated. Otherwise, storage of aqueous ammonia & preservation procedure to be arrived separately, after discussions with subject matter experts.

Phase – 3: Inspection and Repair Procedure

Pipeline will be pressure tested using Nitrogen after attending the visible suspected location temporarily for further actions by M/s Coromandel& M/s Itajai Marine. During pressure test, underwater visual inspection will be done by M/s Coromandel & M/s Itajai Marine to assess the line for any further abnormalities.

Repair procedure and method statement finalization based on inspection by M/s Coromandel and M/s NOV (National Oilwell Varco), Denmark. (Original Equipment Manufacturer).

TAMIL NADU POLLUTION CONTROL BOARD

Proceedings No. T1/TNPCB/F.0101 AMB/RL/W&A/2023dated:27.12.2023

Sub: TNPCB – Industries –1) **M/s. Coromandel International Limited - Ammonia Storage Terminal Facility, S.F.No. 247, Kathivakkam Village, Thiruvottiyur Taluk, Chennai District**and 2) **M/s. Coromandel International Limited, located at S.F.No. 37/B2, 38/5A, 39/B1, 39/6A, 246/2,3,4,5,6,7 & 247/1A,2A,3C,3A, Ernavoor Village, Thiruvottiyur Taluk, Chennai District** – Ammonia leak in the offshore pipeline from Port to Storage Tank - Directions under Section 33A of the Water (Prevention and Control of Pollution) Act, 1974 as amended and Section 31A of the Air (Prevention and Control of Pollution) Act, 1981 as amended – To suspend the operation of Ammonia offshore pipeline activity for precooling and ammonia transfer immediately - Issued - Regarding.

Ref:
1. Proc No. T1/TNPCB/F0101AMB/RL/AMB/W&A/2023 dated: 20/10/2023
2. Proc No. F0102 AMB/RL/JCEE–M/TNPCB/AMB/W&A/2023 dt. 12/05/2023
3. Lr.No. JCEE(M)/TNPCB/CHN.ZONE/AT/2023 Dated: 27.12.2023

****

Whereas, the unit of M/s Coromandel International Ltd., Ennore is a fertilizer manufacturing facility and involved in the manufacture of Ammonium Phosphate Potash Sulphate (APPS) -4 lakhs Tonnes /Annum. Ammonia is one of the raw materials for the manufacture of APPS. The unit has provided a double insulated ammonium storage tank of 12500 T capacity. The unit has obtained separate CTOs for APPS manufacturing and ammonia storage in the reference 1st and 2nd cited respectively subject to certain conditions.

Whereas, Ammonia is received via Ennore minor port through ships and transferred from there using 8" flexible HDPE pipeline of 2.5 km length laid underneath the seabed. The depth of pipeline from the sea surface varies from 1' near the shore to 18' at the mooring point at port. The unit receives and unloads ammonia of 3000 to 8000 T once a month. Ammonia is generally imported from Iran or Saudi Arabia. Ammonia is received in liquid form at -33°C and stored in the storage tank under the same condition. The pipelines are generally maintained at 2 Kg/cm2 vapour pressure when no transfer of ammonia takes place. 36 hours prior to the transfer of ammonia from the ship, pre-cooling process of pipeline is carried out for pumping ammonia in liquid condition. The unit carries out the pre-cooling and ammonia transfer operation only after getting the permission from Tamil Nadu Maritime Board.

No. 76, MOUNT SALAI, GUINDY, CHENNAI - 600 032.
Tel : 044-22353134 - 139 Fax : 044-22353068
Email : tnpcb-chn@gov.in Web : tnpcb.gov.in

Whereas, a phone message was received from the unit at 12.45 am on 27.12.2023 regarding the ammonia gas leakage happened during the pre-cooling operation of the pipeline. Immediately the JCEE (M) Chennai along with DEE (Ambattur) and AEE (Manali) reached the site by 2.15 am and inspected the unit &the pipeline locations. The Joint Director, DISH who is the authority for the safety of the industrial operation was also present at the site.

Whereas, during inspection by the TNPCB officials, the unit has reported the following:

- The unit observed pressure drop in the pipeline at around 11.45 pm and simultaneously observed pungent odour around the storage terminal and near the material gate. The unit also immediately visited the pipeline location across the road and observed gas bubbles coming out of the pipeline at about 2 feet from the shore. The unit immediately started depressurising the pipeline by diverting the ammonia vapour to the flare and completed the operation within 20 minutes. The wind direction during the incident was observed to be West South West.
- The unit monitored the ammonia level in the ambient air near the material gate using hand held monitor and found that the ammonia level was 28 ppm during the incident.
- The unit also received information from the local Assistant Commissioner of Police regarding the complaints received from the public on ammonia odour from Periakuppam, Chinnakuppam and few other villages.
- Police and the District Administration along with the unit arranged ambulances and public transport for managing any emergency situation. Some people also received first aid due to eye irritation and breathing difficulties.

Whereas, during inspection by the TNPCB team, the following were observed.

- The ammonia level in the Ambient Air was monitored using handheld ammonia portable meter and found to be 3 ppm as against the standard of 0.57 ppm * 24 hrs average at 3.30 am near the Material gate. The ammonia level in the ambient air was also monitored in the following places.
    a. Near Ammonia pipeline leak identified area : 3 ppm at 3.51 am
    b. At Thalankuppam village: 0 ppm at 4.02 am
    c. At Periakuppam village: 0 ppm 4.09am
    d. At Chinnakuppam village: 0 ppm 4.12 am
    e. At Ernavurkuppam village: 0 ppm 4.15 am
    f. At Kathivakkam Railway bridge: 0 ppm 4.17 am
    g. At Ennore near Gulf Oil Gate: 0 ppm, 4.20 am
    h. At Ennore bus depot: 0 ppm at 4.24 am

- The sea water sample at the point of pipe line leakage was collected at 3. 49 am and the ammonia level in the sea water was found to be 49 mg/L (Marine discharge standard of 5 mg/L). At 4.30 am, mild ammonia odour was observed near the site and the Chinnakuppam & Periyakuppam villages.
- The unit has stopped the operation of APPS Plant. The unit has reduced the production of Sulphuric Acid Plant and operating the same under low capacity.
- The unit has informed that they will identify the exact location and the extent of pipeline damage within a day and will rectify the same before commencing the ammonia transfer. The unit has been instructed to carryout the above activity at war footing and to put the pipeline in operation only with the concurrence of competent authority i.e., Tamil Nadu Maritime Board.

Whereas, the JCEE(M), Chennai has recommended for the issue of certain directions under Water (Prevention & Control of Pollution) Act, 1974 as amended in 1988 and Air (Prevention and Control of Pollution) Act, 1981 as amended

Whereas, the Board has decided to issue directions under the Water (Prevention & Control of Pollution) Act, 1974 as amended in 1988 and Air (Prevention and Control of Pollution) Act, 1981 as amended to comply with certain conditions.

Therefore, in exercise of powers conferred under section 33 A of the Water (Prevention and Control of Pollution) Act 1974, as amended and Section 31A of the Air (Prevention and Control of Pollution) Act, 1981 as amended, the Board issues the following directions to the units1) **M/s. Coromandel International Limited - Ammonia Storage Terminal Facility, S.F.No. 247, Kathivakkam Village, Thiruvottiyur Taluk, Chennai District** and 2) **M/s. Coromandel International Limited, located at S.F.No. 37/B2, 38/5A, 39/B1, 39/6A, 246/2,3,4,5,6,7 & 247/1A,2A,3C,3A, Ernavoor Village, Thiruvottiyur Taluk, Chennai District** so as to comply with the following and the action taken in this regard shall be furnished to the Board within two days time.

1. The unit shall suspend the operation of Ammonia offshore pipeline activity for precooling and ammonia transfer immediately and shall resume the same only after obtaining the approval of Indian Register of Shipping (IRS) and the Tamil Nadu Martine Board.
2. The unit shall precisely identify the location and the extent of damage that happened to the offshore pipeline and rectify the same early.
3. The unit shall ensure that no ammonia leak occurs during the pipeline rectification operation.

4. The unit shall restart the APPS plant and other allied units only after ensuring that all the ammonia pipeline inside the plant are intact and safe and shall obtain NOC from DISH before restarting the plant.

Failure to comply with the above said directions will attract action in accordance with the provisions of the Water (Prevention and Control of Pollution) Act, 1974 as amended and Air (Prevention and Control of Pollution) Act, 1981 as amended.

The receipt of this proceeding shall be acknowledged.

27/12/23

For Chairperson

29/12/2023

To

1. The Managing Director,
   M/s. COROMANDEL INTERNATIONAL LIMITED
   S.F No.37/B2,38/5A,39/B1,39/6A,246/2,3,4,5,6,7,247/(part)1A,2A,3C,3A,
   Ernavoor Village, Thiruvottiyur Taluk,
   Chennai District.

2. The Managing Director,
   M/s. COROMANDEL INTERNATIONAL LIMITED - AMMONIA STORAGE TERMINAL FACILITY,
   S.F.No. 247, Kathivakkam Village,
   Thiruvottiyur Taluk , Chennai District

Copy To

1. The Joint Chief Environmental Engineer (Monitoring),
   Tamilnadu Pollution Control Board
   Chennai Region.

2. The District Environmental Engineer
   Tamilnadu Pollution Control Board
   Ambattur - **For follow up action and furnish report to Board**

3. File

Through E.Mail

Environment, Climate Change and Forest (EC.4) Department, Secretariat, Chennai – 600 009.
Phone: 044-25665508
E-mail :eccfd@tn.gov.in

Letter No. 6390662/EC.4/2023-3, Dated:02.02.2024

From
Tmt. Supriya Sahu, I.A.S.,
Additional Chief Secretary to Government.

To
The Chairperson
Tamil Nadu Pollution Control Board
76, Mount Salai, Guindy
Chennai – 600 032.

Madam,

Sub : Environment, Climate Change – Ammonia gas leak in M/s. Coromandel International Limited on 26.12.2023 Recommendations of the Technical Committee on the ammonia gas leak that occurred in M/s. Coromandel International Limited, Ennore on 26.12.2023 – Regarding

Ref: 1. Government letter No.6390662/EC.4/2023-1, Dated.29.12.2023.
2. From the Chairperson, Tamil Nadu Pollution Control Board, Letter No.T1/TNPCB/ F.0101AMB/ RL/2024, dated. 11.01.2024.

I am directed to invite attention to the references cited and to state that the Government has accepted all recommendations of the Technical Committee as submitted to the Government vide reference 2nd above on the ammonia gas leak that occurred in M/s. Coromandel International Limited, Ennore on 26.12.2023.

2. The Tamil Nadu Pollution Control Board is directed to implement all recommendations of the Technical Committee and report compliance.

Yours faithfully,

for Additional Chief Secretary to Government

BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL SOUTHERN ZONE, CHENNAI.

Original Application No. 195 of 2023

Tribunal on its own motion – SUO MOTU based on the News item published on27.12.2023 regarding "Ammonia gas leak from fertiliser manufacturing unit triggers panic in Chennai's Ennore**"**

Vs

1. The Principal Secretary to Govt.of Tamil Nadu,
   Health and Family Welfare Department,
   Govt. Secretariat, Fort St.George,
   Chennai – 600 009.
   & 6 Others

…Respondents

REPORT FILED ON BEHALF OF THE 3RD RESPONDNET – TAMIL NADU POLLUTION CONTROL BOARD

Advocate for Respondent:TNPCB
Thiru.S. Sai Sathya Jith,
Advocate, Chennai.

Date:05.02.2024.

Date of hearing on:06.02A.2024