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Cochin Port Authority

COCHIN PORT AUTHORITY

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No. D3/MULT O&M/Three years/2025-M Dated:26.11.2025

NOTICE INVITING BUDGETARY OFFER

Budgetary offers are invited through E-mail and published through Cochin Port web site and CPP Portal by the Chief Mechanical Engineer, Cochin Port Authority, from reputed firms for "Manning, Operation, Maintenance and Repairs of Facilities and Services provided at the MULT Terminal at Cochin Port for a period of three years extendable by one more year at the discretion of Cochin Port Authority". Bidders are requested to submit their Budgetary offers based on the Conditions of Contract and Scope of Work given below as per the BOQ attached on or before 11.12.2025. E-mail cme@cochinport.gov.in ajithkumar@cochinport.gov.in, karthikeyan.ci@cochinport.gov.in, and mathew.varghese@cochinport.gov.in

A. Introduction:

Multi-User Liquid Terminal (MULT) has been constructed at Cochin Port in Puthuvypeen, based on a Concession Agreement dated 04.04.2014 between Cochin Port Authority (CoPA) and M/s. Indian Oil Corporation Limited (IOCL). The Terminal consists of two Jetties viz. MULT Jetty (for handling LPG and POL cargo) and Barge Jetty (for Bunkers and POL handling) constructed adjacent to the MULT Jetty. MULT Jetty is capable of handling Tankers up to 80,000 DWT. Barge Jetty is capable of handling Barges up to 5000 DWT. A lay out of the MULT Jetty and Barge Jetty is furnished as **Appendix-1.**

Construction works of MULT Terminal were completed in September, 2018. MULT Jetty consists of LPG cargo handling facility (viz. 2 Nos. LPG Loading / Unloading Arms and related Safety Control Systems, LPG Pipelines to the Booster area etc.) and POL Pipelines to Manifold No.1, utility lines etc. whereas Barge Jetty consists of POL Pipelines to Manifold No.2, utility lines etc. Non-LPG hydro-carbon (POL) handling facilities at MULT Jetty as well as at Barge Jetty is not expected to be operational in the initial phase since line connectivity / storage facilities are not yet established by the stake holders. Full-fledged Fire fighting system has been installed and commissioned at MULT Terminal as per OISD-156 STD (integrated for LPG and other liquids).

Commercial operation of LPG cargo handling at MULT Terminal has been commenced during September 2023. As per the conditions of Concession Agreement dated 04.04.2014 executed between Cochin Port Authority and M/s. Indian Oil Corporation Limited, Cochin Port Authority is obliged to manage, operate, maintain and repair the Common Facilities and Services provided at the Terminal, in accordance with the provisions of the Concession Agreement on cost sharing basis between M/s. IOCL and CoPA in the ratio of 45:55. CoPA is also obliged for manning, operation and maintenance of Non-LPG Handling Facilities and Services provided, separately at its own risk and cost. As IOCL has engaged CoPA as the Management Contractor thereby entrusting CoPA with the responsibilities of operating and managing the Common Facilities and Services, CoPA propose to invite open tenders for engaging an O&M Contractor as per the Conditions of Contract and Scope of Work given below.

B. Conditions of Contract:

1. Tenure of O&M Contract: Period of O&M Contract shall be initially for three years from the date of commencement of service and the same is extendable for further period of one year at the same quoted rates and terms and conditions, at the discretion of the Employer.

2. Commencement of Service: The O&M Contractor is required to commence the O&M Services within 15 days from the date of issue of Letter of Acceptance by the Employer.

3. The Contractor shall possess valid 'A Class' Electrical Contract License issued by any State / Central licensing authority or the Contractor shall carry out the maintenance of electrical works through a licensed Contractor possessing 'A Class' Electrical Contract License.

4. Insurance:

4.1. The Contractor shall provide in the joint names of the Employer and the Contractor, insurance cover from the start date to the end of the contract period for-

4.1.1. Personal injury or death.

4.2. Policies and certificates for insurance shall be delivered by the Contractor to the Engineer in Charge or his nominee for approval before the start date. All such insurances shall provide for compensation to be payable in the types and proportions of currencies required to rectify the loss or damage incurred.

4.3. If the Contractor does not provide any of the policies and certificates required, the Employer may affect the insurance which the Contractor should have provided and recover the premiums the Employer has paid from any payments due to the Contractor or, if no payment is due, the payment of the premiums shall be a debt due.

4.4. Alterations to the terms of insurance shall not be made without the approval of the Engineer in Charge or his nominee.

4.5. Both parties shall comply with all conditions of the insurance policies.

5. The Contractor shall comply with the provisions of the contract and with the care and diligence execute and maintain the works and provide all labor and materials, tools and plants including for measurements and supervision of all works, structural plans and other things of temporary or permanent nature required for such execution and maintenance in so far as the necessity for providing these, is specified or is reasonably inferred from the contract. The Contractor shall take full responsibility for adequacy, suitability and safety of all the works.

6. Terminal operation Timing: The Terminal has to be operated 24 x 7 basis. The Contractor may adhere to the shift timing for his Employees as per Appendix-3. The Contractor has to ensure continuous / uninterrupted operation and maintenance requirement of the Terminal round the clock. The employees performing duties in shifts shall be permitted to leave from the duty place after proper taking over of duties by the personnel of the succeeding shift. In order to ensure proper handing over / taking over of the works, there shall be an overlapping of 10 minutes in the shift arrangements. The contractor shall maintain proper attendance records as per standards.

7. Access Control System: The Contractor has to install an appropriate Access Control System to record the attendance, entry and exit of his employees. All the costs associated with the installation, operation and maintenance of Access Control System shall be borne by the Contractor. Installation of appropriate Access Control System shall be done by the Contractor with the approval of Employer.

8. Availability requirement of Critical Systems**:** O&M Contractor is required to ensure the availability percentage of various systems as shown below during the contract period:

Sl. No.	**Equipment / System**	**Overall availability shall not be less than on monthly basis**	**Other availability requirements on monthly basis, if any**
1	Fire Pumps of 760 m^3/hr. in Tower system, 3 Nos.	90%	100% availability of at least 2 Nos. pumps, should be assured at all times.
2	Fire Pumps of 750 m^3/hr. in Hydrant system,3 Nos.	90%	100% availability of at least 2 Nos. pumps, should be assured at all times.
3	Jockey Pumps of 144 m^3/hr. 2 Nos.	90%	100% availability of at least 1 No. pump, should be assured at all times.
4	Foam transfer pumps of 750 lit/min.@17bar at Fire Pump Room, 2 Nos.	90%	100% availability of at least 1 No. pump, should be assured at all times.
5	Trelleborg Marine System	90%	100% availability during the berthing / un berthing and stay of the Tankers at MULT should be ensured.
6	DG Sets, 2 Nos.	90%	100% availability should be ensured during the power failures.
7	Tower Water Monitors, 2 Nos.	95%	
8	Tower Water Foam Monitors, 2 Nos.	95%	
9	Ground Water Monitors, 2 Nos.	95%	
10	Ground Water Monitors at Barge Jetty, 2 Nos.	95%	
Periodicity of trials of all the above pumps shall be as per the OISD norms (i.e. Twice in a week).			

9. Penalty for non-achievement of minimum required availability of equipments:

9.1. The penalty in case of non-achievement of 100% availability requirements:

Sl. No.	**Equipment/System**	**Availability requirement**	**Penalty for non-achievement of required availability.**
1	Fire Pumps of 760 m^3/hr. in Tower system, 3 Nos.	100% availability of at least 2 Nos. Pumps, should be assured at all times.	Rs. 24,000/- per day or part thereof on prorata basis.
2	Fire Pumps of 750 m^3/hr. in Hydrant system, 3 Nos.	100% availability of at least 2 Nos. Pumps, should be assured at all times.	Rs. 24,000/- per day or part thereof on prorata basis.
3	Jockey Pumps of 144 m^3 / hr., 2 Nos.	100% availability of at least 1 No. Pump, should be assured at all times.	Rs. 12,000/- per day or part thereof on pro rata basis.
4	Foam transfer pumps of 750 lit/min. @ 17 bar at Fire Pump Room, 2 Nos.	100% availability of at least 1 No. Pump, should be assured at all times.	Rs. 12,000/- per day or part thereof on pro rata basis.

5	Trelleborg Marine System	100% availability during the berthing / un berthing and stay of the Tankers at MULT should be ensured.	Rs. 48,000/- per day or part thereof on prorata basis.
6	DG Sets, 2 Nos.	100% availability should be ensured during the power failures	Rs. 24,000/- per day orpart thereof on pro rata basis.

9.2. In case of non-availability / absence of any of the employees as per Appendix-3, a penalty will be imposed @ Rs. 2000/- per shift as applicable for each non-available / absent employee. In order to monitor the attendance, the O&M Contractor is required to furnish the details of attendance of employee taken from the Access Control System.

10. Annual maintenance contract requirements with OEMs for critical equipments:

10.1. The O&M Contractor shall cover the following Critical Systems of the Terminal under AMC with the respective OEMs of the System till the end of the O&M Contract period by the Contractor **at his own cost and risk**, to ensure its availability of not less than 95%.

Sl. No.	System	Nos.
1	DG Set including Diesel Engine, Alternator, PLC and control panels	2
2	Fire Pump Engines	6
3	Fire Pumps and Jockey Pumps	8
4	Foam Pump	2

10.2. The spare parts of AMC required for critical equipment should be purchased by the O&M Contractor through OEM after getting the approval from Competent Authority of CoPA and the amount will be reimbursed by the Employer to the O&M Contractor on production of documentary evidences

10.3. The AMC of Trelleborg Marine System (Complete Set such as Hook release interface with Server, Hook release control station, Weather station, Quick Release Mooring Hook, Display Board, Current & Wave Sensor and Tide Sensor)) will be taken directly by CoPA and its periodical inspection should be coordinated by the O&M Contractor. However, routine preventive maintenance is under the scope of O&M Contractor such as trial run, greasing, Electrical Terminal Checking, periodic cleaning, checking the foot switch etc., and keeping the system in working condition. Any defects noticed in the same shall be informed to the employer for taking action from the Employer side.

10.3.1 In non AMC period of Trelleborg Marine System, the cost incurred if any repair/ replacement of spares other than consumables shall be done by the O&M Contractor and the same shall be reimbursed by the Employer.

10.4. The O&M Contractor shall maintain the minimum quantity of diesel in the diesel storage tanks of equipments as per OISD -156 Standards as follows:

Sl. No.	Equipment	Diesel tank capacity in litres	Minimum quantity of diesel in litres to be maintained as per OISD -156 Standards(
1	Fire Pump 1	480	432
2	Fire Pump 2	480	432
3	Fire Pump 3	480	432
4	Fire Pump 4	750	675
5	Fire Pump 5	750	675

6	Fire Pump 6	750	675
7	Foam Pump 2	75	68
8	DG Set 1	500	450
9	DG Set 2	500	450
	Total	**4765**	**4289**

10.5. The O&M Contractor shall enter into AMCs with the OEMs of respective Systems within 2 months from the date of Employer's LoA issued to the O&M Contractor. The Contractor has to consider the availability requirements mentioned above while framing the terms & conditions of AMC with the OEMs of critical equipments. If any cost incurred towards the maintenance/ servicing/ spares through the OEM of AMC required items shall be carried out by O&M Contractor during above non AMC period of 2 months and shall be reimbursed by the Employer on production of documentary evidences.

11. Electricity: Electricity required for functioning of the Terminal as per the Scope of Work of the Contract will be provided by Cochin Port Authority on its account.

12. Drawings and manuals of the Terminal: Drawings, specification and OEMs manuals of various systems, Drawings of Terminal, buildings, substations, programme for PLCs etc. that are required for performing the Scope of Work of the O&M Contract shall be handed over to the O&M Contractor by the Employer. It is the responsibility of the contractor to keep the above documents in the safe custody with satisfactorily indexed. Photos / videos of important activities performed during the tenure of O&M Contract shall also be preserved by the O&M Contractor for the records of the Employer. Such drawings, manuals, etc. handed over to the O&M Contractor shall continue to be the property of Cochin Port Authority. Confidentiality of such documents shall be maintained by the Contractor except for the scopes under contractual obligations and same shall be returned to Cochin Port Authority on completion of the contract.

13. Tools and tackles, special tools and tackles, testing equip ment, scaffolding etc. required for operation and maintenance shall be arranged by the Contractor at his cost and risk.

14. Cochin Port Authority may conduct inspections / audit of the Terminal to check the health of the Terminal and maintenance and operation standards followed by the Contractor. The Contractor shall provide all necessary assistance / documents for such inspections / audit as desired by Cochin Port Authority.

15. The contractor shall notify Cochin Port Authority promptly regarding the occurrence of any emergency situation and take quick action to prevent any threatened damage, injury or loss to the Terminal or persons or property inside the Terminal.

16. Responsibility to rectify loss or damage:

16.1. If any loss or damage happens to the works / property, or any part thereof due to negligence of the Contractor of which the Contractor is supposed to take care during the period of the contract, the Contractor shall, at his own cost and risk, rectify such loss or damage to the works / property to the satisfaction of the Cochin Port Authority.

16.2. In the event of an emergency where, in the judgment of Cochin Port Authority, delay would cause serious loss or damage, repairs or adjustments may be made by Cochin Port Authority or a third party chosen by Cochin Port Authority by giving advance notice to the contractor and the cost of such works shall be paid by the contractor.

17. Sub-Contracting:

17.1. Except to the extent provided below, the O&M Contractor shall not sub-contract or otherwise engage any independent contractor to perform any of its obligations under the O&M Contract:

17.1.1. Engagement of OEMs for AMC of critical equipments as specified in the O&M Contract.

17.1.2. Engagement of OEMs for emergency repairs of any other items installed in the Terminal as approved by the Employer.

17.1.3. Engagement of Sub-contractor for carrying out housekeeping works as per the Scope of Work of tender, if so desired by the O&M Contractor.

17.1.4. Engagement of any other Contractor for specialised nature of work to be competed on emergency basis as approved by the Employer.

18. Staff Selection and Deployment:

18.1. The bidder need to ensure that the Personnel deployed meet the educational qualifications and experience and other criteria specified in Appendix-3 of the tender.

18.2. Within 7 days from the date of issue of Letter of Acceptance by the Employer, the successful bidder shall furnish the list of Personnel proposed to be deployed at MULT Terminal under O&M Contract, to Cochin Port Authority together with the relevant details and documents. After verification of the details and observing the formalities / requirements specified in the tender, the Employer, after ensuring the suitability of personnel as per the tender requirement, shall furnish a list of approved personnel to be deployed at MULT Terminal. During verifications, if it is found that the Personnel proposed by the successful bidder is not meeting the requirements specified in the tender same shall be notified to the successful bidder and alternate personnel meeting the tender requirement shall be deployed at the Terminal.

18.3. Police verification of contractor's Employees: The O&M Contractor shall furnish necessary Home-town Police Clearance Certificate in respect of character and antecedents of all Employees engaged, before commencing the deployment at the Terminal. The above requirement is also applicable in scenarios where the O&M Contractor is deploying sub-contracted Employees in the Terminal with the approval of the Employer. This will be a part of Contractual Agreement, as entire Cargo Jetty, Oil Jetty area has been declared as "Prohibited Area".

18.4. The Contractor shall ensure that all the required personnel / resources are available at the time of the handover so as to be able to appropriately takeover and commence the intended services in relation to each systems and equipments.

18.5. If the Contractor is required to deploy the staff on overtime basis, additional over time charges applicable if any, has to be borne by the Contractor. The Employer is obliged to pay the monthly O&M charges as accepted by the Employer, in accordance with the terms of the Contract.

18.6. The personnel of the Contractor must possess proper photo identity cards issued by the O&M Contractor. Entry and exist of the personnel to the Terminal shall be recorded in the Access Control System as detailed in the Tender Document.

18.7. Any new Personnel being deployed by the Contractor shall undergo orientation training as and when required.

18.8. Removal of Personnel at CoPA's Request: If CoPA complains of the conduct of the any of the Personnel deployed by the O&M Contractor and provides the reasons thereof, the O&M Contractor shall remove such Personnel on receipt of such compliant from CoPA and O&M Contractor shall nominate a suitable replacement with the prior approval of CoPA. All costs associated with such removal and replacement of such Personnel shall be borne by the O&M Contractor.

19. Damages: Any damage caused by the workmen engaged by the Contractor to any machinery or equipment or installation or property of Cochin Port Authority due to negligence, ignorance or malafide intention shall be made good at the cost and risk of the Contractor within a reasonable period of time acceptable to Cochin Port Authority, failing which the cost of the damages assessed by Cochin Port Authority shall be recovered from the bill of the Contractor or any money due to the Contractor.

20. All individuals engaged in the performance of the Contractor's obligations under this contract shall be the employees of the Contractor and their working hours, rates of compensation and all other matters relating to their employment shall be determined solely by the Contractor in accordance with the applicable laws & regulations. The Contractor shall be solely responsible for employment policies that specify the requirements for staff working under him and such policies are to be consistent and in line with the applicable labour laws and any government directives applicable to Cochin Port Authority.

21. Public Transport Facility: The MULT Terminal is located Puthuvypeen where public transport means are not available. The Contractor may note the above position and provide appropriate and safe transport arrangement for to and fro journey of his employees to the Terminal as well as that for Cochin Port officials in charge of the O&M contract at his cost and risk for the entire contract period.
22. The O&M Contractor shall provide for boarding, lodging, transport, leave and other facilities to all its Personnel in a manner to ensure timely, efficient, safe and reliable discharge of the Services to the CoPA.
23. O&M Contractor shall ensure that the Personnel deployed by him shall comply with, and the O&M Contractor shall be liable for and indemnify CoPA against any breach, infringement or non-compliance with any and all applicable Laws by such Personnel.
24. The O&M Contractor shall at all times take all reasonable precautions to prevent any unlawful, riotous or disorderly conduct by or amongst the Personnel, and to preserve peace and protection of persons and property on and near the area where the Services are performed. The O&M Contractor shall give prompt notice to CoPA of any such anticipated or actual unlawful, riotous or disorderly conduct.
25. Social Benefits: The O&M Contractor shall provide such social and employment benefits for its Personnel as are required by Laws.
26. Drug and Alcohol Policy: The O&M Contractor is responsible for ensuring that all the Personnel during the period of O&M Contract are not at any time in possession of, do not take, have not taken, and / or not under the influence of any intoxicating substance, or alcohol, or drug. The O&M Contractor shall ensure that all of the Personnel deployed by him at the Terminal are made aware of and comply with the above requirement.

C. Scope of Work (General)

1. CoPA propose to invite open tenders for engaging an O&M Contractor as per the following brief Scope of Work which consists of:

1.1. Part-A: To carry out operation, maintenance and repairs of Common Facilities and Services provided at the MULT Terminal and

1.2. Part-B: To carry out maintenance, repairs and up-keeping of POL handling facilities and other ancillary services to ensure healthiness of the all installed systems which are exclusively identified as Non-LPG Cargo Handling Facilities at MULT Terminal.

2. Part-A: Common Facilities & Services at the Terminal include but not limited to the following components: (Detailed inventory furnished at **Appendix-4**)

2.1. MULT Jetty with Breasting dolphins and Mooring dolphins equipped with capstan controlled quick release hooks and Service platform (34m x14m) capable of handling vessels of LOA 100 m to 230 m and 10000 DWT to 80000 DWT.

2.2. Control building with Fire pumps, Foam pumps, Jockey pumps, MCC panel and Power panel etc. in Ground floor, Foam tanks , Employer office rooms and server battery backup etc. in 1st floor and Fire control panel, Mimic panel, Fire alarm panel, Public address system , Trelleborg Marine systems, communication system etc. in 2nd floor .

2.3. Fire fighting facilities complying to OISD -156 STD (integrated for LPG and other liquids), the pipeline network from control building to DG station, covering Fuel station, MULT jetty, booster area hook up point excluding Manifold 1 hydrant lines.

2.4. Fuel station with 2x 20000 litres Underground tanks with Fuel pumps, controls etc.

2.5. 11 KV Sub-Station, HT/LT Switch Gears, Transformer, DG station with DG sets, HT/LT control panels etc.

2.6. Lighting arrangements complying to OISD STD on entire MULT road and inside the terminal excluding points beyond DG station up to Barge jetty.

2.7. Potable water line arrangement on MULT trestles.

2.8. Bituminous road with road side drain up to DG Station and approach trestle of the MULT Jetty.

2.9. Fire Safety

2.10. Safety
2.11. House Keeping of the Terminal.
2.12. Water Supply System

3. Part-B: Non- LPG Cargo handling facilities at the Terminal include but not limited to the following components: (Detailed inventory furnished at **Appendix-5**)

3.1. Barge Jetty (100m x 10m) capable of handling vessels of LOA 40 m to 120 m and 1500 DWT to 5000 DWT.
3.2. 12" Piggable product lines from MULT and Barge jetty extending to the Manifolds with slop / stripper pumps and slop tanks at jetties.
3.3. Compressor, Nitrogen and Slop return line from MULT and Barge jetty to the Manifolds.
3.4. Potable water line arrangement on Barge trestle.
3.5. Manifold 1&2 each equipped with 1x 20000 litres underground slop tank with slop pumps, compressor for pig launching purpose and nitrogen cylinders for line purging.
3.6. Fire fighting facilities complying to OISD -156 STD (integrated for LPG and other liquids) extending from DG station up to Barge jetty including both Manifolds.
3.7. Lighting arrangements complying to OISD STD from points beyond DG station up to Barge Jetty.
3.8. Bituminous road with road side drain from DG Station to the end of road towards Barge jetty and approach trestle of the Barge Jetty.

D. Scope of Work

4. This section provides details of Services to be provided by the O&M Contractor under the Agreement. In addition to the description set out hereunder, description of Services required to be provided by the O&M Contractor is also enumerated in other provisions of the Agreement. Without prejudice to such description hereunder and under various provisions of the Agreement, the O&M Contractor shall provide all such services which may be required for the timely and efficient performance of the Services.
5. The O&M Contractor selected by Cochin Port Authority through open e-tendering shall be responsible for carrying out the operation, maintenance and repairs of Common Facilities & Services at the Terminal as indicated at Clause No. 2 above (Part-A) and to carry out maintenance and repairs of Non- LPG Cargo handling facilities at the Terminal as indicated at Clause No. 3 above (Part-B) by providing appropriate man power possessing the required qualification, experience and training as per the detailed Scope of Work mentioned hereunder and subject to the Terms & Conditions mentioned above. The bidder is required to quote the O&M charges in a single of Bill of Quantities (BoQ). .
6. The equipments and facilities provided at the Terminal shall be operated and maintained in accordance with Original Equipment Manufacturers (OEM) Manuals, as per the relevant IS and standard guidelines of NFPA / OISD guidelines, in accordance with Good Industry Practice ensuring compliance with applicable Laws and Rules & Regulations promulgated by Cochin Port Authority or any other authority exercising jurisdiction in Cochin Port area, IOCL or any other applicable Governmental Authorities.
7. The contractor shall enter into Annual Maintenance Contract **at his own cost and risk** with the OEMs / OEM's Authorised service centres for the critical equipments viz. (i) DG Set including Diesel Engine, Alternator, PLC and control panels-2 sets,(ii) Fire Pump Engines-6 Nos, (iii) Fire Pumps and Jockey Pumps -8 Nos, (iv) Foam Pump -2Nos. during the tenure of Contract, to ensure uninterrupted operation of the above critical equipments. However, the spares required from the OEM for AMC part of work shall be procured after getting the approval from CoPA and the cost of OEM Spares shall be reimbursed as per actual on production of supporting documents.
8. The O&M Contractor shall enter into AMCs with the OEMs of respective Systems within 2 months from the date of Employer's LoA issued to the O&M Contractor. The Contractor has to consider the availability requirements mentioned above while framing the terms & conditions of AMC with the OEMs of critical equipments. If any cost incurred towards the maintenance/

servicing/ spares through the OEM of AMC required items shall be carried out by O&M Contractor during above non AMC period of 2 months and shall be reimbursed by the Employer on production of documentary evidences.

9. The AMC of Trelleborg Marine System (Complete Set such as Hook release interface with Server, Hook release control station, Weather station, Quick Release Mooring Hook, Display Board, Current & Wave Sensor and Tide Sensor)) will be taken directly by CoPA and its periodical inspection should be coordinated by the O&M Contractor. However, routine preventive maintenance is under the scope of O&M Contractor such as trial run, greasing, Electrical Terminal Checking, periodic cleaning, checking the foot switch etc., and keeping the system in working condition. Any defects noticed in the same shall be informed to the employer for taking action from the Employer side.

10. In non AMC period of Trelleborg Marine System, the cost incurred if any repair/ replacement of spares other than consumables shall be done by the O&M Contractor and the same shall be reimbursed by the Employer.

11. Other Equipments/ Instruments which are not listed at Clause No.7 above shall be maintained in all respect through experts at his own cost and risk including required spares as required for operation of the system

12. Supply of all Consumables required for carrying out the works as per the Scope of Work under the O&M Contract including AMC required equipment shall be purchased and stored by the Contractor at his cost and risk. Cost of such consumable items required for execution of O&M Contract shall be considered while quoting the rates for execution of O&M Contract. Consumables include but not limited to Engine Oil, Grease, Lubricating Oil, Hydraulic Oil, Coolant, Cotton Waste, Diesel required for operating Diesel Engines of Fire Pumps, Foam Pumps and DG Sets, Air Filters, Lube Filters, Fuel Filters of various Engines, Cleaning liquids for housekeeping etc. However, if the monthly consumption of Diesel exceeds 500 litres, CoPA will re-imburse the cost of excess quantity consumed on submission of supporting bills. The Contractor shall keep records on procurement of Consumables and its consumption and such records shall be made available for periodical inspection of Employer

13. The Contractor shall prepare the formats of Records to be maintained during the tenure of Contract pertaining to the operations, maintenance works and breakdown repairs and get it approved by CoPA.
14. All the staff deployed by the Contractor at the Terminal should be aware of the basic safety norms to be followed in a Port Terminal handling hydrocarbons and are bound to comply with the such safety norms of the Terminal.
15. Exclusions: The following items of works are excluded from the Scope of Work of O&M Contractor:

15.1. The facilities exclusively made for LPG cargo handling viz. 2 Nos. LPG Loading / Unloading Arms and related safety control Systems, Pipelines laid to the Booster Area which will be manned, operated and maintained by M/s. IOCL.

15.2. Supply of Security Personnel for MULT Terminal for which CoPA will make its own arrangement.

15.3. Procurement of Foam required for Fire Fighting is not included under the Scope of O&M Contract.

15.4. The scheduled periodical total painting of the equipments, pipe lines, installations, systems and facilities provided at the Terminal.

Detailed Scope of Work of Part-A (Operation, maintenance and repairs of common facilities & services of the MULT Terminal).

16. Operation and Maintenance of equipments in Fire pump house: The equipments in Fire Pump House include but not limited to the items mentioned in the inventory list enclosed as Appendix-4. The Contractor is required to carry out the manning, operation, maintenance and repairs of equipments, accessories and facilities as detailed below:

16.1. The Scope of work includes Operation, scheduled / preventive maintenance and breakdown repairs of 6 Nos. Fire pumps including engines, gear boxes and all accessories, Foam pumping system comprising of 1 No. Foam Pump coupled with engine, 1 No. Foam Pump coupled with electric motor including gear boxes, Foam filling Pump and accessories, 2 Nos. Electric driven Jockey pumps, in accordance with the OEM's manuals and as detailed in this tender document.

16.2. All the batteries of the engines are to be properly charged with the battery charger provided, electrolyte specific gravity / levels to be maintained, terminals properly tightened, battery surfaces cleaned and terminals to be covered with insulation mats to prevent accidental contact of battery terminals and related records shall be maintained.

16.3. Operation and maintenance of Motor Control Centre (MCC) panel, Power distribution panel, battery charging panel, backup power system, lighting and exhaust system and other controls and all items mentioned under Appendix-4 (Inventory list) shall be under the Scope of work of O&M Contract.

16.4. Repairs and maintenance of various types of electrical / control cables inside the Fire Pump House and cleaning / maintenance / repairs of cable trays shall be under the Scope of work of O&M Contract.

16.5. The Fire pump house staff shall assist the Fire crew to conduct weekly Fire pump / Foam pump trials.

16.6. The Fire pump house staff shall assist the staff deployed at Fuel station to fill up diesel in Fire pump / Foam pump engine day tanks.

16.7. The work of replenishing foam in Foam tanks with Foam filling pump and pumping of fresh water to the overhead tanks from ground tanks shall be carried out by the staff deployed at Fire pump house.

16.8. Operation and maintenance of 5 Ton HOT overhead crane inside Fire pump house shall be under the Scope of O&M Contract. Periodical testing of above overhead crane by Competent Authority shall be arranged by the Contractor.

16.9. For the maintenance and operation of equipments in Fire pump house, 2 Nos. Motor Mechanics, 1 No. Electrician with respective National Trade Certificate with minimum 2 years experience in the relevant trade shall be posted round the clock.

16.10. Proper records on operation and maintenance and repairs of equipments in Fire pump house as per the formats approved by CoPA, shall be maintained by the Contractor.

17. Operation and Maintenance of Equipments at Control Room:

17.1. The O&M Contractor shall be responsible for shore related works for berthing / unberthing operations of the vessel and to monitor the ship operations (LPG cargo handling operations will be responsibility of M/s. IOCL) during the stay of vessel at berth. In order to carry out the operational functions, O&M Contractor shall post one Shift in Charge of operations in the control room. The duties and responsibilities of Shift in Charge of operations are detailed under Appendix-3.

17.2. The Contractor has to carry out periodical maintenance of all the connected systems of the Trelleborg Marine systems including Power back up facilities installed maintained at 1st floor, display system and laser enclosure provided at jetty frontage. The Contractor needs to ensure 100% availability of Trelleborg system prior to berthing / unberthing and during the stay of vessel at the Terminal. Trelleborg Marine System being a critical equipment required for performing marine operations of the Terminal, in order to ensure 100 % availability of the system during berthing / unberthing / stay of vessel at the Terminal, the periodical inspection of the AMC of Trelleborg Marine System (Complete Set) taken directly by CoPA should be coordinated by the O&M Contractor.

17.3. Proper records on vessel operations as per the formats approved by CoPA, shall be maintained by the Contractor.

18. Operation and Maintenance of Equipments at Fuel station: Fuel station is equipped with 2 x 20000 litres underground storage tanks with 2 x fuel pumps. The work at Fuel station include but not limited to:

18.1. Receipt of diesel from tanker lorry which may be required once in 3 months or so and to store the diesel in UG Tanks.

18.2. Pumping of diesel from UG tanks to the day tanks located at DG station, Fire Pump Room as per the requirement received from the concerned section.

18.3. Maintenance of documents on receipt and distribution of diesel to individual day tanks at Fire Pump Room and DG Station.

18.4. All safety precautions shall be taken while receiving fuel from tanker lorries.

18.5. Receipt of diesel and pumping to the respective day tanks shall be preferably done during General shift hours.

18.6. As the receipt and distribution of diesel is not a regular affair, dedicated staff is not envisaged at Fuel station. The Contractor shall deploy the appropriate staff working in Fire Pump Room as per the requirements at Fuel Station.

18.7. Proper records on operation and maintenance and repairs of equipments in at Fuel Station and also the receipt and distribution of diesel as per the formats approved by CoPA, shall be maintained by the Contractor.

19. Operation and Maintenance of Electrical Sub-Station, DG Sets and Panels:

19.1. Sub-station compound comprises 1 No. 11KV/433 V Transformer, 2 Nos. Alternators coupled with diesel engines, power panels, distribution panels and other equipments listed in Appendix-4 (Inventory list) and its operation and maintenance comes under Contractor's scope.

19.2. Daily checks, Scheduled and Preventive maintenance of Transformer and DG sets etc. have to be carried out by the Contractor in line with OEM's recommendations and records to be maintained.

19.3. Weekly trials of DG set to be carried out to ensure auto starting on power failure.

19.4. Pipe lines are provided from Fuel Station to DG station for transferring diesel for the operation of DG Sets. The Contractor has to make arrangement for pumping of diesel to the DG station by deploying appropriate man power. Records for the receipt and consumption of diesel shall be maintained by the Contractor.

19.5. As the DG sets are operating on auto-mode, round the clock dedicated Staff is not envisaged at DG station. The Contractor shall deploy the appropriate electrical staff working in Fire Pump Room as per the requirements at DG Station.

19.6. The Contractor needs to ensure 100% availability of at least one DG set at all times with an overall availability of 90% for 2 DG sets during the Contract period. DG set being critical equipment required to perform the Terminal operations without any interruption, the Contractor shall enter into an AMC for the System with the OEM.

19.7. DGs are operated in master-slave mode depending upon the load, which is controlled by PLC.

20. Operation and Maintenance of Common User Facilities at MULT Jetty Frontage:

20.1. The Fire Fighting Facilities provided at the MULT Jetty Frontage (Appendix-4, Inventory list) are coming under Common User Facilities, are to be maintained by the O&M Contractor. The scope of work of Fire Fighting Facilities included under the O&M contract is furnished separately.

20.2. The contractor's scope of work at Jetty frontage includes connection / disconnection of fresh waterlines to the vessels as and when required.

21. Berthing / Un-berthing operations of Tankers:

21.1. Normally, CoPA will carry out mooring / unmooring operations of the Tankers calling at MULT Terminal. However, on emergency situations, the Contractor shall be responsible for mooring / unmooring operations of the Tankers calling at MULT Terminal as per the

instructions / requirement of IOCL and CoPA. The contractor shall be responsible for performing the above operations with the available manpower.

21.2. Adequate number of manpower for operation of mooring hook winches, carrying of messenger lines, engaging and disengaging of mooring hooks equipped at mooring and breasting dolphins arranged on either sides of the Service Platform, shall be engaged for berthing operations at MULT Jetty.

21.3. During the stay of vessel at berth, the Shift in Charge has to communicate the operational exigencies to the control room. The Shift in Charge is also required to monitor environmental parameters such as wind velocity, tide & wave, weather etc. prevailing at the Terminal premises and take appropriate action for the safe cargo handling operations and berthing / un berthing operations.

21.4. During un berthing of vessel, though disengagement of the mooring rope is done from the Trelleborg Hook release control station by the Control room personnel, staff may be deployed at berth to disengage the mooring hook for releasing the mooring rope in case of any failure of Hook release system.

22. The AMC of Trelleborg Marine System (Complete Set such as Hook release interface with Server, Hook release control station, Weather station, Quick Release Mooring Hook, Display Board, Current & Wave Sensor and Tide Sensor)) will be taken directly by CoPA and its periodical inspection should be coordinated by the O&M Contractor. However, routine preventive maintenance is under the scope of O&M Contractor such as trial run, greasing, Electrical Terminal Checking, periodic cleaning, checking the foot switch etc., and keeping the system in working condition. Any defects noticed in the same shall be informed to the employer for taking action from the Employer side.

23. Operation and Maintenance of Illumination system of the Terminal: The Contractor shall be responsible for keeping the illumination system of the Terminal in good working order and to maintain the required illumination level in different areas of the terminal during day and night operations as per requirement.

23.1. Following average Illumination levels provided at various locations of the Terminal shall be maintained by the O&M Contractor in view of the safety requirements:

Sl. No.	Location	Illumination Level in Lux
1	Service Platform MULT Jetty	300
2	Berthing Dolphin	100
3	MULT Bridge	100
4	Approach Trestle MULT Jetty	100
5	MULT Manifold	100
6	Fuel Station	100
7	Road	50
8	Barge Manifold	100
9	Approach Trestle Barge Jetty	100
10	Service Platform Barge Jetty	300
11	Conference / Office / Training Room	50
12	UPS / Electrical Room	30
13	Corridors	20
14	Control Room	50
15	LV and HV Panel room	30
16	Server Room	30
17	Dining area	30
18	Toilets	20
19	Stairways	20
20	Locker room	10

23.2. Operation of all the out-door illumination are regulated through timers. Hence manual intervention is normally not required. In case of malfunctioning of the system, appropriate electrical staff may be deployed from the pool of Fire Pump Room staff for switching on/ off and attending the complaints to the illumination system.

23.3. The repairs / replacement of lights, repairs and maintenance of total illumination system are under the Scope of O&M Contractor (required spares such as supply of light Fittings, Timers & Contactors, Cables shall be under the scope of CoPA).

24. Operation and Maintenance of Communication facility:

24.1. The Contractor shall be responsible for repairs and maintenance of communication facility such as VHF communication system and public address system with talk back in healthy condition during the tenure of the contract. This is very much essential for safe and effective operation and maintenance of the Terminal.

24.2. The Contractor shall be responsible for damage, theft, mishandling of the VHF communication system and talk back system provided at all operational points.

24.3. Cochin Port Authority shall handover the existing VHF sets (handsets, base stations, etc.) to the Contractor for use at the Terminal. At the end of the contract, the Contractor shall return the VHF sets and other communication facility received from Cochin Port Authority in good working condition.

25. Fire Safety: MULT being a Terminal handling LPG and other POL products, fire safety of the Terminal is of paramount importance. Man power, deployed to control Fire hazards should be competent enough to handle the Fire hazards of Tanker Terminals. The employees of the Contractor should be aware of the various statutory requirements / regulations of OISD and PESO. The Contractor's Scope of work includes but not limited to the following:

25.1. Contractor shall be responsible to attend Fire hazards and other adverse incidents at the Terminal in compliance with on-site emergency management plan of MULT Terminal.

25.2. The Shift in Charge shall be well trained and competent to handle Fire hazards and other emergencies and shall be made conversant with the fire fighting systems and public address systems installed at the Terminal.

25.3. Shift in Charge should provide support to the Maintenance and operational team to conduct weekly trials of Fire / Foam pumps and Monitors and all fire fighting systems as per OISD-156 STD requirements.

25.4. Operation of valves in Fire fighting / Foam lines and operation of monitors by remote and locally falls under the scope of work of Contractor.

25.5. Periodical maintenance of the fire fighting equipments has to be carried out and records to be maintained.

25.6. Any requirement of periodical re-filling & pressure testing of fire extinguishers shall be done by the Contractor at his own cost as per the procedure. In case of total replacements of fire extinguishers due to failure of pressure testing, the replacement of new fire extinguishers under the scope of Port.

25.7. Periodical Mock drills shall be conducted as per statutes / as advised by Employer to check the preparedness of facing a disaster in coordination with all sections.

25.8. The Contractor shall responsible for maintaining relevant records of the activities of Fire section as per the direction of Employer.

26. Safety:

26.1. All the work inside the terminal may be carried out in compliance with Dock workers (Safety, Health and Welfare) Act, 1986 and all other statutory / safety requirements as applicable.

26.2. The Contractor shall post a Safety Officer who has to ensure that all the operational and maintenance activities are carried out in accordance with laid down SoP and by observing the safety / statutory requirements of the Terminal.

26.3. Safety Officer shall report to the Shift in Charge of operations of the Terminal.

26.4. The Contractor shall be responsible to ensure the safety of the Terminal and all of the Terminal Personnel, other personnel employed by the Contractor for the services and other individuals and invitees who are at any time on the Terminal.

26.5. The contractor shall provide on-going and refresher training on safety for all his employees as per the directions issued by the Employer from time to time.

26.6. The Contractor shall conduct annual calibration of all measuring devices which are fitted in the terminal.

26.7. The Contractor shall conduct periodical visual testing of lifting equipments through Competent Authority / gears used for the purpose of maintenance activities like fabrication / repairs / overhauling / disassembly / assembly, etc. and also storing of spares and stores under the scope of O&M Contractor.

26.8. In case the Contractor has intention to install / engage any machines / equipment / accessories in connection with the execution of O&M Contract, it shall meet the standards of equipments intended to use inside the Terminals handling Hydrocarbons. The Contractor shall obtain approval of Employer / Statutory authorities for such usage, as applicable before installation / usage of such equipments.

26.9. Adequate precautions shall be taken to prevent accidents from electrical equipment. When workers are employed on electrical installations, which are already energized, insulating mats, working apparels such as gloves, sleeves and boots as may be necessary shall be provided to the workers by the Contractor.

26.10. All the maintenance activities shall be executed after taking shutdown and issuance of work permit from Sub-stations or E-house of machines. The Contractor must obtain written clearance whenever required, in a format (maintained in shutdown register) acceptable to Cochin Port Authority, clearly indicating the nature of maintenance intended to be undertaken, the equipment name, expected time of commencement and completion. The Contractor shall also mention the time that he would require to bring the machine to operational condition in the event of any emergency need.

26.11. Contractor shall take all reasonable precautions to avoid pollution or contamination of the air, land or water arising out of the performance of the work.

26.12. Should there be a discharge or escape of appreciable quantity of pollutants or contaminants during performance of its obligations under this Contract which occurs as a result of activities of Contractor or its Sub-contractor, the Contractor shall immediately take all action necessary to contain, control, recover or disperse the substance and to eliminate the safety and environmental risks and correct the damage resulting there from.

26.13. The Contractor shall provide first-aid equipment for on-site emergency medical treatment and deploy a Safety Officer to enforce and refreshment of safety measures among all the Contractor personnel. The Contractor shall provide on-going and refresher training for all his personnel which will help in increase productivity.

26.14. The Contractor shall maintain all records pertaining to the safety matters of the Terminal.

27. Security of the Terminal:

27.1. The Employer will deploy Security Personnel through a separate Contractor. The O&M Contract shall co-operate with the Contractor engaged by Cochin Port Authority for security.

27.2. The Contractor shall maintain various records and registers pertaining to the security of the Terminal.

28. Civil Works: During the contract period, it is anticipated that only minor civil maintenance works needs to be carried out by the Contractor under O&M Contract. The work may include broken concrete pavement in civil structures and buildings, dislodged tiles, false sealing etc. in buildings, leaks to fresh water lines, sanitary blockages, etc. The O&M Contractor is required to carry out such civil maintenance / repair works including procurement of all materials required, at his cost and risk.

29. Housekeeping / Cleanliness:

29.1. It is the responsibility of the Contractor to maintain the cleanliness in the entire terminal area including offices by deploying adequate number of staff. The requirement of housekeeping include but not limited to the areas viz. Fire Pump Room, Foam Tank Room and Offices, Rest Rooms, Control room (The approximate floor area of offices 500 Sq. meters), Fuel Station, DG Station, Toilets and wash area inside Office buildings and outside (Total 3 Nos.), Pedestal Walkways, LPG Jetty, Barge Jetty premises, Manifold area (both Barge Jetty and LPG Jetty), bi-roads inside the compound.

29.2. The scope of housekeeping work of the Contractor shall cover, but not limited to, the following:

29.2.1. Cleaning of floors (approximate floor area 500 Sq. meters) and removal of cobwebs in the buildings mentioned above.

29.2.2. Sanitation of toilets and wash area (total 3 Nos.)

29.2.3. Clearing of waste materials etc. from approach trestle towards jetty frontage, berth floors and maintain it clean and tidy.

29.2.4. Manifold areas of LPG Jetty and Barge Loading Jetty should be made clean at all times by removing wastes, debris, oil / grease contaminations etc. by applying appropriate cleaning agent.

29.2.5. Cleaning of road side drain to maintain drainage / sewage system. Special attention in this regard shall be given prior to monsoon to avoid water logging.

29.2.6. Periodic clearing of bushes, grasses etc. to prevent growing of vegetation inside the terminal.

29.2.7. De-watering and cleaning of cable pits.

29.2.8. Cleaning of internal roads within the Terminal Compound.

29.2.9. Material shall be stored in locations, which will not block access ways and permit easy cleaning of the area.

29.2.10. Spillage of oil, grease etc. to the floor, from equipments should be avoided to keep the floor clean and tidy.

29.2.11. All hoses, cables, and similar items shall be located, arranged, and grouped so that they will not block any access way and will permit easy cleaning and maintenance.

29.2.12. All trash, debris, scrap and waste materials shall be collected, segregated according to class, stored, and deposited in waste collection areas as designated by the Contractor acceptable to the Cochin Port Authority.

29.2.13. Oil spills / oily waste should not be allowed to throw into sea water.

29.2.14. Waste materials / garbage collected shall be removed from the Terminal and disposed by the Contractor at his cost and risk and adhering the statutory norms.

29.3. <u>All the consumables and various housekeeping equipments required for housekeeping works shall be arranged by the Contractor at his cost. The bidders may consider this aspect while furnishing their financial bid.</u>

29.4. The Contractor shall have the option to carry out the house keeping works through sub-contracts also subject to the approval of the Employer.

29.5. The Employees deployed for housekeeping are required to wear PPE as per the safety requirements of the Terminal and shall follow all safety instructions of the Terminal issued by the Employer from time to time.

29.6. The Contractor shall maintain all the records pertaining to the house keeping of the Terminal.

30. <u>Provision for Multi Utility vehicle:</u> The contractor has to deploy one number suitable type Multi Utility Vehicle during the tenure of contract to facilitate timely transportation of materials and workmen. All costs associated with deployment of above vehicle including cost of fuel, maintenance, driver costs etc. shall be borne by the Contractor. The Contractor may note that the above vehicle shall not be permitted to enter the restricted areas of the Terminal.

31. <u>Water supply:</u> Water supply from Kerala Water Authority is yet to be established at the Terminal. In order to meet the day-to-day requirement of fresh water at the Terminal, the Contractor has to make arrangement at his cost and risk to procure fresh water through Tanker

Lorries. The Contractor shall also make arrangement to procure and provide potable water in dispensers to be provided at various locations of the Terminal. The above arrangement shall be continued until water supply arrangement of KWA is established to the Terminal. Two Nos. 5000 litres capacity each tanks are provided inside the Terminal. Water supplied through Tanker lorries shall be metered while filling to the above Tanks and quantity received shall be accounted through appropriate registers.

32. Provision of Hydra Cranes, Forklifts, Sky lift etc.:

32.1. If deployment of any specialised equipments like Hydra Crane, Forklift, Sky-lift etc. from outside agencies is required for performing any work of special nature, essentiality of such requirements shall be communicated and such deployment shall be done with the consent of the Employer.

32.2. Sources of such equipments shall be identified by the Contractor in advance and responsibility of timely engagement of such equipments shall be vest with the contractor. Engagement of such equipments shall be done at the full risk, cost and responsibility of the Contractor.

32.3. Operation of the above vehicles shall in compliance of the Safety norms of the Terminal handling hydrocarbons.

33. Electricity: Electricity required for functioning of the Terminal as per the Scope of Work of the Contract will be provided by Cochin Port Authority on CoPA account.

34. The bidders shall consider all the items above while quoting the rates for line item "Part-A: Manning, Operation, Maintenance and Repairs of Common Facilities & Services of the Terminal".

Detailed Scope of Work of Part-B (Maintenance and up-keeping of POL handling facilities and other ancillary services termed as "Non-LPG cargo handling facilities at MULT Terminal".

35. Operation and Maintenance of Fire Fighting Facilities at Barge Jetty: Fire Fighting Facilities provided under the heading "Inventory of Non-LPG Handling Facilities", Appendix-5 are to be maintained by the O&M Contractor. Scope of work of Fire Fighting Facilities described in Part-A above and Maintenance Program is also applicable for Fire Fighting Facilities provided under Non-LPG Cargo Handling Facilities of MULT Terminal.

36. Maintenance of Non-LPG Handling Facilities at MULT Jetty: Non-LPG handling facilities listed under the heading "Inventory of Non-LPG Handling Facilities", Appendix-5. However, the O&M Contractor is required maintain and up-keep the installed facilities at MULT Jetty for handling Non-LPG cargo, at the minimum level and to carry out periodical trials of equipments / machineries to keep these equipments in good working order. The above periodical works are to be carried out during general shift. Brief Scope of work of the O&M Contractor under Part –B at MULT Jetty area include but not limited to the following:

36.1. Two Nos. each motor driven Slope Pumps and Stripper Pumps are to be tried out once in a week and the defects if any found during the trials are to be rectified by the O&M Contractor.

36.2. There are total six Nos. Lines laid from the MULT Jetty leading to the backup area of the Jetty as detailed under the heading "Product line" and "Utility line". The Scope of O&M contract includes the routine maintenance of lines, line supports, trestles, valves, gauges, fittings maintenance painting , greasing etc.

36.3. The items such as Pig Launcher, PRV, Pressure Transmitters, Temperature Transmitters, slope oil lines, slop tanks etc. mentioned in Appendix-5 meant for Non-LPG cargo movement at MUTL Jetty frontage are to be maintained by O&M Contractor. The equipments need to be maintained as per OEM's maintenance schedules. Bear minimum maintenance is required to keep the Non-LPG cargo handling system in good working order and the same is required to be carried out only periodically.

37. Maintenance of Non-LPG Handling Facilities at Barge Jetty: The O&M Contractor is required to maintain the installations provided at Barge Jetty at the minimum level to keep the machineries, equipments and other facilities in good working order. Such periodic maintenance works are to be carried out during general shift. The brief Scope of work of the O&M

Contractor for maintaining Non-LPG handling facilities listed under the Heading Barge Jetty" of Appendix-5 (Inventory list) is as follows:

37.1. Two Nos. each, motor driven Slope Pumps and Stripper Pumps are to be tried out once in a week and the defects if any found during the trials are to be rectified by the O&M Contractor.

37.2. Total six Nos. lines are laid from the Barge Jetty leading to Manifold 2 located at the back up area of Barge Jetty and as detailed under the Heading "Product line-barge jetty and the Heading "Utility line Barge Jetty " of Appendix-5. The scope of O&M contract includes routine maintenance of lines, line supports, trestles, valves, gauges, fittings, maintenance painting , greasing etc.

37.3. The facilities such as Pig Launcher, PRV, Pressure Transmitters, Temperature Transmitters, slope oil lines, slop tanks etc. at Barge Jetty frontage meant for Non-LPG cargo movement are to be maintained by O&M Contractor. The machineries and equipments needs to be maintained as per OEM's maintenance schedules.

38. Maintenance requirement of Equipments and Facilities at Manifold No.1: Manifold No.1 located at the back up area of the MULT Jetty consists of 1x 20000 litres underground slop tank for slop receipt from MULT jetty, 2 x slop out pumps, 2 x pig receivers and 1 x compressor for pig movement meant for Non-LPG Cargo movements. The details of equipments, machineries and accessories installed at Manifold No.1 which are required to be maintained under the O&M Contract are indicated under the Heading "Manifold No.1" of Appendix-5. The brief Scope of work of the O&M Contract include but not limited to:

38.1. Two Nos. Motor driven Slope Pumps are to be tried out once in a week and the defects if any found during the trials are to be rectified by the O&M Contractor.

38.2. The items mentioned under the heading "Manifold No. 1" of Appendix-5(Inventory list) such as Electric Reciprocating Air compressor and Accessories, Fire Fighting Facilities, 20 KL capacity Slop Tank, Pig Receivers etc. are to be maintained by O&M Contractor. The machinery / equipments needs to be maintained as per OEM's maintenance schedules.

39. Maintenance Requirement of Equipments and Facilities at Manifold No.2: Manifold No.2 located at the back up area of the Barge Jetty consists of 1x 20000 L underground slop tank for slop receipt from Barge jetty, 2 x slop out pumps, 2 x pig receivers and 1 x compressor for pig movement meant for Non-LPG Cargo movements. The details of equipments, machineries and accessories installed at Manifold No.2 which are required to be maintained under the O&M Contract are indicated under the Heading "Manifold No. 2" of Appendix-5 (Inventory list). The brief Scope of work of the O&M Contract include but not limited to:

39.1. Two Nos. Motor driven Slope Pumps are to be tried out once in a week and the defects if any found during the trials are to be rectified by the O&M Contractor.

39.2. The items under the heading "MANIFOLD 2" of Appendix-5 such as Electric Reciprocating Air compressor and Accessories, Fire Fighting Facilities, 20 KL capacity Slop Tank, Pig Receivers etc. are to be maintained by O&M Contractor. The machinery / equipments need to be maintained as per OEM's maintenance schedules.

40. Operation and Maintenance of Illumination system at Barge Jetty:

40.1. The Contractor shall be responsible for keeping the Illumination System of the Barge jetty in good working order and to maintain the same properly to ensure the illumination level specified earlier in this document. The required spares such as supply of Light Fittings, Timers & Cables will be under the scope of CoPA for maintaining the Light system at operational area

40.2. Operation of all the out-door illumination are regulated through timers. Hence manual intervention is normally not required. In case of malfunctioning of the system, appropriate electrical staff may be deployed from the Fire Pump Room staff for switching on / off and attending the complaints to the illumination system.

40.3. The bidders may note that the facilities indicated under " Non-LPG handling Facilities" is not expected to be operational during the current O&M contract period and hence bear minimum maintenance is required to keep the Non-LPG Cargo handling Systems in good working order and the same is required to be carried out only periodically. The Contractor

shall carry out the maintenance of Non-LPG handling facilities with the maintenance staff posted in General Shift as per the requirement.

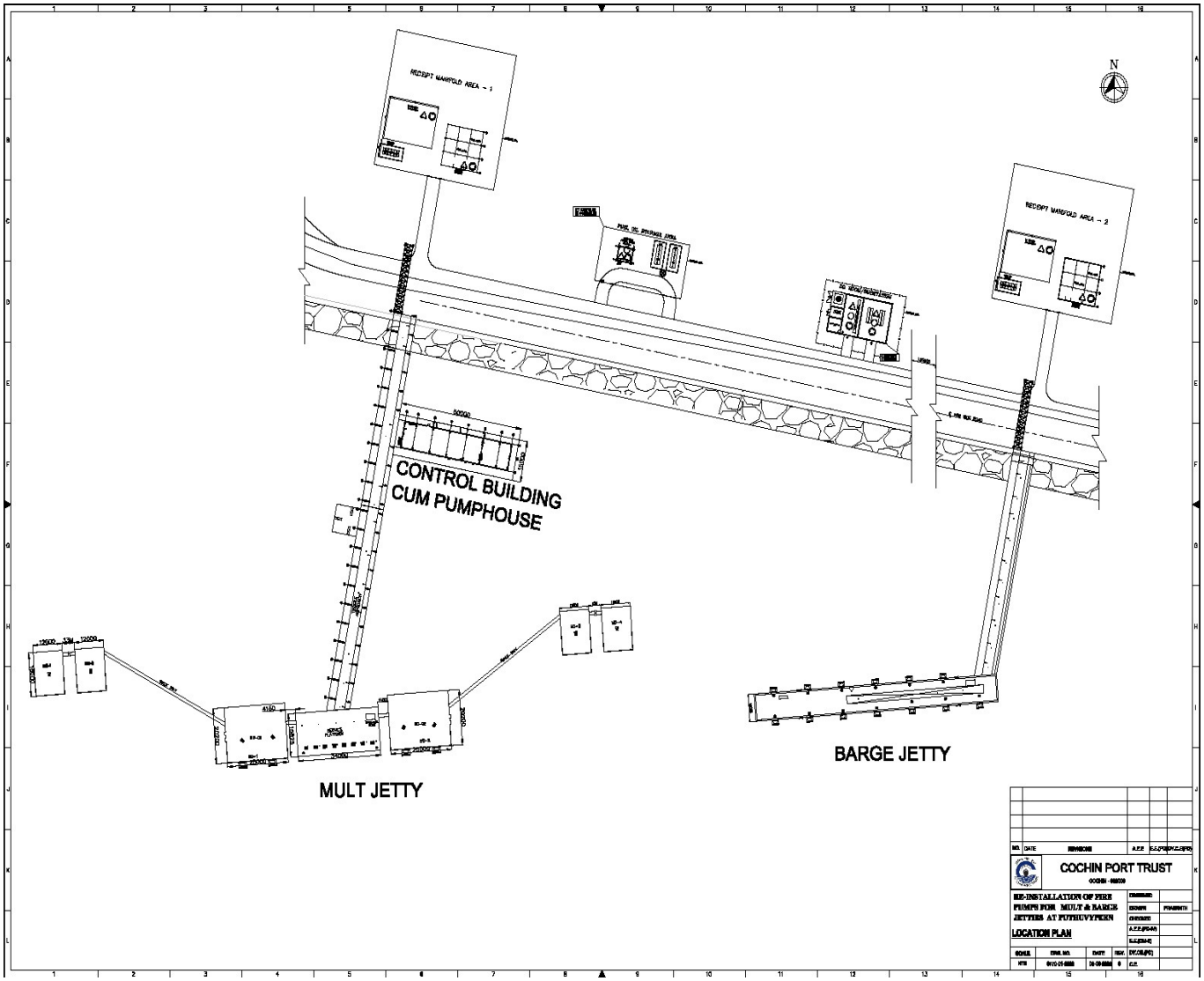
41. The Contractor shall maintain appropriate records pertaining to all the maintenance works specified above.
42. The bidders shall consider all the items above while quoting the rates for line-item "Part-B: Manning, Maintenance and up-keeping of POL Handling Facilities and other Ancillary Services termed as "Non-LPG Cargo Handling Facilities at MULT Terminal". Mode of execution of maintenance works are detailed at Appendix-2, Maintenance Program of the Terminal.

E. Man Power Requirement under O&M Contract:

43. The O&M Contractor shall perform various obligations under the Contract by providing the minimum number of Personnel as detailed at Appendix-3. All the personnel deployed shall be adequately qualified and experienced to handle the relevant functions and shall meet the requirements indicated in the tender document.
44. Manpower requirement indicated in the Tender Document is the minimum manpower required to carry out the various works as per the Scope of work of O&M Contract as assessed by CoPA. The Contractor is bound to provide the man-power as per the above minimum requirement of staff in various categories both in shifts and in General Shift.
45. It is the responsibility of the bidders to assess the adequacy of above staff strength to perform various contractual obligations as per the Scope of Work in an efficient, timely, reliable manner (which shall at all times be consistent with Good Industry Practice and in accordance with the applicable statutory / safety requirements). During the tenure of O&M contract, even if the staff strength is increased by the Contractor, Employer is not bound to make any additional payment over and above the quoted rates. However, for deployment of such additional man power, Employer's prior consent is required. Job descriptions, educational qualifications and experience requirements of various categories of Personnel are also indicated in Appendix-3.

Appendix-1

MULT LAYOUT



Appendix-2

MAINTENANCE PROGRAM OF THE TERMINAL

1. General:

1.1. The maintenance of the whole systems of the Terminal shall be carried out as per OEMs Manuals, the relevant IS and standard guidelines of NFPA / OISD guidelines as applicable.

1.2. Maintenance of Terminal primarily aims at keeping the Terminal and equipment under the scope of the Contractor in efficient and reliable operating conditions, minimizing the downtime during operation so as to ensure their maximum availability and productivity.

1.3. The contractor's scope covers deployment of different maintenance teams comprising of Engineers, supervisors, technicians, skilled / semi-skilled workmen for efficient and effective preventive, predictive and corrective maintenance during the term of the contract.

1.4. The maintenance of machine / system / equipment shall be done by the Contractor in accordance with recommendation of Original Equipment Manufacturer and taking into account the current status of system / machinery / equipment by following Sound Engineering practice and Industry Standards. The Contractor shall follow the maintenance practice / activities as given below.

1.5. It is responsibility of the O&M Contractor to make available all the required tools, equipments and other facilities required for carrying out the maintenance and repair works of various equipments and Systems available at the Terminal. Maintenance / repair works shall not be delayed on account of lack of appropriate tools and tackles.

2. Preventive Maintenance: The Contractor shall carry out the Preventive Maintenance of the equipment / systems / units attached as Appendix-4 and Appendix-5 as per OEMs maintenance Schedule and shall maintain the records as per the formats approved by Cochin Port Authority.

3. Corrective Maintenance / Breakdown Maintenance: During operation if any abnormalities / defects / faults are observed and in case of failures of components occurs resulting in breakdown of the equipment, the Contractor shall attend problems then and there so as to restore operation within the bare minimum time by repairing otherwise by replacement.

4. Shutdown Maintenance: For undertaking the major maintenance activities, planning shall have to be done by the Contractor in advance and in consultation with the Engineer of Cochin Port Authority so as to make the best use of the idle period. The Contractor shall properly plan for execution of maintenance activities during non-operational time of systems / equipments.

5. Condition Monitoring:

5.1. Inspection of all equipment shall be carried out by the Contractor before and after operation of the Terminal in accordance with maintenance manual of individual equipment / manufacturer's recommendation. The Contractor shall carry out condition monitoring while the equipment is in service or when the equipment is under shut down maintenance for some other reason and assessment along with visual inspection.

5.2. The Contractor shall prepare a check list in order to ensure correct and proper inspection. Inspection and condition monitoring shall also include use of inspection equipment and testing devices to determine the extent of defect at the cost of the Contractor. Action shall be taken on the observations during inspection and condition monitoring.

6. Periodic Inspection by O&M Contractor

6.1. The Contractor shall arrange periodic inspection of the all equipments through OEMs/ Authorised Dealers/ Experts in the field in case of non OEM items.

6.2. Periodic inspection of equipments at Clause No. 6.1. above by the concerned OEMs shall be arranged by the Contractor as and when advised by the Employer to assess the healthiness of the systems and make suitable recommendations to maintain the equipments / systems in good order. The inspection report of OEMs, to be submitted to the Employer, shall contain present condition, recommendations covering the works to be carried out, spares to be replaced and stock / inventory to be maintained for smooth operation & maintenance. Payments towards such

inspection shall be paid by the Contractor to the OEMs. However, the spares required from the OEM for AMC part of work shall be procured after getting the approval from CoPA and the cost of OEM Spares shall be reimbursed as per actual on production of supporting documents.

6.3. Annual Maintenance Contracts: The contractor shall enter into Annual Maintenance Contract **at his own cost and risk** with the OEMs / OEM's Authorised service centres for the equipments viz. (i) (i) DG Set including Diesel Engine, Alternator, PLC and control panels-2 sets,(ii) Fire Pump Engines-6 Nos, (iii) Fire Pumps and Jockey Pumps -8 Nos, (iv) Foam Pump -2 Nos. during the tenure of Contract, to ensure uninterrupted operation of above critical equipments. AMCs shall be entered by the Contractor with the above OEMs within a period of 4 months from the date of issue of award of O&M Contract by Cochin Port Authority. However, the spares required from the OEM for AMC part of work shall be procured after getting the approval from CoPA and the cost of OEM Spares shall be reimbursed as per actual on production of supporting documents.

6.4. The O&M Contractor shall enter into AMCs with the OEMs of respective Systems within 2 months from the date of Employer's LoA issued to the O&M Contractor. The Contractor has to consider the availability requirements mentioned above while framing the terms & conditions of AMC with the OEMs of critical equipments. If any cost incurred towards the maintenance/ servicing/ spares through the OEM of AMC required items shall be carried out by O&M Contractor during above non AMC period of 2 months and shall be reimbursed by the Employer on production of documentary evidences.

6.5. The AMC of Trelleborg Marine System (Complete Set such as Hook release interface with Server, Hook release control station, Weather station, Quick Release Mooring Hook, Display Board, Current & Wave Sensor and Tide Sensor)) will be taken directly by CoPA and its periodical inspection should be coordinated by the O&M Contractor. However, routine preventive maintenance is under the scope of O&M Contractor such as trial run, greasing, Electrical Terminal Checking, periodic cleaning, checking the foot switch etc., and keeping the system in working condition. Any defects noticed in the same shall be informed to the employer for taking action from the Employer side.

6.6. In non AMC period of Trelleborg Marine System, the cost incurred if any repair/ replacement of spares other than consumables shall be done by the O&M Contractor and the same shall be reimbursed by the Employer.

6.7. Other Equipments/ Instruments which are not listed at Clause No.6.3 above shall be maintained in all respect through experts at his own cost and risk including required spares as required for operation of the system.

7. Safety Interlocks: During the operation of Terminal, all field devices, safety devices and monitoring devices shall be maintained in good working order and set as per the designed parameters. These settings along with Terminal operational limits shall not be tampered/ or modified under any circumstances. All machines / systems shall be operated with the adequate number of man power. Similarly, operation of machine / equipment / system / subsystem shall not be carried out in abnormal condition (s) and by compromising with safety of machines. Normally bypassing of field devices and monitoring devices are not permissible and if such by-passing is done in extreme emergency situations, the relevant details shall be recorded. The Terminal shall be operated consistently with the operational limits, safety and Good Industry Practice.

8. Operational Pre-checks: Before and during operation of Terminal, observance of basic rules of operation, systematic and careful inspection of the individual parts of the system and equipment, pre-checking the functions of all sub-systems and components at appropriate time are essential and to be ensured. The checks have to be made strictly in accordance with the check lists and documented for the concerned machine / equipment.

9. Competency of Personnel operating / maintaining the Facilities: In order to have safe operation / maintenance of the facilities, the concerned personnel should be conversant with the functional requirement and control philosophy of system(s) and equipment and should be capable of recording the events / incidents during operation / maintenance, noting the parameters & maintain the log books at the respective stations as per the scheduled requirement and instructions issued by Cochin Port Authority from time-to-time. The Engineers / supervisors attached to operation / maintenance must be conversant with the technology of various systems, equipment and machines. They have to co-ordinate with the operating personnel for smooth operation. They have to be vigilant and should promptly respond to any operational / maintenance requirements.
10. Lubrication / Greasing: The Contractor shall prepare and implement the lubrication / greasing schedule of all machines and system/units. Proper lubrication / greasing of all the moving parts of the equipment / units / system is the responsibility of the contractor and any breakdown due to above shall be treated as a default on the part of contractor. Records on greasing/lubrication done shall be maintained by the Contractor.
11. Maintenance of Earthing System: The Contractor has to check and maintain the Earthing System of various equipments of the Terminal / Sub-station on monthly / quarterly / half yearly basis as applicable as per OEMs requirements.
12. Cable Maintenance: The Contractor shall maintain the cables spread around the Terminal and shall ensure proper dressing of the cables through cable trays and cable trenches.
13. Maintenance of Batteries: All the batteries included in the Inventory List are to be properly maintained by the O&M Contractor. If any of the batteries becomes unserviceable during the tenure of the Contract, the same has to be renewed with batteries having the same rating, at the cost of the O&M Contractor.
14. Procurement of spares, consumables and materials for attending various works as per the Scope of Work of O&M Contract.

14.1. Procedure for carrying out repairs / overhauling of entire items, equipments and facilities covered under the O&M contract: The contractor shall arrange for timely repairs / overhauling of entire items, equipments and facilities covered under the O&M contract either by him or by sub-contracting for maintaining the Fire fighting system as per the availability criteria mentioned above. The entire cost for above repairs shall be borne by the contractor.

14.2. Procurement of materials spares etc. to execute the works: Procurement of all materials spares and services required for carrying out the works as per the Scope of Work of O&M Contract shall be arranged by the Contractor at the quoted rate of O&M Contract. The O&M Contractor is also required to carry out civil works and housekeeping works including procurement of all materials required, at his cost and risk. However, the spares required from the OEM for AMC part of work shall be procured after getting the approval from CoPA and the cost of OEM Spares shall be reimbursed as per actual on production of supporting documents.

14.3. Procedure for procurement of consumables for routine use / maintenance: Supply of all Consumables required for carrying out the works as per the Scope of Work under the O&M Contract including AMC required equipment shall be purchased and stored by the Contractor at his cost and risk. Cost of such consumable items required for execution of O&M Contract shall be considered while quoting the rates for execution of O&M Contract. Consumables include but not limited to Engine Oil, Grease, Lubricating Oil, Hydraulic Oil, Coolant, Cotton Waste, Diesel required for operating Diesel Engines of Fire Pumps, Foam Pumps and DG Sets, Air Filters, Lube Filters, Fuel Filters of various Engines, Cleaning liquids for housekeeping etc. However, if the monthly consumption of Diesel exceeds 500 litres, CoPA will re-imburse the cost of excess quantity consumed on submission of supporting bills. The Contractor shall keep records on procurement of Consumables and its consumption and such records shall be made available for periodical inspection of Employer. Foam Compound (AFFF) required for the Fire Fighting operations through Tower and Base Monitors are currently available. Any replenishment of the same during the tenure of O&M Contract will be done by Cochin Port

Authority on Port Account. Fire extinguishers are currently filled with the consumables viz. Water, Foam and DCP as per requirement. Any subsequent filling of such consumables in the Fire Extinguishers shall be under the responsibility of the Contractor at his cost. All repairs, maintenance, whenever required for the Fire Extinguishers are to be carried out by the O&M Contractor at his cost. Any requirement of periodical re-filling & pressure testing of fire extinguishers shall be done by the Contractor at his own cost as per the procedure. In case of total replacements of fire extinguishers due to failure of pressure testing, the replacement of new fire extinguishers under the scope of Port. The Contractor shall entrust Shift in Charge to monitor receipt of spares, consumables etc. and to maintain proper documentation on inventory and issue of stores as per the requirement of the Employer.

15. Defect Rectification: (General shift work):

15.1. Daily visual inspection has to be carried out to detect any defects / corrosion in the Steel structures, product lines, fire water lines, foam lines, mechanical and electrical fittings, electrical panels, electrical and communication cables etc. Defects noticed may be rectified within the shortest possible time.

15.2. All the steel structures and pipe lines inside the terminal need proper maintenance painting/Patch work to guard against corrosion. Staff may be deployed to carry out maintenance painting of the corroded areas as per the painting scheme provided as follows. The surface preparation shall be done with mechanical cleaning / wire brushing. Painting shall be carried out with primer coat of Epoxy mastic high build primer - 1 coat DFT- 135-150 µm and finish coat of Polysiloxane - 1 coat DFT- 100-125 µm with a total thickness of 2 coats- DFT- 235- 275 µm. Contractor shall have to make thorough surface preparation before application of paint. Paints required for work shall be procured by the Contractor.

15.3. Greasing / lubrication / servicing of all gate valves, hydrant valves, deluge valves, Mooring hooks, Monitors and other equipments are also to be carried out in General shift.

15.4. The contractor shall maintain a pool of General shift workers comprising of Motor Mechanics and Electrician to attend General shift maintenance activities. Crew posted in shift shall also be utilised for maintenance activities of the Terminal. The Shift in Charge shall be the responsible person for coordinating the maintenance activities of the Terminal.

16. Defects Reporting: During operation / maintenance, if any abnormality, defect / fault are noticed on any system, the same shall be promptly communicated to the supervisors and remedial steps must be taken under intimation to the Engineer in Charge of Cochin Port Authority. The contractor shall set a suitable mechanism for rectification of problems so that delay in operation can be avoided. Stoppages during operation, any type of abnormalities including adverse operating condition or characteristics, bypass of safety devices shall be recorded and same shall be intimated to Shift in Charge with follow–up action.

Appendix-3

JOB DESCRIPTIONS, EDUCATIONAL QUALIFICATIONS AND EXPERIENCE REQUIREMENTS OF PERSONNEL

1. Shift in Charge: A Competent Person shall be posted as Shift in Charge of Operations at Control Room on round the clock basis who shall be responsible for controlling the Terminal operations during the shift. The responsibilities include but not limited to controlling / monitoring the berthing / un berthing of vessels, remote operation of mooring system, co-ordinating / leading the various operating wings viz. Fire Fighting, Mooring Team, Security etc. through VHF or other communication means, monitoring the Terminal functions with the aid of Trelleborg Marine System during cargo handling etc. Shift in Charge should ensure operational readiness of the Mooring system prior to vessel berthing / unberthing operations. Shift in Charge should have basic knowledge of cargo handling operations from the Ships. The Shift in-charge shall be responsible for communications with Terminal Operators and Port Authority on day to day operations. The qualification of Shift in Charge is that he should possess Degree / Diploma in Mechanical / Electrical and Electronics Engineering with minimum 3 years experience in Foreshore terminals / Refineries and with additional qualification of Diploma in Fire & Safety. The Shift in Charge shall plan and co-ordinate all the activities including pre-operational checks etc. While performing major repairs / maintenance works, there shall be proper communication with all the stake holders associated with Ship operations and should be done with the consent of Cochin Port Authority and M/s. IOCL as applicable.
2. Safety Officer: The Safety Officer shall possess Degree / Diploma in Mechanical / Electrical and Electronics Engineering with Diploma in Industrial Safety with 3 years experience in Industry and will be in charge of all safety related matters as per the Scope of Work.
3. Motor Mechanic: The Motor Mechanic shall possess National Trade Certificate with two years experience in relevant field and will carry out repairs and maintenance of Fire pumps, Engines, Jockey Pumps, Valves, Monitors, Jumbo Curtains, Hydrants, pipelines and all other installations of the terminal as per the Scope of Work. He shall be capable of performing firefighting operations on emergency situations.
4. Electrician: The Electrician shall possess National Trade Certificate with two years experience in relevant field and will carry out all electrical repairs and maintenance works in the Terminal as per the Scope of Work. He shall be capable of performing firefighting operations on emergency situations.
5. Fireman: The Fireman shall posses Matriculation, successful completion of certificate course on Basic Firefighting training from a Govt. Organisation/ Institution approved by Government. Two year's experience in relevant field. He shall be capable of acting as multy-tasking helper for all maintenance repairs and cleaning activities.
6. Housekeeping Staff: They should possess at least 7^{th} Standard pass and will carry out all the housekeeping activities as per the Scope of work.
7. Educational qualification, experience requirements of various categories of employees are furnished as below:

Sl. No.	Designation	Reqmt. per shift	Reqmt. per day	Qualification / Experience
1	Shift in Charge	1 per shift	4	Upper Age limit: 45 years Degree / Diploma in Mechanical or Electrical and Electronics Engineering with minimum 3 years experience in Foreshore terminals / Refineries and with additional qualification of Diploma in Fire & Safety.
2	Safety Officer	1 in General	1	Upper Age limit: 45 years

		shift		Degree / Diploma in Mechanical / Electrical and Electronics Engineering with Diploma in Industrial Safety with 3 years experience in Industry.
3	Motor Mechanic	2 per shift plus 1 reliever in General shift	7	Upper Age limit: 40 years National Trade Certificate with two years experience in relevant field.
4	Electrician	1 per shift plus 1 reliever in General shift	4	Upper Age limit: 40 years National Trade Certificate with two years experience in relevant field.
5	Fireman	2 per shift plus 1 reliever in General shift	8	Upper Age limit: 30 years Matriculation, Successful completion of certificate course on Basic Firefighting training from a Govt. Organization / Institution approved by Government. Two years' experience in relevant field. Medical Fitness certificate from a registered medical practitioner to be produced.
5	Housekeeping Staff	2 in General shift	2	Upper Age limit: 50 years 7th Standard pass and above.

1. The shift timing will be as follows:
   i. First Shift from 6 AM to 2 PM.
   ii. Second Shift from 2 PM to 10 PM.
   iii. Third Shift from 10 PM to 6 AM.
   iv. General Shift from 8 AM to 4 PM.
2. In each shift, one Shift in Charge, two Motor Mechanics, one Electrician and two Firemen shall be mandatorily available. During the weekly off of staff in each of the above category, the concerned reliever shall be posted in that shift to maintain the shift strength.
3. The Safety Officer and available relievers in each category and the House keeping staff shall attend General shift duty and shall avail weekly off.

8. Pattern of Uniform and details of PPE for each category:

A. Pattern of Uniform for each category		
Sl. No.	**Category**	**Dress Code**
1	Shift in charge	Flame proof white boiler suit
2	Safety Officer	Flame proof white boiler suit
3	Motor Mechanic	Flame proof Navy blue boiler suit
4	Electrician	Flame proof Navy blue boiler suit
5	Fireman	Flame proof Khaki Boiler suit
6	House Keeping Staff	As per Standard Practice.
B. Details of Personal Protective Equipments (PPE)		
1	Safety Shoes Black	
2	Safety Helmet with ventilation, ratchet, sweat band, chin strap	
3	Safety Apron and goggles	
4	Reflective Safety Vests (net type) shall be provided to the categories of workmen as per their nature of duty.	
5	Suitable type of Hand Gloves depending of their nature of duties	
6	Raincoat.	
Note: In case of damage to PPE, the contractor shall provide a new PPE to his workforce at his own cost. Contractor shall ensure the same by having spare stock of the PPEs.		

Appendix-4

MULT INVENTORY LIST - COMMON FACILITIES		
Sl. No.	**Common Facilities**	**Qty.**
1.Mult Road		
1	90 W LED Street lights (from SEZ road to MULT)	60
2	90 W Flame proof LED Street lights	11
3	90 W LED Light fitting on MULT cross over	1
4	45 W flame proof LED fitting on MULT cross over	1
5	Boom barrier	4
6	Cabin fan (Luminous)- big security cabin	2
7	Light fittings -big security cabin- 2 inside, 1 outside	3
8	Boom barrier 1 and 2 cabin remote - in big security cabin	2
9	Cabin fan (Bajaj) -small security cabin at MULT and Barge	2
10	Light fittings -small security cabin- 1 inside in each cabin	2
11	Boom barrier 3 and 4 cabin remote -in small security cabin	2
12	Fresh Water tank 5000 l	2
13	Kirloskar Water Pump - 3.7 kw/5 HP, Type: KDS-538+, Sl. No. A17ALW002651, Size:65 x 50, LPS 7.4, Head range- 6 m-38 m, 3 phase, 50 hz, 400V, Induction motor	1
14	FRP hose box (750 mm x 600 mm x 250 mm)	9
15	MCP #12 (at MULT Jn.)	1
2. Fuel Station Compound		
1	Fuel transfer pump with motor and gear box – ROTOPUMPS – Sl. No.GHI181431, GH181432, 5 cub m/hr., 4.4 bar, rpm 447, 1.29 kw, 44 M head / Motor- Crompton greaves, M/C No:BEC2F4DJ, 3 phase induction, Ex"d", IP55, 415 V, 3.26 A, rpm 1415, , 1.5 kw(2 hp), 40 kg,Temp class 4 / Gear box - Radicon , Sl. No. M221457, M221458, 1.5 kw, oil grade 460, O/P rpm 447, Ratio 3.2	2
2	Fuel tank 20 m^3 with fittings	2
3	PRV for fuel line (set @5 kg/cm^2)-FAINGER LESER	1
4	Flame sensor #10	1
5	Gas detector #6	1
6	FRP hose box (750 mm x 600 mm x 250 mm)	2
7	Horn Loudspeaker 15W	1
8	Compound wall 90 W Flame proof LED light fittings	2
9	45 watt flame proof LED fitting	4
10	Earth clamp box with earth clamp	1
11	MCP #14	1
12	Fire water Pipe line 300 NB	38 m
	Civil items kept at Fuel Station Compound	
1	Chain link fencing(50x50x4mm)	50
2	Vertical post of ISA 75x75x8 mm&ISA 50 x 50 x 6 mm	197
3	Concertena coil 600 mm diabundle	134
4	RBT barbed wire	33
5	40 x8 mm thick FI strip	197
6	Geotextile mat 3100 (200 m roll)	3
7	Geotextile mat 3100 (100 m roll)	2
8	Geotextile mat 3100 (120 m roll)	1
9	Geotextile mat PR24 (200 m roll)	6

10	Geotextile mat PR24 (20 m roll)	1
11	Geotextile mat 3400 (60 m roll)	1
12	Concrete weight for buoy	2
3. Fuel Station Control Room		
1	Talk back field station	1
2	Display enclosure	1
3	45 W Flame proof LED Light fittings	4
4	Industrial emergency light	1 set
	Store items kept at Fuel Station Control Room	
1	Bollards-30T - MULT Jetty	2
2	Bollard Bolts- dia. 32 mm	10
4. DG Station Compound		
1	Transformer -UNIPOWER OIL COOLED TRANSFORMER-CLASS A, SL. NO: UTPL/5640, 1250 KVA, HV 11000V,LV-433, HV-65.61 A, LV 1666.8 A, 50 HZ	1
2	FRP hose box (750 mm x 600 mm x 250 mm)	2
3	Compound wall LED light fittings 25 W	3
4	30 W LED fitting	4
5	36 W LED lights at Transformer area	2
6	MCP #15	1
7	Fire buckets (transformer area)	3
5. VCB Panel Room		
1	VCB panel 11 KVA- Larsen & Toubro	1
2	LBS	1
3	UPS	1
4	RTCC panel	1
5	Earth Rod	1
6	HT Gloves	1 pair
7	Industrial emergency light	1 set
8	LED tube light 20 W	4
6. DG Station Building		
1	MV Panel	1
2	SYN Panel	1
3	APFC Panel	1
4	Power Panel 1	1
5	Main Lighting Panel	1
6	LDB3	1
7	LDB 4	1
8	PDB 1	1
9	Distribution panel Hitek	1
10	63 A 5 PIN Metal socket	1
11	Air circulator 180 W- HAVELLS	5
12	Horn loudspeaker 15 W	1
13	Talk back field station	1
14	DG set- Engine-CUMMINS INDIA, Engine Sl.No. 25430163(#1)/ 25430399(#2), QSN-14-G2, 6 cylinder inline,4S, radiator cooled, 486 HP(363 KW), 1500 RPM, Diesel sump capacity 500 lit., Date of mfg : 23-09-2017(#1) /01-10-2017(#2)	2
15	DG set - AC Generator - STAMFORD-, Type-HCI444F1, Sl.	2

	No.N17J437761/N17J437762, Salient pole self-excited, 380 KVA, 1500 rpm,415 V, 3 PH, 528.7 A, IP 23 Isolator panel-POWERICA 380 KVA, Sl. No. 01/PSM1/710250, 01/PSM1/710251, Type SPL	
16	Battery PULSE ULTRA lite- 12 volt 65 AH -2 Nos. / Exide xp1000-2 Nos.	4
17	Overhead Diesel tank - Capacity- 500 lit. (D 75 cm x L 125 cm)	1
18	LED Tube Lights- 20 W	22
19	Industrial emergency light-in rest room, Lighting panel room and DG room	3 set
20	Fire buckets	3
21	First Aid Kit box- in Lighting panel room and DG room	2
22	9 Kg Dry chemical powder extinguisher - M4/22, M8/22	2
7. Toilet-Gents		
1	Shower with angle cock	1
2	Long body tap	1
3	Wash basin, fill up tap with angle cock	1
4	European closet with flush tank and angle cock	1
5	Health faucet with angle cock	1
6	Urinal with angle cock	2
7	LED Tube light -20 W	2
8	Sintex tank- 1000 lit.	1
8. Toilet-Ladies		
1	Shower with angle cock	1
2	Long body tap	1
3	Wash basin, fill up tap with angle cock	1
4	European closet with flush tank and angle cock	1
5	Health faucet with angle cock	1
6	LED Tube light -20 W	1
9. MULT Approach Trestle		
1	Lamp posts M1 to M10 with Flame proof LED light fitting- 90 W	10
2	Control Building side wall LED light fittings 25 W-left and right	8
3	FRP hose box (750 mm x 600 mm x 250 mm)	5
4	PRV -Foam line-FAINGER LESER	1
5	MCP #5,#6,#7,#8,#11	5
6	Diesel tank 88 lit. with fittings	1
7	Diesel tank 480 lit. with fittings	3
8	Diesel tank 750 lit. with fittings	3
10. Fire Pump Room (Ground Floor)		
1	MCC panel (enclosing PLC- Allen Bradley)	1
2	Power distribution panel	1
3	Battery charging panel	1
4	UPS 2 KV (Supra)	1
5	Battery for UPS-Cummins Pulse ultra 2 X 12 v x 65 AH / Exide Powersafe plus 2 x 12 V x 42 AH	4
6	Exhaust fan	2
7	LED Tube Light fittings	20 sets
8	Horn loud speaker 15 W	1
9	Talk back field station	1
10	GSM dialler	1
11	Jockey pump- Kirloskar Brothers Ltd.-, 2017 April, Vertical turbine, RPM2900, Head 130.6 m, 144 m^3/hr, 2017 make, VT275HL-4 stage	2

12	Jockey Motor- Kirloskar Electric Co., M/c No: SL 16637-01 /16637-02, 90 KW, RPM 2960, 3 Phase induction, 415v, 50 Hz, AC	2
13	Foam transfer pump-Tushaco, Model: T1SH 1450.2 , Single screw bare pump, 250 RPM, 750 lpm@17bar, Sl. No. 1600537/1912,1913	2
14	Motor for foam transfer pump-Kirloskar, M/c No: SP 16665-01, 37 KW, 1474 RPM, 3PH, 415V, 50 Hz, AC	1
15	Gear box for Electrically driven foam pump-ELECON Input 1500 rpm, output 250 rpm, Sl. No. H57979	1
16	Diesel Engine for foam pump- Greaves cotton Ltd, 3G11T, 3 cyl, 4S, Turbocharged, 72 HP(52 KW) at 2200 RPM, Sl. No. 1208031701125, Mfg. 24/01/2017	1
17	Gear box for Engine driven foam pump -ELECON, Input 2200 rpm, output 250 rpm, Sl. No. H57703	1
18	Foam filling pump-KOEL domestic self-priming pump, 0.5 hp, 25x25mm, Sl. No. DD1840046649, Model No:MM1.2525.05.1.12	1
19	Pressure switch for Fire Pump and Jockey pump	10
20	Fire pump Engine-Cummins India, 480 hp at 1800 rpm, 6 cylinder vertical turbo charged, NTA855-F , Engine serial no: 25402749 - mfg. Feb 2017- #1) , 25423690 - mfg. Jan 2017 -#2) , 25423689 -mfg. Jan 2017 -#3)	3
21	Fire pump - Kirloskar Brothers Ltd., vertical turbine, 245.438 kw, 91m head, 750m^3/hr. @91 m head, Impeller dia. 425 mm, BHR42-22.5 DEG 2 stage , Sl. No: 153B917001-(#1-mfg. may 2017), Sl. No: 153B917002-(#2-mfg. may 2017), Sl. No: 153B917003-(#3-mfg. may 2017),	3
22	Gear box for 480 Engine- ELECON KAV225 , Speed ratio 1.2:1, Horizontal shaft speed 1800 rpm, Vertical shaft speed 1500 rpm, Oil grade- VG 220- 35-40 L, Sl No: WHG H58547 UP-CW,WHG H58546 UP-CW,WHG H58545 UP-CW	3
23	Fire pump Engine- Cummins India, 680 hp at 1800 rpm, 6 cyl vertical turbo charged,KTA-19-F, Engine serial no: 25423911 -mfg. march 2017- (#4) , 25423913 -mfg. march 2017-(#5) , 25423912 -mfg. march 2017- (#6) with Lubrication pump- 0.75 kw, 1400 rpm, IP55	3
24	Fire pump - Kirloskar Brothers Ltd., vertical turbine, 385.365 kw, 141 m head, 760m^3/hr. @141m head, Impeller dia. - 430 mm BHR42-22.5 DEG 3 stage, Sl. No: 153B917004 -(#4- mfg. may 2017), Sl. No: 153B917005 -(#5-mfg. may 2017), Sl. No: 153B917006 -(#6- mfg. may 2017)	3
25	Gear box for 680 Engine - ELECON KAV250,Speed ratio 1.2:1, Horizontal shaft speed 1800 rpm, Vertical shaft speed 1500 rpm, Oil Grade- VG 220- 45 Litres, Sl.No. WGH H58550 UP-CW,WGH H58548 UP-CW,WGH H58549 UP-CW	3
26	HOT crane 5 ton capacity Single Girder, Make: Indef Hercules hoists ltd-2017, Sl. No. P1718000005, Size: span 7.85 mx height of lift 5.817 mx travel length 50 m	1
27	Battery 12 volt, 180 AH, EXIDE XP1800 - 7 Nos. / EXIDE GOLD 180 R- 1 No. /Cummins Pulse ultra plus with SMPS charger - 24V x 32 AH Sl. NO. 1J01100274, 1I01100236 E214- 2 Nos. for FIRE PUMP ENGINES	10
28	Battery 12 volt, 88 AH, EXIDE XP880 for FOAM PUMP ENGINE	2
29	Battery charger for Foam pump Engine -OUTPUT 12 VDC, 10 A, INPUT 230 VAC with BOOST, FLOAT and BATT REV indication, Model-BCW-1210, Mfg.Yr. 09/2019, Shavison Electronics Pvt. Ltd.	1
30	Battery charger for Fire pump Engine -INPUT 230 VAC, 4.5 A, 50/60 Hz, Output 24 VDC, 20 A with BOOST, FLOAT and BATT REV indication,	6

	Model-BCD-2420, Mfg.Yr. 08/2020, Shavison Electronics Pvt. Ltd. Sl. Nos. 200800016,200800022, 200800023, 200800029,200800033 and 200800034.	
31	Fire bucket	3
32	First Aid Kit box	1
33	9 Kg Dry chemical powder extinguisher- M9/22, M19/22	2
11. First Floor-Foam Tank Room and Office		
1	SS Foam tank 20520 lit. with fittings- SS316L	2
2	Foam concentrate in Tank 1 and Tank 2 (3100 litres in each tank)	2
3	Chain pulley block- 3.2 ton	1
4	Horn loudspeaker 15 W	1
5	Air circulator- 180 W-Havells - in dining room	2
6	Multi sensor detector-white	6
7	Electronic sounder-red	1
8	MCP #9	1
9	Fire Escape hydrant with hose reel	1
10	FRP hose box (750 mmx 600 mmx 250 mm)	1
11	LED Tube Light fittings at Foam tank area	8 sets
12	Aluminium 2 step ladder- 10 ft.	1
13	Aluminium Movable platform-6 ft.	1
14	UPS 6 KV (Supra)	1
15	SMF-VRLA Battery for UPS- AMARON Quanta 12 V 65 AH Model-12AL065	10
16	False Ceiling Lights (big)	13
17	False ceiling lights (small)	10
12. First Floor- Common Toilet		
1	Shower with angle cock	1
2	Long body tap	1
3	Wash basin, fill up tap with angle cock	1
4	European closet with flush tank and angle cock	1
5	Health faucet with angle cock	1
6	Urinal with angle cock	2
7	Exhaust fan	1
8	LED tube lights	3
13. First Floor-Locker Room-		
1	IFSC (International shore connection)1 No.to be fitted in line by M/s Hitek	2
2	Composite hose 80 NB x 6 m	1
3	Ball valve 100 NB , #300	4
4	Collar 300 NB	4
5	Pyro-protect brand Fire hose 63 mmx 15 m - To be placed in Hose box by M/s Hitek	4
6	Hydrant valve Single headed outlet Size:75 mm inlet x 63 mm outlet, IS 5290 Type A (Gun metal)-To fitted in line by M/s Hitek	75
7	Gun metal branch with nozzle-To be fitted in line by M/s Hitek	2
8	Talk back field station	1
9	Horn loud speaker flameproof 15W	1
10	Multi sensor detector-white	3
11	Fire alarm panel sounder-red	1
12	Pr. gauge (range 0-30 kg/cm^2)-FWL-To be fitted in line by M/s Hitek	24

13	Pr. gauge (range 0-25 kg/cm^2) -To be fitted in line by M/s Hitek	14
14	Pr. gauge (range 0-21 kg/cm^2) -To be fitted in line by M/s Hitek	26
15	Pr. gauge (range 0-14 kg/cm^2) -To be fitted in line by M/s Hitek	4
16	Tool box	2
16.1	Double end spanner 6x7	2
16.2	Double end spanner 8 x 9	2
16.3	Double end spanner 10x11	1
16.4	Double end spanner 12x13	2
16.5	Double end spanner 14x15	2
16.6	Double end spanner 16x17	2
16.7	Double end spanner 17x19	2
16.8	Double end spanner 18x19	2
16.9	Double end spanner 20x22	2
16.10	Double end spanner 21x23	1
16.11	Double end spanner 22x24	2
16.12	Double end spanner 25x28	2
16.13	Double end spanner 30x32	2
16.14	Hammer	2
16.15	Adjustable spanner	2
16.16	Pipe Wrench	2
16.17	Screw Driver	2
17	Diesel Engine spares	1 lot
18	F lever	6
19	LED tube lights- 20 W	2
14. Second Floor-Control Room		
1	MCP #10	1
2	Air conditioner- Voltas Inverter AC- 183V DZU, Model-4502368/2018 with remote	1
3	Public address system panel with Panasonic phone(KX-DT543)	1
4	Main Fire Alarm panel	1
5	Mimic panel	1
6	Siren accept panel	1
7	Remote Tower Monitor control panel	1
8	Hook release Interface with server- Trelleborg Marine Systems	1
9	Hook release control station-Trelleborg Marine Systems	1
10	Weather Station	1
11	Current & Wave Sensor, Tide Sensor, Laser Sensor, Display Unit.	1
12	Monitor DELL- SVC Tag- BCHZ692 Express service code: 24700394342 -S/N:CN-04TFPN-72872-634-AAKB-A02	1
13	Wireless keyboard and mouse	1
14	Micro PC Desktop- DELL OptiPlex 3040	1
15	Printer - Canon Laser Multi-function printer- Image class MF241d-print,scan,copy,duplex	1
16	Table and chair	1
17	VHF Base station -Motorola , Model : AZM28JNN9RA2AN , Equip type: XiR M8668i VHF, Sl. No. 511TTP2178	1
18	Power supply for Base station - AXIOM, BM 100B, 13.5 V, 10 A	1
19	Walkie talkie with charging unit- MOTOROLA- Model No: AZH56JDN9RA1AN, Sl. Nos. 871TUVD725, 871TUVD819, 871TUPZ403, Equipment type: XIR P8668I VHF, 7.4 V rechargeable lithium ion battery,	3

	2900 mAh, Sl. Nos. 5000024163DB, 5000024276F4, 5000024389E0	
20	VHF Base station Antenna-Kenstel, Model KF 150-6, Freq. 145-155 MHz, Gain 6 dB, Jan 2018	1
21	Multi sensor detector-white	1
22	Siren 3 km range	1
23	Weather station-Trelleborg Marine Systems	1
24	Solar Aviation lamp	1
25	Water tank 1000 l	2
26	LED tube lights- 20 W	3
27	LED light 25 W Crompton	2
28	Stair case LED Tube lights- 20 W	9
15.MULT Jetty		
1	Talk back field station-1 berth+1 operator room	2
2	Horn loud speaker 15 W	2
3	Gas detector #1,#2,#3	3
4	Flame sensor #3,#4,#5	3
5	Flame proof LED Flood light on cross over -150 W	4
6	Lamp posts M11,M12,M17 with Flame proof LED light fittings-90W	3
7	Flameproof LED light fittings in operator room-45 W	3
8	Emergency Eye and face wash fountain and safety shower	1
9	Jumbo curtain nozzle- 6000 LPM, 150 NB, 7.8 kg/cm^2, 2017 make	2
10	MCP #2,#3	2
11	Water tank 200 lit.	1
12	Ground water monitor 3000 LPM(AIR FOAM MONITOR)-AAAGFM750	2
13	FRP hose box (750 mm x 600 mm x 250mm)	2
14	MVWS spray nozzle (k64) for Under deck dia. 15	72
16. BD(1/2)		
1	FRP hose box (750 mm x 600 mm x 250mm)	1
2	Horn loud speaker 15 W	1
3	MCP #1	1
4	Laser sensor Enclosure	1
5	Jumbo curtain nozzle-6000 LPM	1
6	Flame sensor #1,#2	2
7	Tower curtain nozzles 15 NB	3
8	Local control panel	1
9	Tower Monitor 6000 lpm-Water Foam Monitor(S	1
10	Tower Monitor 6000 lpm-Water Monitor	1
11	QRMH 3,4- Trelleborg Marine Systems, SWL 100 TON X 3	2
12	Lamp posts M13,M14 with Flame proof LED light fittings	2
13	Flame proof 90 W LED fitting	1
17. Walkway BD(1/2) to MD2		
1	Lamp posts with LED light fittings-25 W	5
18. MD2		
1	FRP hose box (750 mm x 600 mm x 250mm)	1
2	Display Board-Trelleborg Marine Systems	1
3	QRMH 2 -Trelleborg Marine Systems,SWL 100 Tonx 3	2
4	Lamp post M15 with Flame proof LED light fitting-90 W	1
19. Walkway MD2 to MD1		
1	Lamp posts with LED light fittings-25 W	3

20. MD1		
1	QRMH 1 -Trelleborg Marine Systems,SWL 100 Tonx 3	1
2	Lamp post M16 with Flame proof LED light fitting- 90 W	1
21. BD(3/4)		
1	FRP hose box (750 mm x 600 mm x 250mm)	1
2	Horn loud speaker 15 W	1
3	MCP #4	1
4	Laser sensor Enclosure	1
5	Jumbo curtain nozzle-6000 LPM	1
6	Flame sensor #6,#7	2
7	Tower curtain nozzles 15 NB	3
8	Local control panel	1
9	Tower Monitor 6000 lpm,11bar 6”ANSI 300FF-Water Foam Monitor(SILVANI)	1
10	Tower Monitor 6000 lpm,11bar 6”ANSI 300FFlpm-Water Monitor(SILVANI)	1
11	QRMH 5,6-Trelleborg Marine Systems, SWL 100 Tonx 3	2
12	Lamp posts M18,M19 with Flame proof LED light fittings- 90 W	2
13	Flame proof 90 W LED fitting	1
22. Walkway BD(3/4) to MD3		
1	Lamp posts with LED light fittings-25 W	5
23. MD3		
1	FRP hose box (750 mm x 600 mm x 250 mm)	1
2	QRMH 7 -Trelleborg Marine Systems ,SWL 100 Tonx 3	2
3	Lamp post M20 with Flame proof LED light fitting-90 W	1
24. Walkway MD3 to MD4		
1	Lamp posts with LED light fittings-25 W	3
25. MD4		
1	Current and wave sensor- Trelleborg Marine Systems	1
2	Tide sensor -Trelleborg Marine Systems	1
3	QRMH8- Trelleborg Marine Systems, SWL 100 Tonx 3	2
4	Lamp post M21 with Flame proof LED light fitting-90 W	1
26. Items to be shifted to MULT Store Room		
1	75 kg wheeled dry chemical powder extinguisher	12
2	50 Kg wheeled dry chemical powder extinguisher	2
3	9 Kg Dry chemical powder extinguisher (ABC type)	18
4	4.5 Kg CO2 type fire extinguisher	9
5	Foam type extinguisher (9 lit.)	5
6	Foam type extinguisher (50 lit.)	2
7	Pyroprotect brand Fire hose 63 mmx 15 m	70
8	Pyroprotect brand Fire hose 63 mmx 7.5 m	2
9	Gun metal branches with nozzles	36
27. Fire Water Lines - Cemented (8 mm thick) , wall thickness 6.35 mm		Approx. Length in M
1	450 mm Tower and Hydrant line header with valves	318
2	350 mm line from pumps to header with Gate valves and NRVs, Barge Jetty/Booster area hydrant line through FP room, Tower monitor line from service platform start to BDs.	103

3	300 mm hydrant line from MULT trestle to DG station with valves (including line to booster area)	292
4	Underground 300 mm hydrant line to DG station (at Fuel storage area, DG station and Manifold 1)	74
5	250 mm tower line from BD's to tower monitor's, hydrant line for MULT Jumbo Curtain and U/DECK with Gate valves and DVs	163
6	200 mm drain line from 450 mm header line, U/D line with Gate valves, DVs and double hydrant post	10
7	150 mm Jockey line to header, MULT hydrant posts, hydrant line from BDs to MDs, fuel station and DG station with valves and double hydrant posts	323
8	100 mm hydrant line to FEH and IFSC with Gate valves and DVs	17
9	80 mm SS engine cooling lines and FEH line with valves with valves and DVs	59
10	50 mm SS engine cooling lines, tower curtain line and drain line at BD(1/2) with valves	51
11	25 mm SS engine cooling lines	36
12	SS Under deck berth protection lines (network)	-
28. Foam line-SS		Approx. Length in M
1	100 mm Foam line from Foam tank to Foam pump and from Foam pump to MULT approach trestle with Gate valves and NRVs	38
2	80 mm Foam line from MULT approach trestle to Service platform	101
3	50 mm Foam return line and inline balance proportionator line at BD1/2, BD3/4	109
4	25 mm Foam filling line with tank fittings,Foam line to Ground water /foam monitors at MULT	77.5
29. Utility Line-MULT		Approx. Length in M
1	150 mm Potable water line valves (galvanized carbon steel A 53 GR-B #150)	250
2	80 mm Potable water line with IFSC	7
30. Fuel Oil Line		Approx. Length in M
1	80 mm Fuel oil line from Filling point to UG tanks with valves and fittings(CS #150 API 5L GR-B)	17
2	40 mm Fuel oil line from UG tank to DG set tanks and FP tanks with valves and fittings (CS #150 API 5L GR-B)	322
3	Underground 40 mm Fuel oil line infront of Fuel storage area and DG station	52
4	25 mm Fuel oil return line to UG tanks and Fuel oil distribution line to FP Diesel sub tanks and Engines with valves and fittings (CS #150 API 5L Gr. B)	130

31. List of Valves, NRVs etc. in Fuel Oil Line- Common Facilities			
Sl. No.	**Description**	**Qty.**	**Location**
1	80 mm #150 Ball valve	3	Fuel tank inlet-3
2	80 mm #150 Y type strainer	1	Fuel station-1
3	40 mm #150 Ball valve	12	Fuel station – 2

			Outside left/ right-2 DG sub tank -1 FP Diesel sub tank inlet-7
4	40 mm #150 NRV	2	Fuel station-2
5	25mm #150 Ball valve	3	PRV line to tank-3
6	15 mm #150 Gate valve	21	FP Diesel sub tank drain-7 FP sub tank level gauge -7 Diesel engine inlet-7
7	15 mm # 150 Ball valve	2	Fuel station pressure gauge point-2
8	PRV dia. 25 mm set@ 5 kg/cm^2	1	Fuel station-1

31. List of Valves, NRVs, DVs in Fire Water / Foam Line - Common Facilities

Sl. No.	Description	Qty.	Location
1	450 mm dia., #150	3	Hydrant to Tower Inter Connection -1 MULT Trestle -2
2	350 mm dia., #150	6	FP1,FP2,FP3,FP4,FP5,FP6
3	300 mm dia., #150	6	FP Room to MULT Jn. -1 MULT Jn.toManifold1-1 Manifold1 toBooster Area-1 MULT Jn.toFuel Station -1 DG RoomtoManifold2 -2
4	250 mm dia., #150	8	JC1,JC2,JC3,JC4, BD1,BD2- Behind DV forWater Foam and Water Monitors (4)
5	200 mm dia., #150	3	Underdeck Line -1 FP Room Side Drain -2
6	150 mm dia., #150	27	MULT Approach Trestle -4 Jockey-2 FP Side Path -1 Service Platform Ground Monitor-2 SP Hydrant-2 Hydrantsfor BD(1/2),BD(3/4),MD2,MD3 - 4 MULT Jn.toManifold1-1 Manifold1-4 Fuel Storage Area-2 MULT Jn. toFuel Storage-2 Fuel Storage to DG Room -1 DG Room -2
7	100 mm dia., #150	8	MULT IFSC- 1 FEH-1 Foam Pump Intake Line -2 Foam Pump Delivery -2 Foam Tank Delivery -2
8	80 mm dia., #150	13	Engine Cooling Line -12 Foam Line to MULT Turning -1
9	50 mm dia., #150	6	Drain Line at BD1-1 Foam Recirculation Line -1 Foam Tank Inlet - 2 Foam Tank Drain -2
10	40 mm dia., #150	1	Foam Line Isolation Valve to Barge Jetty

11	25 mm dia.	6	To Ground Water Foam Monitors of Service Platform -2 Foam Tank Bottom for Level Gauge -4
12	15 mm dia.	2	Foam Tank Level Gauge Drain Point -2
13	NRV 350 mm , #150	6	FP1,FP2,FP3,FP4,FP5,FP6
14	NRV 150 mm , #150	4	Jockey Line -4
15	NRV 100 mm , #150	2	Foam Pump Delivery -2
16	DELUGE VALVE 200 MM, #150	9	Tower Monitor Line -4 JC - 4 Underdeck – 1
17	Solenoid operated valve – MULT(Flow control valve-Rotex)	11	MULT-Tower Monitor Line -4 JC – 4 Underdeck -1 Foam line-2
18	Y Type strainers 100 mm, #150	2	Foam pump line-2
19	Y Type strainers 80 mm, #150	6	Fire pump -6
20	Inline balance proportionator	2	BD(1/2)-1 BD(3/4)-1

32. List of Valves in Fresh water line- Common Facilities			
Sl. No.	**Description**	**Qty.**	**Location**
1	150 mm #150 Gate valve	1	MULT bridge Junction.
2	80 mm #150 Gate valve for IFSC	1	Service platform.
3	25 mm #150 Gate valve	2	Rest room side and shower

Appendix-5

MULT NON-LPG INVENTORY LIST		
Sl. No.	**Non- LPG Cargo handling facilities**	**Qty.**
1.MULT Road		
1	90 W Flame proof LED Street lights	12
2	90 W LED Light fitting on Barge cross over	1
3	45 W flame proof LED fitting on Barge cross over	1
4	MCP #16 (at Barge Jn.)	1
2. Manifold 1		
1	Electric Reciprocating Air compressor - Kirloskar Pneumatic Co. Ltd, Sl. No. REC003884,Single stage, 2 cylinder, dia. 250mm, Reciprocating, Balanced, Opposed piston type, Horizontal, Non-lubricated, water cooled, Model:1HA2T-730 rpm, Output pressure-3kg/cm^2, Free Air Delivery-625 CFM(17.69m^3/min), Motor-75 KW, 415 V, 50 HZ, 1500 RPM.	1
2	Compressor after cooler-Kirloskar Pneumatic Co. Ltd. (Sl. No. 788, Design pressure 5.5 kg/cm^2 shell)with safety valve	1
3	Air Receiver tank - Kirloskar Pneumatic Co. Ltd., 1000 lit., Sl. No. R18061120 with safety valve(max. working pressure 7 Kg/cm^2,Sl. No. 1805052) and Pr. Gauge(0-17.5 kg/cm^2 Fiebig)	1
4	Air Dryer, Kirloskar Pneumatic Company, Model No: KRD1000, Sl. No. 0033, Capacity-27.9 m^3/min, 415 V, Working Pr. 16 bar-Refrigerated type, Pressure dew point- 3-7 ^{0}C.	1
5	Starter cum Control panel, Sl. No. CEPL/16/2018-19	1
6	Sintex tank 500 lit.	1
7	Water pump- Crompton -MINI SAPPHIRE 2, 0.5 hp, 25x25 mm.	1
8	Gas detector #4,#5	2
9	Flame sensor #8,#9	2
10	Horn loudspeaker 15 W	1
11	Talk back field station	1
12	Display enclosure	1
13	Remote PLC panel	1
14	Nitrogen cylinder 80 lit.	3
15	Pressure regulator for Nitrogen cylinder (set@1.6 kg/cm^2)	1
16	Compound wall LED light fittings- 90 W	6
17	Flame proof LED light fittings -45 W	12
18	Pig receiver	2
19	PRV -Pig receiver fitting (set@ 2.5 kg/cm^2)-FAINGER LESER	2
20	Pr. Transmitter on Pig receiver and product line (0-16 kg/cm^2)	4
21	Pig signaller-Flag type, Setting 1450 psi	2
22	Temperature transmitter on BO line	1
23	TRV- product line (set@ 18 kg/cm^2)-FAINGER LESER	2
24	FRP hose box (750 mm x 600 mm x 250 mm)	4
25	Slop tank 20 KL (CS to IS 2062 GR B with external FRP coating) with fittings	1
26	Slop pump with motor and gear box-ROTO PUMPS Sl. Nos. GH181381 and GH181383 20 m^3/hr, 2.5 bar,25MH, rpm 405, 4.69kw / Motor - Crompton	2

	Greaves,3 phase induction, IP55,Ex"d", 5.5 kw (7.5 hp), 415V, 10.6 A, M/C No: BEG7-5F4DJ, 110 kg, Temp class 4 Gear box- Radicon, Sl. Nos. M221450 and M221452 5.5 KW, Oil grade 460, O/P rpm 405, ratio 3.58	
3. Manifold 2		
1	Electric Reciprocating Air compressor - Kirloskar Pneumatic Co. Ltd, Sl. No. REC003885, Single stage, 2 cylinder, dia. 250mm, Reciprocating, Balanced, Opposed piston type, Horizontal, Non-lubricated, water cooled, Model:1HA2T- 450 rpm, output pressure - 3kg/cm^2, Free Air Delivery-385 CFM(10.9 m^3/min). Motor- 45KW, 415 V, 50 HZ, 1500 RPM.	1
2	Compressor After cooler-Kirloskar Pneumatic Co. Ltd. (Sl. No. 787, Design pressure 5.5 kg/cm^2 shell)with safety valve.	1
3	Air Receiver tank -Kirloskar Pneumatic Co. Ltd, 1000 lit., Sl. No. R18061119 with safety valve(max. working pressure 5 kg/cm^2, Sl. No. 1712101) and Pressure Gauge(0-17.5 kg/cm^2 Fiebig).	1
4	Air Dryer, Kirloskar Pneumatic Company, Model No: KRD 600, Sl. No. 0033,Capacity-27.9 m^3/min, 415 V, Working pressure 16 bar-Refrigerated type, Pressure dew point- 3-7 ^{0}C	1
5	Starter cum Control panel	1
6	Sintex tank 500 L	1
7	Water pump – Crompton-MINI SAPPHIRE 2, 0.5 hp, 25x25 mm	1
8	Gas detector #7,#8	2
9	Flame sensor #11,#12	2
10	Horn loudspeaker 15 W	1
11	Talk back field station	1
12	Display enclosure	1
13	Remote PLC panel	1
14	Nitrogen cylinder 80 lit.	3
15	Pressure regulator for Nitrogen cylinder (set@1.6 kg/cm^2)	1
16	Compound wall LED light fittings-90 W	6
17	Flame proof LED light fittings- 45 W	12
18	Pig receiver	2
19	PRV- Pig receiver fitting (set@ 2.5 kg/cm^2)-FAINGER LESER	2
20	Pr. Transmitter on Pig receiver and product line (0-16 kg/cm^2)	4
21	Pig signaller-Flag type, Setting 1450 psi	2
22	Temperature transmitter on BO line	1
23	TRV- product line (set @ 18 kg/cm^2)-FAINGER LESER	2
24	FRP hose box (750 mm x 600 mm x 250 mm)	4
25	Slop tank 20 KL (CS to IS 2062 GR B with external FRP coating) with fittings	1
26	Slop pump with motor and gear box - ROTO PUMPS Sl. Nos. GH181380 and GH181382 20 m3/hr, 25MH, 4.69 KW, 2.5 bar, 405 rpm / Motor-Crompton Greaves, 3 phase induction Ex"d", 5.5 kw (7.5 hp), 1450 rpm, 10.6 A, IP 55, 110 kg, M/C No: BEG7.5F4DJ,Temp class 4 Gear box - Radicon, Sl. Nos. M221449, M221451 5.5 kw, O/P rpm -405, ratio 3.52, Oil grade 460	2
27	Hose pipe 300 NB X 5 m -for both manifolds (2 Nos. per line)	8
28	Hose pipe 250 NB X 6 m - for service platform (3 Nos. per line)	6

29	Hose pipe 200 NB X 6 m -for Barge Jetty (3 Nos. per line)	6
4.Barge Approach Trestle		
1	Lamp posts B1 to B6 with Flameproof LED light fittings-90 W	6
2	FRP hose box (750 mm x 600 mm x 250 mm)	3
3	Flow meter-Model UFM, Sl. Nos. 18803339 and18803343 Range- 0-1200 m^3 /hr (external clamp type non- protruding)	2
4	MCP #17,#18,#19	3
5. Barge Jetty		
1	Emergency Eye and face wash fountain and safety shower	1
2	Water tank- 200 lit.	1
3	LED Light fitting in operator room-45 W	3
4	Gas detector #9,#10	2
5	Flame sensor #13,#14,#15,#16	4
6	FRP hose box (750 mm x 600 mm x 250 mm)	2
7	Ground water foam monitor 3000 LPM (Air Foam Monitor)-AAAGFM750	2
8	MCP #20,#21,#22,#23	4
9	Horn loud speaker 15 W	2
10	Talk back field station-1 on jetty/1 inside operator room	2
11	Jumbo curtain nozzle 1000 LPM, 80 NB, 5.5 kg/cm^2, 2017 make	2
12	Stripper pump with motor and gear box -ROTO PUMPS- 5 m^3/hr, 3 BAR, 30 MH, 1.13 kw, 447 RPM, Sl. Nos. GH181466 and GH181469 Gear box - 1.5 kw, ratio3.21, O/P rpm 447, oil grade 460, Sl. No. M221459 and M221462/ Motor-Crompton Greaves, 3 PH Induction motor, Ex "d", 1.5 KW, rpm 1415, A 3.26, IP 55, 40 KG, M/C No. BEC2F4DJ.	2
13	Pressure transmitter in stripper line- 1 IN/1 OUT (0-16 kg/cm^2)	2
14	Slop oil line sight flow glass (SFG)	1
15	Slop tank 2 KL (CS to IS 2062 GR B with external FRP coating) with fittings	1
16	Slop pump with motor and gear box - ROTO PUMPS – Sl. Nos. GH181433 and GH181434, 5m^3/hr, 38MH,1.41 KW, 3.8 bar, 367 rpm Motor-Crompton Greaves,3 phase induction Ex"d",2.2kw(3 hp), 1430 rpm, 4.55 A, IP 55, 54 kg, M/C No: BED3F4CJ,Temp class 4 Gear box - Radicon, Sl. Nos. M221455 and M221456,2.2 kw, O/P rpm -367, ratio 3.95, oil grade 460	2
17	TRV-product line (set @ 18 kg/cm^2)-FAINGER LESER	2
18	Pig launcher	2
19	PRV- Pig launcher fitting (set@ 2.5 kg/cm^2)-FAINGER LESER	2
20	Pressure transmitter on Pig launcher and product line (0-16 kg/cm^2)	4
21	Temp transmitter in BO line	1
22	Lamp posts B7 to B13 with Flame proof LED light fittings-90 W	7
6. MULT Approach Trestle		
1	Flow meter- Model UFM, Sl. Nos. 18803340 and 18803337 Range -0-1200 m^3/hr. (external clamp type non- protruding)	2
7. First Floor-Locker Room		
1	IFSC (International shore connection)2 Nos. to be fitted in line by M/s Hitek	3

2	Flexible hose 25 NB x 6 m	4
3	Flexible hose 80 NB x 6 m	2
4	Flexible hose 100 NB x 6 m	2
5	Pipe cleaning Pig	2
6	PIG stopper rod	2
8.MULT Jetty		
1	Pig launcher	2
2	PRV- Pig launcher fitting (set@ 2.5 kg/cm^2)-FAINGER LESER	2
3	Pressure transmitter on Pig launcher and product line (0-16 kg/cm^2)	4
4	Temp transmitter on BO line	1
5	Pressure transmitter in stripper line- 1 in/1 out (0-16 kg/cm^2)	2
6	Slop oil line sight flow glass (SFG)	1
7	Slop tank 4 KL (CS to IS 2062 GR B with external FRP coating) with fittings	1
8	Slop pump with motor and gear box - ROTO PUMPS, Sl. Nos. GH181343 and GH181344, 10 m^3/hr, 3.26 KW, 60MH, 6 bar, 367 rpm Motor-Crompton Greaves, 3 phase induction Ex"d", 3.7 kw (5 hp), 1450 rpm, 7.47 A, IP 55, 73 kg, M/C No: BEE5F4CJ, Temp class 4 Gear box- Radicon, Sl. Nos. M221453 and M221454, 3.7 kw, O/P rpm -367, ratio 3.95, oil grade 460	2
9	Stripper pump with motor and gear box -ROTO PUMPS – Sl. Nos. GH181467 and GH181468, 5 m^3/hr, 30 MH, 3 bar, 1.13 KW,RPM 447 Motor-Crompton Greaves, 3 phase induction Ex"d", 1.5kw (2 hp), 1415 rpm, 3.26 A, IP 55, 40 kg, M/C No: BEC2F4DJ,Temp class 4 Gear box Sl. Nos. M221460 and M221461, 1.5 kw, oil grade 460, O/P rpm 447, gear ratio 3.21	2
10	TRV - Product line (set@ 18 kg/cm^2)-FAINGER LESER	2
9. Product Line-MULT Jetty		Approx. Length in M
1	ND 300 mm WO line with valves and fittings (CS #300 API 5L Gr. B, Wall thickness 9.53 mm, OD 323.9 mm, ID 304.8 mm)	257
2	ND 300 mm BO line insulated with valves and fittings (CS #300 API 5L Gr. B, Wall thickness 9.53 mm, OD 323.9 mm, ID 304.8 mm)	253
3	100 mm rain water/spillage line to slope tank with valves	1
4	80 mm drain line to stripper pump with valves and fittings	14
5	50 mm Pig launcher drain to stripper pump with valves and NRVs, TRV line, Stripper pump delivery line to slop tank with valves and fittings and Slop return line with valves and NRVS to Manifold1	286
10. Product Line - Manifold 1		Approx. Length in M
1	100 mm Pig receiver drain line to slope tank with valves and NRVs	44
2	80 mm drain line to slop tank line and slop transfer line to outside with valves	33
3	50 mm TRV overflow to slop tank line with valves and fittings	5
11. Product Line-Barge Jetty		Approx. Length in M
1	ND 300 mm WO line with valves and fittings(CS #300 API 5L Gr. B, Wall thickness 9.53 mm, OD 323.9 mm, ID 304.8 mm)	229
2	ND 300 mm BO line INSULATED with valves and fittings(CS #300	223

	API 5L Gr. B, Wall thickness 9.53 mm, OD 323.9 mm, ID 304.8 mm)	
3	100 mm rain water/spillage line to slope tank with valves	14
4	80 mm drain line to stripper pump with valves and fittings	13
5	50 mm Pig launcher drain to stripper pump with valves and NRVs, TRV line, Stripper pump delivery line to slop tank with valves and fittings and Slop return line with valves and NRVs to Manifold 2.	318
12. Product Line-Manifold 2		Approx. Length in M
1	100 mm Pig receiver drain line to slope tank with valves and NRVs	31
2	80 mm drain line to slop tank and Slop transfer line to outside with valves	31
3	50 mm TRV overflow to slop tank line with valves and fittings	5
13. Utility Line-MULT		Approx. Length in M
1	150 mm Compressed air line with valves (Galvanized carbon steel A 53 Gr. B #150)	250
2	80 mm Compressed air line	7
3	25 mm Nitrogen line with valves and fittings (carbon steel ERW A 106 Gr. B #150)	302
4	Underground 25 mm Nitrogen line inside Manifold 1	11
14. UTILITY LINE- BARGE		Approx. Length in M
1	150 mm Potable water line with valves (galvanized carbon steel A 53 Gr. B #150)	146
2	100 mm Compressor line with valves (galvanized carbon steel A 53 Gr. B #150)	246
3	80 mm Potable water line with IFSC and Compressed air line	4
4	25 mm Nitrogen line with valves and fittings (carbon steel ERW A 106 Gr. B #150)	253
5	Underground 25 mm Nitrogen line inside Manifold 2	11
15. Fire Water Lines - cemented (8 mm thick), wall thickness 6.35 mm		Approx. Length in M
1	300 mm hydrant line from DG station to Barge jetty with valves	324
2	250 mm line in Barge Jetty with Gate valves	119
3	200 mm hydrant line to Manifold 2 with Gate Valves and Double hydrant posts	50
4	150 mm line in Manifolds and Barge jetty with valves and double hydrant posts	180
5	80mm barge jumbo curtain line with valves and DVs	10
16. Foam line SS		Approx. Length in M
1	40 mm Foam line to Barge Jetty	629
2	40 mm Underground Foam line to Barge Jetty in front of Fuel storage area and DG station	52
3	25 mm Foam line at Barge Jetty	6.5

17. List of Valves,DVs etc. in Fire Water / Foam Line - Non LPG

Sl. No.	Description	Qty.	Location
1	250 mm dia., #150	1	Barge Jetty Entrance -1
2	200 mm dia., #150	1	Barge Jn. to Manifold2 -1

3	150 mm dia., #150	16	DG Room to Barge Jn. -4 Barge Jn. to Manifold2 -1 Manifold2- 4 Barge Approach Trestle -3 Barge Jetty -4
4	100 mm dia., #150	2	Barge IFSC- 2
5	80 mm dia., #150	2	Barge JC3,JC4-2
6	50 mm dia., #150	1	Barge Jetty End Lee Side as Drain Point -1
7	25 mm dia.	2	Barge Jetty -2
8	Deluge Valve 80 mm, #150	2	JC5,JC6-2
9	Solenoid operated valve-Barge (Flow control valve-Rotex)	4	JC5,JC6-2 Foam line-2

18. List Of Valves, NRVs and Fittings in Product Line -Non LPG

Sl.No.	Description	Manifold 1		Manifold 2		Service Platform		Barge Jetty		Total
		BO	WO	BO	WO	BO	WO	BO	WO	
Product Line										
1	300 mm, #300 Gate valve API 600	2	2	2	2	1	1	1	1	12
2	300mm, #300 Full Bore Gate Valve API6D	1	1	1	1	1	1	1	1	8
3	250 mm, #300 Gate valve to product hose API 600					1	1			2
4	250mm,#300 NRV to product hose					1	1			2
5	200mm, #300 Gate valve to product hose							1	1	2
6	200mm NRV,#300 to product hose							1	1	2
7	25 mm Gate valve - Air vent valve	1	1	1	1					4
8	15mm, #300 Ball valve for Pressure transmitter	1	1	1	1	1	1	1	1	8
9	Flow meter					1	1	1	1	4
10	Pressure transmitter	1	1	1	1	1	1	1	1	8
11	Temperature transmitter	1		1		1		1		4
		Pig Receiver				**Pig Launcher**				
1	100 mm, #300 Globe valve - on pig receiver/launcher top for compressed air	1	1			1	1			4
2	80 mm, #300 Globe valve - on pig receiver/ launcher			1	1			1	1	4

	top for compressed air									
3	25mm Gate valve on pig receiver/launcher top for PRV and Nitrogen line connection	3	3	3	3	3	3	3	3	24
4	15mm, #300 Ball valve for Pressure transmitter and Pressure gauge	2	2	2	2	2	2	2	2	16
5	PRV dia. 25 mm set@2.5 kg/cm^2 , #300	1	1	1	1	1	1	1	1	8
6	Pressure transmitter (0-16 kg/cm^2),#300	1	1	1	1	1	1	1	1	8
7	Pig signaller #300 Flag type	1	1	1	1					4
		Pig Receiver Drain				**Pig Launcher Drain**				
1	100 mm #150 Gate valve	1	1	1	1					4
2	100 mm NRV #150	1	1	1	1					4
3	50 mm #300 Gate valve					1	1	1	1	4
4	50 mm NRV #300					1	1	1	1	4
	Product Line Drain Line									
1	80 mm #300 Ball valve					1	1	1	1	4
2	80 mm #150 Ball valve	1	1	1	1					4
3	15 mm Ball valve for product hose drain					1	1	1	1	4
	TRV Over Flow Line									
1	TRV dia. 15 mm x 20 mm, #300 set@18 kg/cm^2	1	1	1	1	1	1	1	1	8
2	50 mm #300 Ball valve	1	1	1	1	1	1	1	1	8
3	50 mm #150 Ball valve	1	1	1	1	1	1	1	1	8
	Slop Tank									
1	100 mm #300 Ball valve	1 -drain line- slop tank inlet		1 -drain line- slop tank inlet		2 - drain water/ spillage		2 - drain water/ spillage		6
2	80 mm #150 Ball valve	3 slop pump outlet		3 slop pump outlet						6
3	80 mm NRV #150	2		2						4
4	50 mm #300 Gate valve					1 before SFG- slop		1 after SFG- slop tank		2

				tank inlet line	inlet line	
5	50 mm #300 Ball valve				2-slop pump outlet to manifold	2
6	50 mm NRV #150			2 -slop pump outlet line	2- slop pump outlet line	4
7	50 mm #150 Ball valve	1-slop return line - tank inlet	1-slop return line - tank inlet	2-slop pump outlet to manifold		4
8	15 mm Ball valve for Pressure gauge	1	1	1	1	4
9	Sight flow glass			1	1	2
	Stripper Line					
1	80 mm #300 Ball valve			2 IN	2 IN	4
2	80 mm Y type strainer #300			2 IN	2 IN	4
3	50 mm #300 Ball valve			2 OUT	2 OUT	4
4	50 mm NRV #300			2 OUT	2 OUT	4
5	15 mm Ball valve to Pressure transmitter			2 -(in/out)	2 -(in/out)	4
6	Pressure transmitter (0-16 kg/cm^2),#300			2 -(in/out)	2 -(in/out)	4
	Compressor Line					
1	150mm #150 Globe valve	2		1		3
2	100 mm #150 Globe valve		2		1	3
	Fresh Water Line					
1	150 mm #150 Gate valve		1(Barge bridge Jn.)			1
2	80 mm #150 Gate valve for IFSC				1 at barge jetty	1
3	25 mm #150 Gate valve				2 (rest room side and shower)	2
	Nitrogen Line					
1	25 mm #150 Globe valve	3 (1 to booster area)	2	1	1	7
2	Pressure regulator set@1.6 kg/cm^2	1	1			2

Note:- The Firms shall visit the site before submitting the Bud. Offer.

Bill of Quantities (BoQ)

Name & Address of the Firm:

Sl. No.	Description of work	Rate excluding GST
1	Carry out manning, operation, maintenance and repairs of Fire Fighting system as per the detailed Scope of Work given separately which include but not limited to as per the details given in the scope o work, for Three (3) Years Extendable for further period of one year at the same quoted rates and terms and conditions, at the discretion of the Employer as per the rate quoted for third year. Details as per the Annexure 1 shall also be submitted.	
1.1	First year	
1.2	Second year	
1.3	Third year	

Total Amount for Three years excluding GST

GST 18%

Total Amount for Three years including GST