# OIL INDIA LIMITED

**( A Govt. of India Enterprise )**
**4, India Exchange Place,**
**Kolkata – 700 001.**

**OIL INDIA LIMITED invites indigenous competitive bid through its e-procurement portal – https://etender.srm.oilindia.in/sap/bc/gui/sap/its/bbpstart/! for the following e-Tenders :-**

| Srl. No. | E-tender | Bid Closing Date | Materials Description |
|---|---|---|---|
| 1 | SKI2912P14 | 06-05-2014 | DCP Fire Tender (Composite Bid) |
| 2 | SKI2913P14 | 06-05-2014 (Technical Bid) | Foam Tender (Single Stage Two Bid System) |
| 3 | SKI2928P14 | 27-05-2014 (Technical Bid) | Process Monitoring & Control System (Single Stage Two Bid System with Pre-bid Conference) |

**2.0** Application showing full address / e-mail address with Tender fee (non-refundable) of **₹ 1000.00** per tender (excepting PSU and SSI units registered with NSIC) by Demand Draft in favour of M/s. Oil India Limited payable at Kolkata and to be sent to **Head-Calcutta Branch**, Oil India Limited, 4, India Exchange Place, Kolkata – 700 001 only and shall be accepted upto 29.04.2014. The envelope containing the application for participation should clearly indicate **"REQUEST FOR ISSUE OF USER ID AND PASSWORD FOR E-TENDER NO."** for easy identification and timely issue of authorisation. On receipt of requisite tender fee, USER_ID and initial PASSWORD will be communicated to the bidder (through-e-mail) and will be allowed to participate in the tender through OIL's e-Procurement portal. No physical tender documents will be provided. **Details of NIT can be viewed using "Guest Login" provided in the e-Procurement portal. The link to e-Procurement portal has also been provided through OIL's web site www.oil-india.com.**

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**OIL INDIA LIMITED**
**(A Government of India Enterprises)**
**PO : Duliajan – 786602**
**Assam (India)**
**TELEPHONE NO. 91-33 22301657/59**
**FAX NO: 91 33 22302596**
**Email: oilcalmn@oilindia.in ; erp_mm@oilindia.in**

# FORWARDING LETTER

**Tender No.** : **SKI2913 P14** **Date 18.03.2014**

**Tender Fee** : **Rs 1,000.00**

**Bid Security Amount** : **Rs. 367000.00**

**Bidding Type** : **SINGLE STAGE TWO BID SYSTEM**

**Bid Closing on** : **As mentioned in the e-portal**

**Bid Opening on** : **As mentioned in the e-portal**

**Performance Security** : **Applicable**

**Integrity Pact** : **Applicable**

Delivery Required: AT DULIAJAN, ASSAM.

OIL invites Bids for **CHASSIS OF FOAM TENDER & FABRICATION OF FOAM TENDER THEREOF & ACCESSORIES INCLUDING COMMISSIONING/ TRAINING** through its e-Procurement site under **SINGLE STAGE TWO BID SYSTEM**. The bidding documents and other terms and conditions are available at Booklet No. MM/CALCUTTA/E-01/2010. The prescribed Bid Forms for submission of bids are available in the Technical RFx -> External Area - > Tender Documents

The general details of tender can be viewed by opening the RFx [ Tender] under RFx and Auctions.. The details of items tendered can be found in the Item Data and details uploaded under Technical RFX.

**Note:-**

**The tender will be governed by:**

a) "General Terms & Conditions" for e-Procurement as per Booklet No. MM/CALCUTTA/E-01/2010 for E-Procurement LCB Tenders and Amendment No. 1 to General Terms and Conditions for Indigenous E-Tender.

b) Technical specifications and Quantity as per **Annexure – II**

c) The prescribed Bid Forms for submission of bids are available in the Technical RFx -> External Area - > Tender Documents.

d) In the event of receipt of only a single offer against the tender within B.C. date, OIL reserves the right to extend the B.C. date as deemed fit by the Company. During the extended period, the bidders who have already submitted the bids on or before the original B.C. date, shall not be permitted to revise their quotation.

e) Any sum of money due and payable to the contractor (including Security Deposit refundable to them) under this or any other contract may be appropriated by Oil India Limited and set-off against any claim of Oil India Limited (or such other person or persons contracting through Oil India Limited) for payment of sum of money arising out of this contract or under any other contract made by the contractor with Oil India Limited (or such other person or persons contracting through Oil India Limited).

f) Bidder are advised to fill up the Technical bid check list and Response sheet given in MS excel format in Technical RFx -> External Area - > Tender Documents. The above filled up document to be uploaded in the Technical RFX Response.

**Special Note:**

**1.0 General Qualification Criteria:**

In addition to the general BRC/BEC, following criteria on Bidders' Experience and their financial capabilities shall be considered **(documentary evidence to be provided along with the bid in** Technical RFx -> External Area - > Tender Documents**)** as on the Bid Closing Date:

a) Bidder should have experience of successfully executing similar order for at least **Rs. 1.10 Crores** during last 3 years.

b) Annual financial turnover of the firm in any of the last 3 financial years or current financial year should not be less than **Rs. 3.67 crores.**

2.0 Application showing full address / e-mail address with Tender fee (non-refundable) of ₹ 1000.00 per tender (excepting PSU and SSI units registered with NSIC) by Demand Draft in favour of M/s. Oil India Limited payable at Kolkata and to be sent to Head-Calcutta Branch, Oil India Limited, 4, India Exchange Place, Kolkata – 700 001. The envelope containing the application for participation should clearly indicate ""REQUEST FOR ISSUE OF USER ID AND PASSWORD FOR E TENDER NO **SKI 2913 P14** for easy identification and timely issue of authorisation. On receipt of requisite tender fee and subject to fulfilment of eligibility criteria, USER_ID and initial PASSWORD will be communicated to the bidder (through-e-mail) and will be allowed to participate in the tender through OIL's e-Procurement portal. No physical tender documents will be provided. USER_ID AND INITIAL PASSWORD WILL BE ISSUED TILL ONE WEEK PRIOR TO THE BID CLOSING DATE.

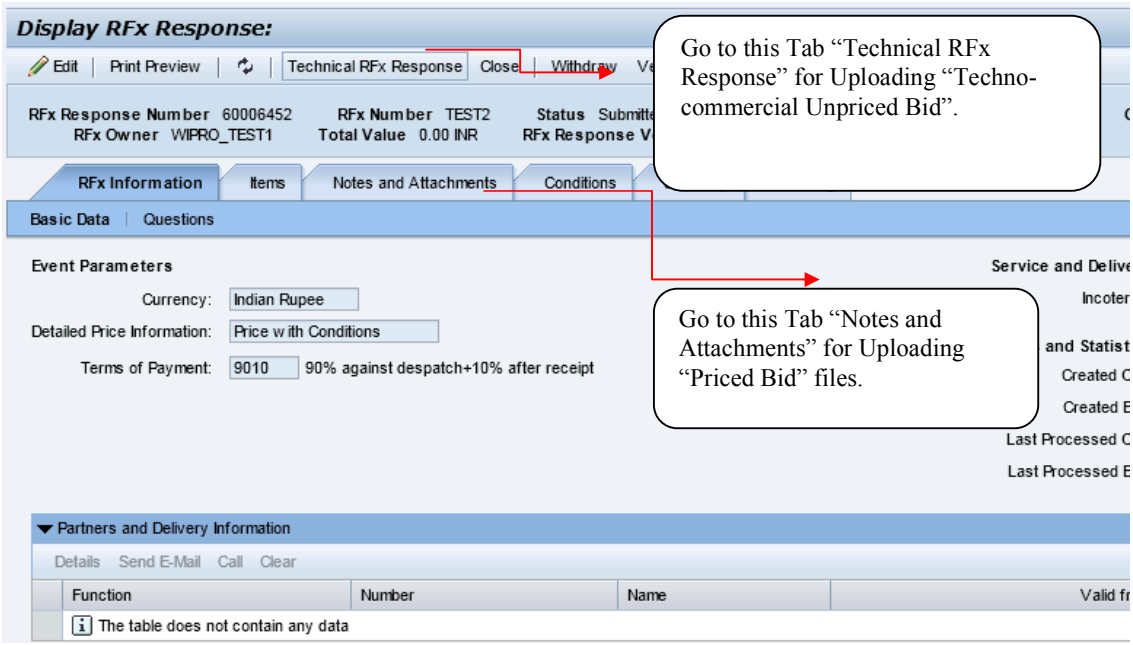
**3.0 The tender is invited under SINGLE STAGE-TWO BID SYSTEM. The bidders are required to submit both the "TECHNO-COMMERCIAL UNPRICED BID" and "PRICED BID" through electronic format in the OIL's e-Tender portal within the Bid Closing Date and Time stipulated in the e-Tender.**

**3.1 Please ensure that Technical Bid / all technical related documents related to the tender are uploaded in the** Technical RFx Response-> User - > Technical Bid only**.**

The "**TECHNO-COMMERCIAL UNPRICED BID**" shall contain all techno-commercial details **except the prices**. **Please note that no price details should be uploaded in** Technical RFx Response**.**

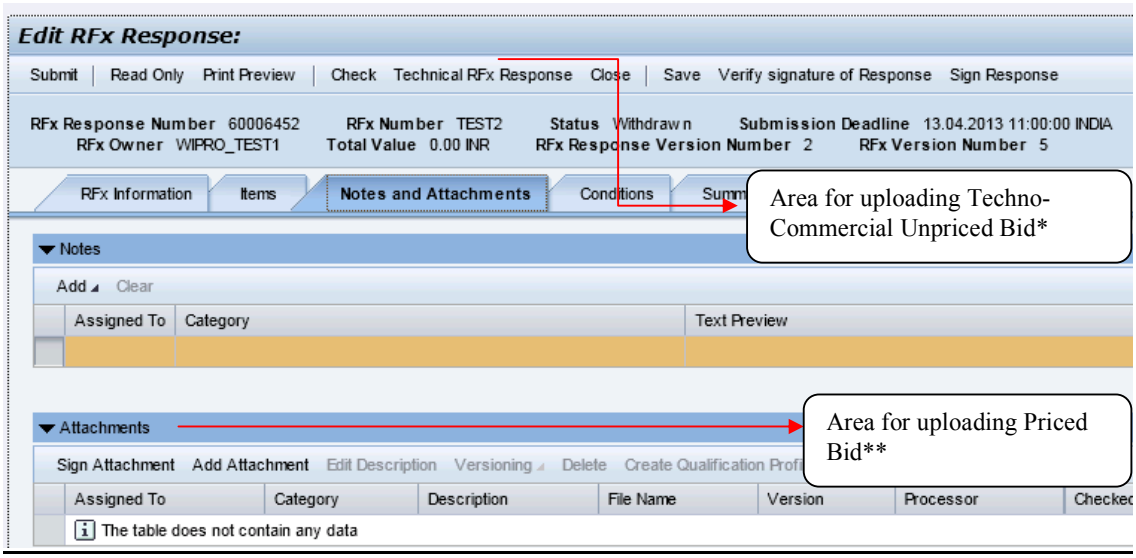
**3.2** The Price along with price related conditions should be submitted online as per **PRICE BID FORMAT**. All other technical documents to be submitted as per tender requirement in the '**Technical RFx response**. Price bid as per "price bid format" to be **uploaded as Attachment in the attachment link under "Notes & Attachments" Tab.**

**3.3 A screen shot in this regard is given below. Offer not complying with above submission procedure will be rejected as per Bid Rejection Criteria .**




**On "EDIT" Mode- The following screen will appear. Bidders are advised to Upload "Techno-Commercial Unpriced Bid" and "Priced Bid" in the places as indicated above:**

Bid on "EDIT" Mode




**Note :**

* The "Techno-Commercial Unpriced Bid" shall contain all techno-commercial details **except the prices**.

** The "Price bid" must contain the price schedule and the bidder's commercial terms and conditions. For uploading Price Bid, first click on Sign Attachment, a browser window will open, select the file from the PC and click on Sign to sign the Sign. On Signing a new file with extension .SSIG will be created. Close that window. Next click on Add Atachment, a browser window will open, select the .SSIG signed file from the PC and name the file under Description, Assigned to General Data and clock on OK to save the File.

4.0 Please note that all tender forms and supporting documents are to be submitted through OIL's e-Procurement site only except following documents which are to be submitted manually in sealed envelope super scribed with Tender no. and Due date to Head-Calcutta Branch, Oil India Limited, 4, India Exchange Place, Kolkata – 700 001 only on or before the Bid Closing Date and Time mentioned in the Tender.

a) Original Bid Security
b) Detailed Catalogue (if any)
c) Any other document required to be submitted in original as per tender requirement

All documents submitted in physical form should be signed on all pages by the authorised signatory of the bidder and to be submitted in triplicate

5.0 Bidders are requested to examine all instructions, forms, terms and specifications in the bid. Failure to furnish all information required as per the NIT or submission of offers not substantially responsive to the bid in every respect will be at the bidders risk and may result in rejection of its offer without seeking any clarifications.

6.0 **All the Bids must be Digitally Signed using "Class 3" digital certificate with Organisation's name *(e-commerce application)* as per Indian IT Act obtained from the licensed Certifying Authorities operating under the Root Certifying Authority of India (RCAI), Controller of Certifying Authorities (CCA) of India. The bid signed using other than "Class 3 with Organisation's Name" digital certificate, will be rejected.**

7.0 Bidders must ensure that their bid is uploaded in the system before the tender closing date and time. Also, they must ensure that above documents which are to be submitted in a sealed envelope are also submitted at the above mentioned address before the bid closing date and time failing which the offer shall be rejected.

8.0 Bid must be submitted electronically only through OIL's e-procurement portal. Bid submitted in any other form will be rejected.

9.0 **SINGLE STAGE TWO BID SYSTEM** shall be followed for this tender and only the PRICED-BIDS of the bidders whose offers are commercially and technically acceptable shall be opened for further evaluation.

10.0 **a) The Integrity Pact is applicable against this tender. OIL shall be entering into an Integrity Pact with the bidders as per format enclosed vide Annexure-V of the tender document. This Integrity Pact proforma has been duly signed digitally by OIL's competent signatory. The proforma has to be returned by the bidder (along with the technical bid) duly signed (digitally) by the same signatory who signed the bid, i.e., who is duly authorized to sign the bid. Any bid not accompanied by Integrity Pact Proforma duly signed (digitally) by the bidder shall be rejected straightway. Uploading the Integrity Pact with digital signature will be construed that all pages of the Integrity Pact has been signed by the bidder's authorized signatory who sign the Bid.**

**b) The name of the OIL's Independent External Monitors at present are as under:**

**i) SHRI N. GOPLASWAMI, I.A.S. (Retd.),**
**Former Chief Election Commissioner of India**
**E-mail Id : gopalaswamin@gmail.com**

**ii) SHRI RAMESH CHANDRA AGARWAL, IPS (Retd.)**
**Former Director General of Police**
**E-mail Id : rcagarwal@rediffmail.com**

13.0 The tender shall be governed by the Bid Rejection & Bid Evaluation Criteria given in enclosed Annexure-II. However, if any of the Clauses of the Bid Rejection Criteria / Bid Evaluation Criteria contradict the Clauses of the tender and / or "General Terms & Conditions" as per Booklet No. MM/CALCUTTA/E-01/2010 for E procurement (LCB Tenders) to General Terms and Conditions for Indigenous E-Tender elsewhere, those in the BEC / BRC shall prevail.

14.0 To ascertain the substantial responsiveness of the bid OIL reserves the right to ask the bidder for clarification in respect of clauses covered under BRC also and such clarifications fulfilling the BRC clauses in to must be received on or before the deadline given by the company, failing which the offer will be summarily rejected.

15.0 Please do refer the User Manual provided on the portal on the procedure How to create Response for submitting offer.

**NOTE:**

**1. Bidders should submit their bids explicitly mentioning compliance / non compliance to all the NIT terms and conditions.**

**Yours Faithfully**
**(D BHATTACHARJEE)**
**SENIOR MANAGER MATERIALS**
**FOR HEAD-CALCUTTA BRANCH**
**OIL INDIA LTD. KOLKATA**

**OIL INDIA LIMITED**
**(A Government of India Enterprise)**
**4, India Exchange Place, 4th floor,**
**Kolkata 700001,**
**West Bengal (India)**

**TELEPHONE NO. (033) 2230 1657 / 58 / 59**
**FAX NO: (91-033) 2230 2596**
**Email : oilcalmn@oilindia.in**
**oilcalmn@dataone.in**

## ANNEXURE-II

**Tender No& Date : SKI 2913 P14 DATED 18.03.2014**
**Tender Fee : 1000.00 INR**

**Bid Security Amount : 3,67,000.00 INR**

**Bidding Type : SINGLE STAGE TWO BID SYSTEM**

**Bid Closing on : As mentioned in the Basic Data of e-portal**
**Bid Opening on : As mentioned in the Basic Data of e-portal**

**Performance Guarantee : Applicable**

**OIL INDIA LIMITED invites Indigenous tenders for items detailed below:**

**TECHNICAL SPECIFICATIONS WITH QUANTITY**

| SLNO & MATERIAL CODE NO. | MATERIAL DESCRIPTION. | QUANTITY | UNIT |
|---|---|---|---|
| 10<br>----------<br>0C000198 | **Chassis of Foam Tender**<br>**DETAILED SPECIFICATIONS AS UNDER (ANNEXURE 1 PARt - A)** | 02 | No. |
| 20 | | | |

| | | | |
|---|---|---|---|
| 0C000198 | **Fabrication of Foam Tender & Accessories**<br>**DETAILED SPECIFICATIONS AS UNDER (ANNEXURE 1 PART -B)** | 02 | NO |
| 30<br>--------- | **Commissioning & Training** | 1 | AU |

**Annexure-I**

**SPECIFICATION FOR "FOAM TENDER" WITH CHASSIS, FABRICATION & ACCESSORIES**

**Part – A "Chassis"**

**TRUCK CHASSIS**:

Brand New Volvo FM 400 (6x4 drive) Truck chassis manufactured not prior to six months from the date of issuance of Letter of Intent (LOI). The bidder shall take special care in selecting and designing the platform considering the unit's application in rough terrain and typical oilfield roads. The offered model shall be latest and conforming to international quality standard norms, having specifications, fittings, accessories, etc. as under –

**1. DIMENSION (COMPLETE UNIT)**

Overall Width - Should not exceed. 2.6 meter
Overall Height – Approx. 4.3 meter
Overall Length – Approx. 10 meter

Minimum Ground Clearance – approx. 30.0 cm. It shall be bidder's endeavour to mount subsequently fitted undercarriage components (i.e. other than originally mounted components) at maximum possible height.

**2. ENGINE**

Water-cooled, diesel engine of Volvo make with adequate power (not less than 400 HP at rated rpm) & torque ( not less than 2000Nm in the range 1050-1400rpm) suitable for road drive as well as Fluid Pumping operation. The engine shall conform to minimum EURO-III or equivalent Emission Norms.

**3. TRANSMISSION**

Suitable mechanical gear box as per design with high low range selector. Suitable Transfer Case & other PTO's as per design/requirement. In case of any modification in the driveline

for accommodating Transfer case (for chassis without transfer case), modified design has to be approved by the chassis manufacturer such that warranty of the vehicle is not affected.

## 4. DRIVE & STEERING

**Drive** - 6X4 Drive (One Single non powered front axle & two Powered rear axles).

**Steering** - Right hand drive Hydraulic Power Assisted Steering (Steering wheel on the right hand).
**Turning Radius** - Minimum Turning Radius approx. 16.00 meters.

## 5. SUSPENSION, GVW & AXLES

**A. Front Suspension** - Heavy Duty Multi-Leaf Spring Suspension of suitable design with Shock Absorbers.

**B. Rear Suspension** –Heavy Duty Leaf Spring Suspension as per design with boggy axle & Shock Absorbers.

**C. Laden Weight** - Within 30,000 Kg

**Front Axle Capacity** - As per Design

**Rear Axle Capacity** - As per Design

**D.** Rear Axles shall have Inter Axle & inter differential Lock facility.

**E.** Actual loading on each individual axle (front as well as rear) shall be within 85% (eighty-five percent) of the maximum load bearing capacity i.e. *Axle Capacity* of the respective axle.
**i.e. Laden Weight of the unit shall be within 85% (eighty-five percent) of *Maximum Permissible Gross Vehicle Weight* (i.e. sum of Axle Capacities of all axles i.e. GVWR) of the unit.**
[Laden Weight means – Weight of the complete unit with all equipment & fittings i.e. weight of the chassis with driver's cabin + weight of all pumping equipment permanently mounted on the unit + weight of other tools, accessories, etc. generally being carried/kept in the unit, spare wheels, hydraulic & diesel oil, etc. Accordingly, Laden Weight is the sum of actual loading on each individual axle.]

## 6. WHEELS & RIMS

Suitable wheels (2 Nos. at Front Axle, 8 Nos. at Rear Axles) with Tube & Tyre of adequate ply rating with **two sets of complete spare wheels** (even in case of same front & rear wheels).

It shall be bidder's endeavour to offer front and rear wheels of same size & type. If not possible for design constrain, two spare wheels - one for each type shall be supplied. Suitable lifting & mounting arrangement facility for spare wheels shall be provided.

## 7. BRAKE

**A. Service Brake** - Multiple Circuit Pneumatic S/ Z-Cam brake acting on all wheels.

**B. Parking/ Emergency Brake** - Parking Brake operating through hand operated shifter valve. It shall automatically get engaged in the event of low/ no air pressure.

**C.** All Emergency / Parking Brake Servos shall have manual release mechanism (Screw Type) to release the brake manually in case of low/ no air pressure for maintenance.

**D.** All air tanks shall have Drain Plugs.

**E.** All wheel brake drums shall have Dust Cover.

**F.** Buzzer warning for low air pressure.

## 8. FUEL TANK

Fuel tank as per Volvo FM 400 specification.

## 9. DRIVER'S CABIN

Factory build (original built & supplied with chassis by chassis manufacture) ergonomically designed floating steel / aluminum driver's cabin complete with all standards fittings.

## 10. OTHER FITTINGS & ACCESSORIES

- **A.** Sufficient Side marker lights, Hazard warning lights, rear & side reflectors, Air horn in additional to electric horn, etc. for safe movement of the unit on road.
- **B.** While all lights shall be covered to the extent possible with suitable guard to prevent damage; all electrical fittings/ components/ connections shall be suitable to operate in oilfield area.
- **C.** Gauges & meters including Engine Tachometer & Hour meter as per standard inside driver's cabin. Speedometer & Odometer with metric KM calibration only. Two Nos. fans inside driver's cabin.
- **D.** It shall be bidder's endeavor to provide the Engine Oil Pressure & Temperature meters, Air pressure meter, Transmission oil pressure & Temperature meters (if any) with high low warning buzzers.
- **E.** Suitable Reversing Audio Alarm with Blinker lights at rear of the unit.
- **F.** Suitable Air Dryer with replaceable type filter element for truck's pneumatics.
- **G.** Well covered & non conducting material wrapped Vertical Exhaust located behind and projected above the top of the driver's cabin.
- **H.** Suitable heavy duty front & rear Towing Hook capable of pulling/towing the unit from bogged down situation in slushy areas in oilfields from front as well as rear.
- **I.** Suitable electrical Master Switch to disengage all electrical circuits from battery.
- **J.** Well covered Battery Box, Standard Tool Kit in a portable box for general maintenance of the truck, heavy duty grease gun, wheel wrench & handle, 2(two) Nos. min. 30 MT capacity hydraulic jack with handle, 2 (two) Nos. stopper block for rear wheels.
- **K.** Fire Extinguisher & First Aid Box inside the driver's cabin.
- **L.** Suitable PESO/CCE approved spark arrestor for engine exhaust for operation in oilfield area.

## 11. SPARES

### 11.1 COMMISSIONING SPARES:

The Supplier has to supply all the spare parts required for initial commissioning of the unit.

### 11.2 OPERATIONAL CRITICAL SPARES:

Supplier shall supply the following operational critical spares along with the supply of the UNIT:

### i) AUTOMOBILE SPARE PARTS LIST:

Following spares in specified quantity as indicated shall be supplied along with the unit. Specific description, part Nos., Make etc. & unit price of each & every spares shall clearly be indicated in the bid for bid evaluation.

**A. ENGINE**

1. Fuel Filter Element - 03 Nos.
2. Water Separator Filter Element - 03 Nos.
3. Engine Lubrication Oil Filter Element - 03 Sets
4. Air Filter Element - 03 Sets
5. Fan Belt - 02 Sets
6. Alternator Belt - 02 Sets
7. Water Hose - 02 Sets
8. Engine Mounting - 01 Set

**B. TRANSMISSION –**

1. Transmission Filter Element - 02 Sets
2. Gear Selector (one inside driver's Cabin) - 01 No.

**C. TRANSFER CASE (if any) & POWER TAKE OFF (PTO)**

1. Oil Filter Element, if any - 02 Sets

**D. FRONT AXLE**

1. Wheel Stud with Nuts - 20 Nos.
2. Wheel Hub Bearing - 01 Set*

(* set comprising of items for one wheel)

**E. REAR AXLE**

1. Wheel Stud with Nuts - 20 Nos.
2. Wheel Hub Bearing - 02 Sets*

(* set comprising of items for one wheel/differential)

**F. DRIVELINE (Propeller Shaft)**

1. UJ Cross (Spider & Bearing) - 01 Set*

**G. STEERING –**

1. Steering Oil Filter Element - 02 Sets
2. Tie Rod End (for both sides) - 02 Sets

**H. BRAKE & PNEUMATICS**

1. Foot Brake Valve Repair Kit - 02 Sets
2. Air Dryer Filter Element - 04 Nos.
3. Repair Kit for all Pneumatic Valves - 01 Set each

**I. ELECTRICAL**

1. Engine Starter - 01 No.
2. Alternator - 01 No.

**NOTE –**

**a.** All spares in specified quantity as indicated above shall be supplied along with the unit.

**b.** Specific description, Part Nos., Make etc. and Unit Price of each and every item shall clearly be indicated in the bid.

**c.** In case of any difference in spares for left & right wheel studs, axle studs, etc., the specified quantities will be divided into 2(two) equal parts.

**d**. Bidder shall also quote separately for any additional spares with similar details as felt necessary for 2 (two) years trouble free operation and maintenance but not covered in this list for future reference/ procurement- NOT FOR BID EVALUATION.

**11.3 RECOMMENDED SPARES:**

The bidder shall furnish a list of spares & components that will be required for regular operation and maintenance, overhauling etc. throughout the life of the equipment.
The bidder should also provide detailed spare list of all the items including bought out items in the operation and maintenance manuals.
The list should include a spare parts list along with OEM part numbers, make & model of the equipment and contact postal address of OEM for all items of the whole unit.
The bidder has to submit a complete spare parts list for the whole unit sub grouping major component.

11.4 The bidders must submit a written undertaking (along with the bid) that they would be able to supply all the requisite spares and consumables (including bought out items)

for a minimum period of 10 (ten) years from the Certified date of completion / successful field commissioning of the unit.

## 12. Technical Manual and catalogues For Operation And Maintenance Of The Unit:

The following Manuals & Catalogues in per unit **in printed form** shall be supplied along with the unit (**in the English language**) addition to the supply of the same in Compact Disk (CD). **Supply of the manuals/ catalogues only in Compact Disk is not acceptable**. **Manuals/ Part Catalogues provided shall be Custom Illustrated Manuals/Catalogues for the particular vehicle only, not a general Composite Manual/Catalogue.**

**A.** 4(Four) sets of printed Spare Parts Catalogue and Workshop & Service Manual for all components/systems of truck chassis like engine, transmission, axles, brakes, suspension, electrical & pneumatic systems, complete schematics of electrical & pneumatic circuits

**B.** 2 (Two) sets of operator's manual

**C.** 4(Four) sets of Operation and Maintenance Manuals for all the instrumentation items along with test and calibration certificate for each instrument shall be supplied

**D.** The bidder has to supply 4 sets of operating, maintenance and spare parts manual detailing maintenance schedule for daily maintenance, preventive maintenance, major overhauling and frequency of spares replacement for all the components of the unit. The operation and maintenance manual should also contain details of all sub assemblies, instrument sensors, wiring diagram hydraulic schematics with colour code and entire requisite spare parts with part no (Preferably OEM part no. with detail contact address).

**E.** 4 (Four) copies of all relevant test and quality control certificates of the manufacturing and testing of all unit functions and parameters shall be supplied

**F.** Four sets of all relevant test and calibration certificate for each instrument shall be supplied along with the unit.

**G.** The necessary licensed software in original packages along with user software backups are also to be supplied

**COMMISSIONING OF THE UNIT SHALL NOT BE CONSIDERED AS COMPLET UNTIL & UNLESS ALL ABOVE PRINTED MANUALS / CATALOGUES ARE SUPPLIED.**

## 13. INSPECTION CUM ACCEPTANCE

1) Pre-shipment inspection shall be carried out by OIL at manufacturing site. The supplier shall inform OIL at least 1 (one) month ahead for such inspection to enable OIL to send its inspectors. The supplier has to arrange for 2 (two) OIL engineers for inspection. OIL will bear the expenses towards traveling and accommodation etc. of the OIL's inspection team. The Inspection cum Acceptance process would include the following minimum steps/tasks but not limited to -

**a.** Physical verification/inspection of all the items/fittings/accessories including all Parts Catalogue, Maintenance & Service Manuals, Final Chassis Built Up/Vehicle Content Record documents, etc. and **actual loading on axles**. The supplier shall arrange driver/operator, weighing facility and any other infrastructure during the process of inspection as and when required.

**b.** Operational testing of the carrier.

**c.** Supplier shall have to take note of any minor modification/s for operational requirement suggested by the inspector and comply with the same at no extra cost.

**d.** The inspection report would be prepared at the end of the inspection and jointly signed by both the parties.

**e.** Supplier shall confirm in writing compliance of all the points raised in the inspection report as well as any other subsequent additions/changes, following deliberation with the inspector after arrival at Duliajan.

**f.** Supplier will affect despatch of the unit only on receipt of OIL's despatch advice.

**14. TRAINING TO OIL PERSONNEL ON MULTI PURPOSE PUMPING UNIT SYSTEM:**

The supplier shall have to provide training to OIL personnel in two phases –

14.1 During the pre-despatch inspection visit of OIL's engineers, the supplier shall arrange comprehensive training at their manufacturing plant/works for a period of minimum 2 (two) weeks on **Operation & Maintenance, Troubleshooting and Working Principle** of followings system/items used in the unit amongst other relevant subjects:

1. Engine and its Electronic Controller System.
2. Transmission, Transfer Case and their control systems.
3. Brake & ABS - including their electronic control system.
4. Power assisted steering system including hydraulic pump and gearbox.
5. Pneumatic system for brake, transmission, PTO shifters including different valves.
6. Hydraulic system
7. Control panel
8. Maintenance and Operation of Pumping System

14.2 During installation and commissioning of the unit, the commissioning engineer shall have to provide field training as well as class room training for a period of 1(one) week to OIL Engineers and technicians on Maintenance, troubleshooting, Working Principle and repair/ replacement of different equipment.

14.3 Bidders should quote their training charges separately for evaluation purposes. The charges should be shown in Commercial bid only.

**15. COMMISSIONING:**

**16. GUARANTEE / WARRANTY:**

The bidder shall offer a period of at least 1 (one) year warranty for the entire equipment supplied from the date of successful field commissioning of the entire equipment. OIL reserves the right to inspect, test and if necessary reject any part/parts after delivery at site (including incomplete manuals, catalogues, etc.) in case of any fault on the part of the supplier. It shall in no way be waived by the reason that the unit/item was previously inspected and passed by OIL as per Inspection Clause detailed elsewhere in the NIT. To keep the unit fully operational, in case of failure of any item during the warranty period, it shall be the supplier's responsibility to arrange replacement/repairing at site at their cost including customs, freight, etc. within a period of maximum 3(three) weeks from the date of notification of such failure and warranty for such items shall be extended accordingly.

**17. BID SUBMISSION & DOCUMENTATIONS**

Bidder's response to all NIT stipulations should clearly be defined maintaining the same sequence as in the NIT. Bidder shall furnish specific details/specifications of all major components, systems with Make & Model etc. Submission of technical leaflet/catalogue alone is not sufficient.

General Response like- 'As per NIT Specifications/ Technical Leaflet', 'Noted', 'Accepted' or in any similar fashion is not encouraged. Quoting only the NIT stipulation without any confirmation of acceptance of the same and/or without any confirmation of offering the same is also not acceptable.

**17.1 Following documents shall be submitted along with bid for evaluation**

a) Technical leaflets with detailed specifications, Make & Model of chassis, engine, transmission, power take off, transfer case (if any), axle, suspension, steering, brake, etc.

b) Detail dimensional layout drawing/s illustrating Driver's Cabin & position of all major components & their mounting on the vehicle.

c) List of tools that shall be supplied under Standard Tool Kit for general maintenance of the truck.

d) Specific description, Part Nos., Make, etc. & Unit Price of each and every spares (for bid evaluation) as detailed in the **Operational Critical Spares** List provided in para 11.2 above.

e) List of Recommended Spares in para 11.3 above.

f) Checklist as per enclosed format shall be furnished along with the bid.

g) The weight of individual major equipment to be mounted on the truck chassis.

**17.2 Following documents are to be submitted along with supply / unit**

a) Sale Letter, Pollution & Roadworthy Certificate (in similar format of Form 21 & 22A of Indian Motor Vehicle Act - sample copies enclosed), Engine Emission Norms Certificate, etc. as required under Indian Motor Vehicle Act for registration of the unit in the name of **Oil India Limited.**

b) Final Chassis Built Up/Vehicle Content Record documents from chassis manufacturer.

c) Specification Sheet of unit indication all details viz Make & Model of chassis, engine, transmission, etc, GVWR, Axle Capacity, Axle Loading, Wheelbase, etc., number of Axles, wheels & tyres, etc., overall dimensions, turning radius, etc.

d) Certificate of Origin for the chassis in original from chassis manufacturer. Amongst others, the certificate shall contain following information –
   I. Make & Model of Chassis.
   II. Vehicle Identification Number (VIN i.e. Chassis No.)
   III. Month & Year of Manufacture of the chassis.
   IV. Make & Model of Engine.
   V. Serial No. of Engine.
   VI. Month & Year of Manufacture of the engine.

e) Notwithstanding any clause mentioned elsewhere in the NIT, the invoice for the complete unit shall be submitted in 2(two) parts separately as under –

   **i. Invoice for truck chassis** - it shall include the cost of the truck chassis with driver's cabin only.

   **ii. Invoice for pumping equipment -** it shall include cost of all equipment of pumping unit, tools, accessories, etc. subsequently fitted in the original truck chassis as well as supplied separately along of the unit.

**18. DEVIATIONS FROM THE SPECIFICATIONS:**

The bidder shall enclose comprehensive list of intended deviations from the technical specifications, of any clearly highlighting the reasons thereof, along with the bid. If no deviations from the Technical specifications are intended, the same shall be confirmed in the offer. But OIL reserves the right for acceptance or rejection of the deviation.

**C H E C K L I S T**

**Part A TECHNICAL**
**A 1.1 (TRUCK CHASIS)**

| Sl. No. | PARAMETERS / REQUIREMENTS | BIDDER'S OFFER (To indicate details or yes/no, as applicable) | REMARKS, IF ANY |
|---|---|---|---|
| 1 | Make & Model of Chassis | | |
| 2 | Max. Permissible Gross Vehicle Weight | | |

| | | | | |
|---|---|---|---|---|
| | (GVWR) | | | |
| 3 | Drive | | | |
| 4 | Wheelbase | | | |
| 5 | Overall Dimensions (Width, Height & Length) of complete unit | | | |
| 6 | Ground Clearance | | | |
| 7 | Laden Weight (Total weight of the unit) | | | |
| 8 | Engine | a Make & Model | | |
| | | b Max. Output Power | | |
| | | c Max. Output Torque | | |
| | | d Naturally Aspirated or Turbo Charged | | |
| | | e Emission Norms | | |
| | | f Control System (Electronic?) | | |
| 9 | Transmission (Main) | a Make & Model | | |
| | | b No. of gears | | |
| | | c High/Low provision | | |
| 10 | Make, Model & Type of Transmission Shifter | | | |
| 11 | Make & Model of Transfer Case, if any | | | |
| 12 | Total number of PTOs in operation | | | |
| 13 | Make & Model of PTOs | | | |
| 14 | Make, Model & Type of Steering System | | | |
| 15 | Minimum Turning Radius | | | |
| 16 | Make, Model & Type of Front Suspension | | | |
| 17 | Make, Model & Type of Rear Suspension | | | |
| 18 | Axle Capacity | a Front | | |
| | | b Rear | | |
| 19 | Axle Loading (actual loading) | a Front | | |
| | | b Rear | | |
| 20 | Axle Loading within 85% of capacity. | | | |
| 21 | Type, Size of Wheel & Tyre | a Front | | |
| | | b Rear | | |
| 22 | Type of Service Brake (S-cam or not) | | | |
| 23 | Type of Wheel Brake Servos(screw type manual release or not) | a Front | | |
| | | b Rear | | |
| 24 | Fuel Tank capacity | | | |
| 25 | Number of fuel tank | | | |
| 26 | Seating Capacity inside Driver's cabin. | | | |
| 27 | Reversing Alarm with Blinker Lights | | | |
| 28 | Electrical fittings/equipment suitable for oilfield area. | | | |
| 29 | Speedometer/Odometer in Metric (KM) calibration. | | | |

| | | | |
|---|---|---|---|
| 30 | Provision of Air Dryer in truck's pneumatic system. | | |
| 31 | Towing Hooks at Front & Rear of truck. | | |

**Part B DOCUMENTATIONS**
**B1.1 TRUCK**

| Sl. No. | DESCRIPTIONS | DOCUMENT ENCLOSED (Yes or No) | REMARKS, IF ANY |
|---|---|---|---|
| 1 | Technical leaflets with detailed specifications, Make & Model of chassis, engine, transmission, transfer case (if any), PTOs, suspension, axle, steering, wheel & rim, brake, etc. | | |
| 2 | Detailed dimensional layout drawing illustrating Driver's Cabin and all major items/ components. | | |
| 3 | List of items that shall be supplied under Engine Fault Diagnostic & Repair Tool (both Software as well as complete Hardware). | | |
| 4 | List of items that shall be supplied under ABS Fault Diagnostic & Repair Tool (both Software as well as complete Hardware). | | |
| 5 | List of tools that shall be supplied under Standard Tool Kit for general maintenance of the truck. | | |
| 7 | Specific description, Part Nos., Make, etc. and Unit Price of each and every spares as detailed in the Automobile Spare Parts List. | | |
| 8 | List of additional spares as felt necessary for 2 years maintenance but not covered in the Automobile Spare Parts List provided in the NIT with Description, Part Nos., Make, etc. including Unit Rate (for future reference/procurement only; not for bid evaluation). | | |

*- This is a sample copy **similar to FORM 21 of Indian Motor Vehicle Act** only. The certificate to be issued by supplier shall contain following minimum information. -*

---

**SALE CERTIFICATE**

Certified that …….. (brand name of the vehicle) has been delivered by us to …… on …… (date).
Name of the buyer ……..
Address ……..

The details of the vehicles are as under -:

1. Class of vehicle ……..
2. Maker's name & address ……..
3. Chassis No. ……..
4. Engine No. ……..
5. Horse power or cubic capacity……..
6. Fuel used ……..
7. Number of cylinders ……..
8. Month and year of manufacturing ……..
9. Seating capacity (including driver) ……..
10. Unladen weight ……..
11. Maximum axle weight, number and description of tyres –
(a) Front axle ……..
(b) Rear axle/axles ……..
(c) Any other axle ……..
12. Colour (s) of the body ……..
13. Gross vehicle weight ……..
14. Type of body ……..

**Date: ……..** **Signature of the manufacturer / dealer**

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*- This is a sample copy s**imilar to FORM 22(A) of Indian Motor Vehicle Act** only. The certificate to be issued by supplier shall contain following minimum information. -*

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**CERTIFICATE OF COMPLIANCE WITH POLLUTION STANDARDS / SAFETY STANDARDS OF COMPONENTS AND ROAD WORTHINESS**

Certified that …… (brand name of the vehicle) bearing Chassis number …… and Engine number …… complies with the …….. (name of Emission Standard – Euro III, etc.) Emission standard as well as other Safety & Road Worthiness Standards as per provisions of the …….. (name of Motor Vehicles Act of country of origin).

It is also certified that body of the above vehicle has been fabricated by us and the same complies with the provisions of the …….. (name of Motor Vehicles Act of country of origin).

Signatures of Manufacturer / Body Builder

**Annexure-I**

**SPECIFICATION FOR "FOAM TENDER" WITH CHASSIS, FABRICATION & ACCESSORIES**

**Part – B "Fabrication of Foam Tender & ACCESSORIES"**

## 1.0 SCOPE :

1.1 This specification covers the requirements regarding design, procurement, fabrication, testing and supply of "Foam Tender" to be used for fire fighting. The scope of supply shall be inclusive of, but not limited to the following.

1.1.1 A centrifugal type fire water pump of 8000 LPM discharge capacity at 10Kg/cm2.
1.1.2 A foam compound gear/transfer pump of 500LPM discharge capacity at 14kg/cm2.
1.1.3 Power take-off units for driving the water pump & foam pump.
1.1.4 Foam compound tank of capacity 3000 Litres capacity.
1.1.5 Water tank of capacity 6000 Litres capacity.
1.1.6 Balance pressure foam-proportioning system.
1.1.7 Around the pump foam proportioning system
1.1.8 Remote controlled non-aspirating jet cum spray type water cum foam monitor (Variable flow 350 GPM to Min. 1000 GPM Aqua foam / Fog type)
1.1.9 Hose Reel.
1.1.10 Body Fabrication/ Works
1.1.11 Control Panel
1.1.12 Accessories and spares
1.1.13 Piping, necessary controls etc. Complete

1.2 The chassis with cabin for the "Foam Tender" shall be procured & supplied by the vendor. The vendor shall be responsible for supplying all equipment / accessories and properly fixing them on the chassis as described in this specification. Other details and requirements which are not covered under this specification, but may be necessary to complete the "Foam Tender" and/or to fulfil the operation/performance requirement shall be provided by the vendor, who will be responsible for the design and construction of the complete appliance to the full satisfaction of the owner.

## 2.0 General Requirements

2.1 The **"Foam Tender"** including all accessories shall be designed, manufactured, tested etc. as per relevant Indian, International Standards, wherever applicable and as per sound engineering practice.

2.2 All the equipment and accessories shall be fixed on the appliance in a compact and neat manner and shall be so placed that each part is easily and readily accessible for use and maintenance. The centre of gravity shall be kept as low as possible.

2.3 The controls on control panel shall be so arranged that one man can operate all the controls.

2.4 The stability of the whole vehicle shall be such that under equipped condition if the surface on which the appliance stands is tilted to either side to an angle of 27º from the horizontal, the point at which the overturning occurs is not passed.

2.5 The vendor shall provide a detailed description of the "**Foam Tender**", a list of equipment to be furnished, and other construction and performance details to which the "Foam Tender" shall conform.

2.6 The detailed description of the **"Foam Tender"** shall include, but shall not be limited to, estimated weight, wheelbase, turning clearance radius, principal dimensions, transmission, and axle ratios.

2.7 Responsibility for the "Foam Tender" and equipment shall remain with the vendor until they are accepted by the OIL.

2.8 On initial delivery of the "Foam Tender", the vendor shall supply a qualified representative to demonstrate the "Foam Tender" and provide initial instruction to representatives of the purchaser regarding the operation, care, and maintenance of the "Foam Tender" and equipment supplied.

2.9 **INSPECTION & TESTING :**

2.9.1 Third-Party Certification of Test Results:-The results of tests to be certified by an independent third-party certification organization.

2.9.2 Prior to dispatch of vehicle from vendor's shop, stage-wise & final inspection & testing shall be carried out by the vendor to the complete satisfaction of third party inspection agency without any extra cost to Oil India Ltd as mentioned below :-

| | |
|---|---|
| **First stage** | Construction of under- structure, Water and foam tank. Documents related to Quality of material of tanks and thickness of tank's plates, radiography inspected and stamped by recognised third party inspector shall be produced at the time of 1st stage inspection. |
| **Second stage** | Placement of all tanks, fittings, lockers, pump, quality of fabrication, checking of anti-corrosion treatment / painting, electrical fittings. |
| **Third stage** | Performance test of all the systems, pump, primer, PTO, load & stability test of fire tender, testing of equipments / tools & appliances, checking of all relevant documents etc. |

2.9.3 **Stability:** Stability of appliance will be such that when fully equipped & laden, if the surface on which the appliance stands is titled to either side at an angle of 27º from horizontal it will not overturn.

2.9.4 **Gradient:** The vehicle will be tested on a gradient test ramp at an angle of 1:4. as per BIS.

2.9.5 **Endurance Test:** The pump will be tested for a continuous period of four hours & water will not be replenished during this test, engine will not show signs of overheating.

2.9.6 **Priming Test:** The priming will be tested as per the latest standards & the system will be subjected to a test at a suction of vertical lift of 7 Mtrs measured

from water level to the centre of suction eye of the pump at a rate of not less than 23-24 seconds.

2.9.7 **Articulation Test:** The vehicles shall be tested for articulation & will not show any signs of stress during this test. The clearance in the wheel wells will be checked for tolerances.

2.9.8 **Hydraulic Testing**: All the piping will be subjected to hydraulic test pressure of 18 Kg/cm2 for a period of 2 hrs. The pump casing will be subjected to a hydraulic test pressure of a minimum 21 Kg/cm2.

2.9.9 **Shower Test:** After completion of the fabrication, the vehicle will be subjected to shower test as per the norms laid down under BIS. The appliance will not show any signs of leakages during this test.

2.9.10 **Road Test:** Vehicle will be tested for braking, acceleration & top speed by the inspecting officers.

2.9.11 All consumable (e.g. foam compound, diesel fuel, engine lube oil, water etc.) shall be arranged by vendor at his own cost. Vendor shall arrange all facilities to carry out inspection & testing.

2.9.12 Oil India Ltd. representatives shall have access at all reasonable times to vendor's works where the appliance or its accessories are being fabricated and tested.

2.9.13 Drawings & Quality assurance Plan (QAP) shall be approved by the Oil India Ltd. No supply shall be accepted unless drawings & Quality assurance Plan (QAP) are finally approved by the Oil India Ltd. with no additional comments.

2.9.14 Third party Inspection agency shall carryout the Inspection based on approved drawings & approved QAP.

2.9.15 The inspection release note of Third part Inspection agency shall clearly stipulate that

Material /equipment have been inspected as per approved drawings & approved QAP.

2.9.16 Final tests/Inspection for completed vehicle shall be witnessed by Oil India Ltd. representatives along with third party inspection agency.

2.9.17 **FOR WATER AND FOAM TANKS :**

2.9.17.1 Review of mill test certificates and Co-relation of raw materials before start of fabrication.

2.9.17.2 DP test of all welds of water and foam tanks.

2.9.17.3 DP test of all nozzles to shell (reinforcement pads) for water and foam tanks.

2.9.17.4 Visual and dimensional check of water and foam tanks before mounting on chassis.

2.9.17.5 Hydraulic test of completed water and foam tanks. Hydraulic test shall be carried out at 0.5 KG/CM2 (G) at top of tanks. Pressure shall be held for the duration to permit complete inspection.

2.9.18 **FOR PIPING :**

2.9.18.1 Review of mill test certificates and co-relation of raw materials (for pipes, fittings, valves etc) before start of fabrication.

2.9.18.2 DP test of butt welds and final run.
2.9.18.3 DP test of all flanges to pipe welds.
2.9.18.4 Radiographic examination of 10% butt welds (selected at random).
2.9.18.5 Hydraulic test of piping installation on chassis.
2.9.18.6 Visual and dimensional check.

2.9.19 **FOR WATER PUMP :**

2.9.19.1 Review of mill test certificates for material of casing, impeller and shaft.
2.9.19.2 Hydraulic testing of casing.
2.9.19.3 Performance testing of pump to establish the performance curve at rated speed and power absorbed at rated conditions. Parameters at maximum & minimum allowable speeds shall be evaluated to establish performance curves at these speeds.

2.9.20 **POWER INPUT AT RATED CONDITIONS :**

2.9.20.1 Four-hour mechanical run test shall also be carried out.
2.9.20.2 Performance test shall be done on test bench with shop driver.
2.9.20.3 Four hour run test at rated conditions for verifying performance.
2.9.20.4 NPSH test.
2.9.20.5 Visual and dimensional check.
2.9.20.6 Performance test of auto water ring primer at rated conditions.

**NOTE:** The above inspections & tests shall be carried out at pump manufacturer's shop prior to dispatch. Third party inspection agency shall review the documents for the tests carried out by the manufacturer.

2.9.21 **FOR FOAM PUMP :**

2.9.21.1 Review of mill certificates for material of casing, gears and shaft.
2.9.21.2 Dynamic testing of casing.
2.9.21.3 Performance testing of pump to establish the performance curve and power absorbed at rated conditions. Parameters at maximum & minimum allowable speeds shall also be evaluated.
2.9.21.4 Power input at rated conditions
2.9.21.5 Four-hour mechanical run test shall be carried out.
2.9.21.6 Performance test shall be done on test bench with shop driver.
2.9.21.7 Four-hour run test at rated conditions for verifying satisfactory performance.
2.9.21.8 NPSH test.
2.9.21.9 Dismantle inspection of close running parts after performance test.
2.9.21.10 Visual and dimensional check.

**NOTE:** The above inspections & tests shall be carried out at pump manufacturer's shop prior to dispatch. Third party inspection agency shall review the documents for the tests carried out by the manufacturer.

2.9.22 **FOR PTO UNITS :**

2.9.22.1 All standard tests as specified by the PTO supplier.

2.9.23 **FOR AUXILLIARY HEAT EXCHANGER (FOR MAIN ENGINE) (Required if heat exchanger provided) :**

2.9.23.1 Hydraulic test of shell & tube sides with dimensional and visual check.

2.9.24 **FOR FOAM / WATER MONITOR :**

2.9.24.1 Availability of the specified flow and pressure of water and foam solution at the base flange for the monitor.
2.9.24.2 Review of mill certificates for material.
2.9.24.3 Hydro-testing of monitor
2.9.24.4 Horizontal & vertical movements of monitor along with remote operation.
2.9.24.5 Spray/jet pattern of the monitor along with its remote operation.
2.9.24.6 Measurement of Foam Induction ratio (3%).
2.9.24.7 Foam expansion ratio of monitor.
2.9.24.8 Water & foam throws.
2.9.24.9 Workmanship & painting.
2.9.24.10 Wiring & remote operation panels.

2.9.25 **FOR "FOAM TENDER" (DURING FABRICATION AND ASSEMBLY) :**

2.9.25.1 Review of mill test certificates and co-relation of raw materials used for structure & body fabrication before start of fabrication.
2.9.25.2 Inspection of framework (for cabin and body) for soundness of welding and fitment of chassis and dimensional check.
2.9.25.3 Inspection for proper installation of pumps, tanks, piping with supports and their dimensional checks.
2.9.25.4 Visual inspection of raw materials for framework, cladding, flooring etc.

2.9.26 **FOR COMPLETED VEHICLE :**

2.9.26.1 Determination of actual payload on the chassis so as to confirm payload given by vendor in the bid. For determining actual payload all tanks shall be full, all removable accessories will be on vehicle with a crew of six.
2.9.26.2 Static stability of the fully laden vehicle shall be checked to ensure that no overturning occurs till vehicle attains tilting of 35 + 1 degrees from horizontal.
2.9.26.3 Road test of the fully laden vehicle shall be carried out to ensure the maximum speed, acceleration, turning radius, breaking ability as specified by chassis manufacture.
2.9.26.4 Dimensional check of completed vehicle. The overall height shall be measured both when vehicle is laden with full payload and un-laden.

2.9.26.5 Test to confirm functional capability of the "Foam Tender" shall be carried out:

2.9.26.5.1 Running of water pump at rated conditions while discharging water through various outlets individually and in combination.

2.9.26.5.2 The pump shall be run for minimum 4 hours continuously at rated conditions.

2.9.26.5.3 Functional testing of each water outlet (hose point / hose reel) individually and in combination.

2.9.26.5.4 Performance tests of foam-cum water monitor.

2.9.26.5.5 Performance tests of foam-cum-water monitor with water through hydrant inlets.

2.9.26.5.6 Running of foam pump at rated conditions (with water pump also running at rated conditions) while delivering foam compound to the connected outlets for discharging foam / water mixture to the outlet.

2.9.26.5.7 Functional testing of each proportionate device individually and in combination when delivering foam compound to the connected outlets for discharging foam / water mixture to the outlet.

2.9.26.5.8 Functional testing of each hose outlet individually and in combination.

2.9.26.5.9 Functional testing of all foam making equipment.

2.9.26.5.10 Vibrations at rotary parts

## 2.10 **Personnel Protection :**

2.10.1 Electrical insulation or isolation shall be provided where necessary in order to prevent electrical shock from onboard electrical systems.

2.10.2 Vehicular workmanship shall ensure an operating environment free of accessible sharp projections and edges.

2.10.3 Safety-related (caution, warning, danger) signs shall meet the requirements of job.

## 2.11 **Controls and Instructions :**

2.11.1 Illumination shall be provided for controls, switches, instruction plates, gauges, and instruments necessary for the operation of the "Foam Tender" and the equipment provided on it.

2.11.2 All required signs, plates, and labels shall be permanent in nature and securely attached

2.11.3 The signs, plates, and labels shall have resistance to damage from temperatures between –35°C and 80°C and exposure to oil, fuel, water, hydraulic fluids, or other fluids used on the "Foam Tender".

2.11.4 No gauge or visual display shall be more than 84 in. (2.1 m) above the level where the operator stands to read the instrument.

2.11.5 The central midpoint or centerline of any control shall be not more than 72 in. (1800 mm) vertically above the ground or platform that is designed to serve as the operator's standing position.

2.12 **Component Protection :**

2.12.1 Hydraulic hose lines, air system tubing, control cords, and electrical harnesses shall be mechanically attached to the frame or body structure of the "Foam Tender".

2.12.2 The type of equipment described shall be furnished with protective looms, grommets, or other devices at each point where they pass through body panels or structural members or wherever they lie against a sharp metal edge.

2.12.3 A through-the-frame connector shall be permitted to be used in place of metal protective looms or grommets.

2.13 **Vehicle Stability :**

2.13.1 When the "Foam Tender" is loaded to its maximum in-service weight, the height of the vehicle's center of gravity shall not exceed the chassis manufacturer's maximum limit.

2.14 **Weight Distribution :**

2.14.1 When the "Foam Tender" is loaded to its maximum in-service weight, the front-to-rear weight distribution of the "Foam Tender" as defined shall be within the limits set by the chassis manufacturer.

2.14.2 The front axle loads shall not be less than the minimum axle loads specified by the chassis manufacturer under full load and all other loading conditions.

2.15 **Load Distribution :**

2.15.1 Using the information supplied by the purchaser, the "Foam Tender" manufacturer shall calculate the load distribution for the "Foam Tender".

2.15.2 The manufacturer shall engineer the "Foam Tender" to comply with the gross axle weight ratings (GAWR), the overall gross vehicle weight rating (GVWR), and the chassis manufacturer's load balance guidelines.

2.15.3 The Foam Tender, as supplied by the manufacturer, shall have a side-to-side tire load variation of no more than 7 percent of the total tire load for that axle or the limits allowed by the axle or component manufacturer.

2.16 **Tender Performance :**

2.16.1 The Tender shall meet all the requirements while stationary on a grade of 6 percent in any direction.

2.17 **Roadability :**

2.17.1 The Tender, when fully equipped and loaded, shall be capable of the following performance while on dry, paved roads that are in good condition:

2.17.1.1 The Tender shall be able to attain a minimum top speed of 80 kmph on a level road.

2.18 **Serviceability :**

2.18.1 Where special tools are required for routine service on any component of the Tender, such tools shall be provided with the Tender.

2.19 **Road Tests :**

2.19.1 Road tests shall be conducted in accordance with this section to verify that the completed Tender is capable of compliance roadability.

## 2.20 INFORMATION / DOCUMENTS REQUIRED FROM VENDOR :

2.20.1 Any documentation provided with the Tender shall be permitted to be in printed format, electronic format, audiovisual format or a combination thereof.

2.20.2 All drawings & literature shall be kept in Proper folders.

2.20.3 All literature shall be on A-4 size paper and shall be properly laminated.

2.20.4 Each drawing shall be kept in separate pockets in folder. Contents in each pocket shall be labelled properly.

### 2.20.4.1 AFTER PLACEMENT OF ORDER :

The following documents are required to be submitted in 4 sets and to be approved prior to start of fabrication **:**

2.20.4.1.1 Flow diagram showing all piping tanks, pumps, valves etc.

2.20.4.1.2 GA & cross sectional drawings, characteristic curves and other details for water and foam pump.

2.20.4.1.3 Internal Drawings for PTO Units and other technical details.

2.20.4.1.4 Drawings for both PTO systems to drive pumps from engine.

2.20.4.1.5 Detailed Drawing for foam-cum water monitor.

2.20.4.1.6 Fabrication drawings & data for water and foam tanks.

2.20.4.1.7 Drawings & data for balance pressure foam proportionate system.

2.20.4.1.8 Drawings & data for auxiliary foam induction devices.

2.20.4.1.9 Line diagram for electrical circuits.

2.20.4.1.10 Drawings showing layout of all equipment, lockers, cabin etc.

2.20.4.1.11 QAP incorporating the stipulated inspection and testing requirements.

### 2.20.4.2 AFTER COMPLETION OF ORDER (6 SETS) :

The manufacturer's record of Tender construction details, including the following

Information :

2.20.4.2.1 Owner's name and address (Oil India Ltd., Duliajan, Dibrugarh , Assam.)

2.20.4.2.2 Tender manufacturer, model, and serial number

2.20.4.2.3 Chassis weight distribution in pounds (kilograms) with water and foam & manufacturer mounted equipment (front and rear)

2.20.4.2.4 Chassis transmission PTO(s) make, model, and gear ratio

2.20.4.2.5 Pump make, model, rated capacity in liters per minute and serial number

2.20.4.2.6 Pump transmission make, model, serial number, and gear ratio

2.20.4.2.7 Foam pump make, model, rated capacity in liters per minute and serial number

2.20.4.2.8 Water tank certified capacity in liters.

2.20.4.2.9 Foam tank certified capacity in liters.

2.20.4.2.10 Paint manufacturer and paint number(s)

2.20.4.2.11 Company name and signature of responsible company representative
2.20.4.2.12 As built drawings of tender
2.20.4.2.13 As built drawings for tanks.
2.20.4.2.14 Flow diagram.
2.20.4.2.15 GA & cross sectional drawings, characteristic curves and other details for water & foam pumps.
2.20.4.2.16 As built Drawings for Installation of PTO Units.
2.20.4.2.17 As built Drawing for foam-cum water monitor.
2.20.4.2.18 As built Drawings & data for auxiliary foam induction device.
2.20.4.2.19 As built Line diagram for electrical circuits.
2.20.4.2.20 All inspection and testing records for tanks, pumps, PTO's, piping, valves, monitor etc.
2.20.4.2.21 Operating and instruction manual for the tender. This should also contain adequate information for all bought out items also.
2.20.4.2.22 Certification of slip resistance of all stepping, standing, and walking surfaces
2.20.4.2.23 Fire pump manufacturer's certification of suction capability
2.20.4.2.24 Fire pump, a copy of the Tender manufacturer's approval for stationary pumping applications.
2.20.4.2.25 Fire pump, the engine manufacturer's certified brake horsepower curve for the engine furnished, showing the maximum governed speed
2.20.4.2.26 Fire pump, the pump manufacturer's certification of the hydrostatic test
2.20.4.2.27 Fire pump, the certification of inspection and test for the fire pump.
2.20.4.2.28 Weight documents from a certified scale showing actual loading on the front axle, rear axle(s), and overall "Foam Tender" (with the water & foam tank full but without personnel, equipment, and hose).

**2.20.4.2.29 Operations and Service Documentation :**

2.20.4.2.29.1 The vendor shall supply operation and service documentation covering the completed Tender as delivered and accepted.
2.20.4.2.29.2 The vendor shall deliver with the Tender all manufacturers' operations and service documents supplied with components and equipment that are installed or supplied by the vendor.
2.20.4.2.29.3 The documentation shall address at least the inspection, service, and operations of the "Foam Tender" and all major components thereof.
2.20.4.2.29.4 The vendor shall also provide documentation of the following items for the entire Tender and each major operating system or major component of the Tender:
A. Manufacturer's name and address
B. Country of manufacture
C. Source for service and technical information

D. Parts replacement information
E. Descriptions, specifications, and ratings of the chassis and pumps
F. Wiring diagrams for low voltage and line voltage systems to include the following information:
   I. Pictorial representations of circuit logic for all electrical components and wiring
   II. Circuit identification
   III. Connector pin identification
   IV. Zone location of electrical components
   V. Safety interlocks
   VI. Alternator-battery power distribution circuits
   VII. Input/output assignment sheets or equivalent circuit logic implemented in multiplexing systems
G. Lubrication charts
H. Instructions regarding the frequency and procedure for recommended maintenance
I. Overall Tender operating instructions
J. Safety considerations
K. Limitations of use
L. Inspection procedures
M. Recommended service procedures
N. Troubleshooting guide
O. Tender body, chassis, and other component manufacturer's warranties
P. Special data if any
Q. Copies of required manufacturer test data or reports, manufacturer certifications, and Independent third-party certifications of test results

## 3.0 Foam Tender's Equipment :

### 3.1 Equipment Storage :

3.1.1 A minimum of 20 ft3 (0.6 m3) of enclosed weather-resistant compartmentation meeting the requirements for the storage of equipment.

### 3.2 Hose Storage :

3.2.1 A minimum hose storage area of 6 ft3 (0.2 m3) for 2½ in. (65 mm) or larger fire hose that meets the requirements.

### 3.3 Minor Equipment :

3.3.1 Brackets or compartments shall be furnished so as to organize and mount the specified equipment.

3.3.2 **Following equipments shall be supplied :**

3.3.2.1 One 6 lb (2.7 kg) flathead or pick head axe mounted in a bracket fastened to the Tender

3.3.2.2 One 6 ft (2 m) or longer pike pole or plaster hook mounted in a bracket fastened to the Tender Two portable hand lights mounted in brackets fastened to the Tender

3.3.2.3 One first aid kit

3.3.2.4 Two Nos. HDPE Long Spine Boards Stretcher.

3.3.2.5 Two combination spanner wrenches mounted in a bracket fastened to the Tender

3.3.2.6 Two hydrant wrench mounted in a bracket fastened to the Tender

3.3.2.7 Double female adapter, sized to fit 2½ in. (65 mm), mounted in a bracket fastened to the tender conforming to IS-901/1993- 4 Nos. (In locker)

3.3.2.8 Double male adapter, sized to fit 2½ in. (65 mm), mounted in a bracket fastened to the tender conforming to IS-901/1993- 4 Nos. (In locker)

3.3.2.9 Eight Nos. wheel chocks with chain link, mounted in readily accessible locations, each designed to hold the Tender.

3.3.2.10 Two Nos. rubber mallets in a bracket fastened to the Tender.

3.3.2.11 A 24 volts DC operated GRAND make blinker light bar (minimum three blinkers on each side) with PA system and siren shall be provided on top of the vehicle with firm support and assembly shall be covered with SS grill. Assembly shall be operable from cabin- 1 No. (fitted on roof, operable from cabin)

3.3.2.12 Fog lamps powered by the battery of the appliance- 2 Nos. (Fitted on front of tender. Switch in cabin).

3.3.2.13 Reversing lights-4 Nos. (At rear of chassis)

3.3.2.14 Strong Reversing siren connected with reverse gear of the vehicle-1 set (Mounted on roof)

3.3.2.15 Search light with 100M length of cable with tripod etc. completes powered from main batteries - 1 set (mounted on roof)

3.3.2.16 Adjustable spot light-2 Nos(Cabin roof)

3.3.2.17 Dragger make SCBA set -2 Sets

Two stage self contained automatic positive pressure compressed air breathing apparatus set with spare cylinder comprising of:

-Antistatic back plate made from high strength Carbon fiber composite material having a high degree of heat, chemical and impact resistance.

-Soft & comfortable harness which will allow easy fitting and removal.

-Cylinders having 1800 liter water capacity, 300 Bar pressure conforming to the requirements specified in the gas cylinder rule 1981 (issued by Govt. of India).

-A cylinder strap of suitable material accommodating all types and sizes of cylinders and having Cam-lock arrangement.

- Special long lasting rubber (EPDM - Ethylene Propolyne Dyne Monomer) make Light weight, ISI Approved 14166:1994 full face wide vision mask, Inner ori-nasal face mask to prevent misting of visor, replaceable visor, speech transmitter, with a compact quick fit first breath actuated demand valve.

-A pressure gauge with a luminous dial should be calibrated in bars.

-The warning whistle should be set on 50 bar.
-The B.A. set should have duration of 45 minutes.
-It should be conformed to IS:10245 (Part II)-1994/Latest and to be embossed on the body of BA Set.
Each B.A. Set should be supplied in a good quality case which will have facility to lock it and carry by single personnel.
Notes:
1) Cylinder & its valve should have CCE/PESO, Nagpur approval and should be sent along with the quotation.
2) The complete set will be approved by DGMS, Dhanbad and certificate to this effect should be sent along with the quotation.
3) Complete mask should be approved as per IS-14166 :1994/Latest and certificate to this effect should be sent along with the quotation.
4) Commissioning & training of the B.A. set will be done at Fire Service Duliajan by the supplier's representative.
5) A container of good quality for keeping B.A. Set should be supplied along with the set.

3.3.2.18 All tools required for normal / routine maintenance of the appliance, which are not included with the kit of chassis -3 Sets (In tool box under rear seat in cabin).

Description of Ordinary Hand Tools in each tool box

| **Sr No** | **Description of Material** | **Quantity of Tools** |
|---|---|---|
| 1. | Set of pipe wrench of sizes: -<br>8",10",12",14",18",24",36". | 01 each |
| 2. | Double open end spanner (set of 6 mm to 32 mm)<br>6x7,8x9, 10x11, 12x13, 14x15, 16x17, 18x19, 20x22, 21x23, 22x24, 24x26, 24x27, 25x28, 30x32 | 01 Set |
| 3. | Ring spanner set (06 mm to 32 mm)<br>6x7, 8x9, 10x11, 12x13, 14x15, 16x17, 18x19, 20x22, 21x23, 24x26, 24x27, 25x28, 30x32 (Total 13 Nos.) | 01 Set |
| 4. | Adjustable slide wrench (04 Nos.)<br>(150 mm, 200, 250 mm & 300 mm) | 01 each |
| 5. | Allen keys (in L' shape) & (size in MM)<br>1.5, 2, 2.5, 3, 04, 05, 06, 07, 08, 09, 10 & 12 (12 Nos.) | 01 each |
| 6. | Combination pliers (02 nos.) 150 mm & 200 mm | 01 each |
| 7. | Flat file (02 Nos.) 150 mm & 200 mm | 01 each |
| 8. | Half round file (200 mm) | 01 No. |
| 9. | Hack saw frame with handle (for 12" long blade) along with 10 Nos. of blades. | 01 Set |
| 10. | Screw drivers (in mm) 04 Nos.<br>50x3, 100x4, 125x6, 150x8. | 01 each |
| 11. | Oil can 1/2 pint capacity | 01 No. |
| 12. | Steel measuring tape (05 meter long) | 01 No. |
| 13. | Nose plier 150 mm | 01 No. |

| | | |
|---|---|---|
| 14. | Bolt Cutter-12 Inch & 24 Inch with Spare Blades Set for Bolt Cutters (Taparia Make) | 02 No. Each |
| 15. | Tin Cutter of good quality | 02 Nos. |
| 16. | Tool box, to contain all above mentioned tools in proper condition. It should be drawer type with 03 pull out drawers and a tote tray with locking system. | 01 No. |
| 17. | Centre Punch | 01 No. |
| 18 | Threading Tools, 20 Pcs Taps And Die Set | 01 Set |

3.3.2.19 PESO/CCE approved removable spark arrestor (If chassis manufacturer not provided) fitted to the exhaust of the engine - 1 No.

3.3.2.20 A trickle charger 250V AC supply for self charging of battery along with a red pilot light to indicate the battery being charged. It shall be fitted in the driver's cabin. AC Main sockets at rear. AC Main sockets to be fitted at the rear of the vehicle-1 No.

3.3.2.21 Stainless Steel dividing breeching each having two 63MM female instantaneous type outlets, conforming to IS-905/1980- 2 Nos. (In Locker)

3.3.2.22 Stainless Steel collecting breeching each having two 63MM male instantaneous type outlets, conforming to IS-905/1980- 2 Nos. (In Locker)

3.3.2.23 Stainless Steel 3 way suction collecting head (With one 140MM outlet with round female threads and two female instantaneous type inlets), conforming to IS-904/1983-2 Nos. (In Locker).

3.3.2.24 STAR Heavy Duty Lazy Type Hand Riveter kit with 1000 Aluminium POP Riveters (Size - 3/16 x 3/4").

**3.3.2.25** Non Sparking Tools – 1 Set **(Tools shall be of Mekaster / Snapon / Hindustan Everest / Hebei Boton make only )**

**Non sparking tools (Beryllium free Aluminum Bronze alloy) :**

Brass Hammer, size: 02kg = 01 No.
Double open end Spanners (Size: 19x22, 24x27, 26x27, 30x32) = 01No. Each.
Hack –saw blade (OAL – 300mm) = 05Nos.
Hack – saw Frame (OAL- 540mm) = 01No.
Knives - 01No.
Chisels - 01No.
Bars Shears - 01No.
Pliers - 01No.
Screwdrivers - 01No.

3.3.2.26 Wolflite Handlamp (H-251Mk1) along with same Make charger Usable in Inflammable gases and Vap.), Approved by PESO wolf make, U.K. High Intensity Intrinsically Safe Search Lights For Hazardous Area – Rechargeable Type : 2 Nos.

Each searchlight set shall consist of battery pack, suitable charger, two spare lamps and one spare front lens.

3.3.2.27 Simplex Make 10.5 Meter Trussed Type Double Extension Ladder. Extension ladder to be provided on the roof of the appliance with gallows on the right side. Ladder shall confirm to IS: 4571. -1 No.

3.3.2.28 Lightweight PVC rubber suction hose fitted with round thread male-female gun metal couplings. Length - 2 meter, Diameter: as per pump suction.-6 Nos. (In compartment on top deck, Compartment shall be open able from top with latching system)

3.3.2.29 Suction strainer with foot valve size to suit suction hose as per IS: 907-1984- 2 Nos. (In locker)

3.3.2.30 Stainless steel foot strainer-2 Nos (In locker)

3.3.2.31 Suction Wrench to tighten suction hose as per Is;4643- 10 Nos. (In locker)

3.3.2.32 Hose bandage rubberized as per IS: IS: 5612(Part-2:1977) -2007 (or Latest) -10 Nos. (In locker)

3.3.2.33 Hose clamps as per IS:5612(Part-1-1977) - 4 Nos. (In locker)

3.3.2.34 Foam branch FB-10X fitted with 63 mm SS male coupling at the base (capacity 100 GPM), conforming to IS-2097-1983– 6 Nos (in locker)

3.3.2.35 TFT make hand controlled non-aspirating aqua fog / foam type nozzles having spray/jet pattern with variable flow & low pressure features (suitable for both foam & water)– 5 Nos. (in locker)

3.3.2.36 Low pressure diffuser branch, conforming to IS-903/1993- 4 Nos. (In locker)

3.3.2.37 Branch pipe with revolving head 63mm, conforming to IS-903/1993-4 Nos. (In locker)

3.3.2.38 Medium size imported Fire Entry Suit-1 Set ( In Suitable Carrying Case)

**SPECIFICATIONS FIRE ENTRY SUIT:**

3.3.2.38.1 The suit should be suitable for total LPG fire entry with temperatures up to 1650 degree centigrade in the presence of a water / fog / sprayer system up-to a maximum duration of one minute and for long duration where the fire is less intense. All components of the complete suit comprises of hood with tempered glass and gold plated lenses, coat with accommodation for breathing apparatus, pants with sewn on suspenders, boots with wire reinforced sole and mitts. The fire entry suit should have outer layer of aluminized fabric which provides protection from radiant temperatures up to $1650^0$ C in the presence of water/fog/sprayer system.

3.3.2.38.2 CERTIFICATION**:** The fabric used for the suit should have approval of UL 214/NFPA 701/ EN407.

3.3.2.39 Fireman's axe with belt and pouches conforming to IS: 3650-1981- 4 Nos. (In locker)

3.3.2.40 Crow bar (IS: 704-1984)- 1 No. (In locker)

3.3.2.41 Sledge hammer - 1 No. (In locker)

3.3.2.42 Jumbo Water Curtains made of stainless steel-8 Nos. (In locker)

3.3.2.43 Ceiling Fire hook as per IS:927:1981-2007 or latest - 3 No.

3.3.2.44 Rapid intervention, Water Mist cum Compressed air Foam Technology fire fighting system on 10 litre back pack system "Aska Make" approved from highest International Safety Std EN3 for minimum Class A21, B233 fire rating – 2 Nos

3.3.2.45 Pick up tube 5 M long threaded coupling for foam transfer from/ to foam pump.- 2 Nos.(In Locker)

3.3.2.46 Mechanical foam generator 2400 LPM -2 Nos. (In Locker)

3.3.2.47 Suction Adaptor 4"- Stainless Steel- 6 Nos.

## 4.0 Chassis and Vehicle Components :

4.1 The "Foam Tender" shall be fabricated on Volvo make Model: VOLVO FM 400 (6x4 drive)

4.2 Drag hook or eye of adequate strength and design shall be provided at the rear & front of the chassis.

4.3 Welding and drilling on frame work of chassis are not allowed.

4.4 After receipt of chassis at vendor's works and till such time the completed equipment is delivered to the owner, it shall be the vendors' responsibility to protect the chassis from damage, accident, pilferage etc. Any damage/shortfall shall be made good by the vendor at no extra cost to OIL.

4.5 An engine hour-meter shall be provided (If not provided by chassis manufacturer).

4.6 A permanent plate in the driving compartment shall specify the quantity and type of the following fluids used in the vehicle:

(1) Engine oil
(2) Engine coolant
(3) Chassis transmission fluid
(4) Pump transmission lubrication fluid
(5) Pump primer fluid
(6) Drive axle(s) lubrication fluid
(7) Power steering fluid
(8) Cab tilt mechanism fluid
(9) Transfer case fluid
(10) Equipment rack fluid
(11) Air compressor system lubricant
(12) Generator system lubricant
(13) Front tire cold pressure
(14) Rear tire cold pressure

4.7 An angle of approach and an angle of departure of at least 8 degrees shall be maintained at the front and the rear of the vehicle when it is loaded

4.8 POWER TAKE OFF UNITS :

4.8.1 Power take-off (PTO) unit for each pump shall be independent.

4.8.2 The power takes off unit for water pump shall be of WEBSTER U.K make/ HALE Products, USA of suitable model. The PTO shall be able to meet performance requirement of pump.

4.8.3 The foam pump shall be driven by a side PTO Unit. Vendor shall submit a sketch showing the arrangement of PTO Units for taking power from main engine on chassis to water pump and foam pump

4.8.4 Each PTO Units shall be engaged by a separate push button in the driver's cabin as well as rear side of vehicle. Switch provided in the driver's cabin for engaging the PTO shall pneumatically operate the mechanical arrangement for PTO engagement. Necessary supports for PTO unit, propeller shafts, couplings, universal joints etc. for power input to and power output from PTO unit shall have to be provided by vendor.

4.8.5 The drive assembly components (shaft, coupling etc) shall be dynamically balanced and the vibration at any of the rotary parts shall be minimum and in no case shall be more than 10mm/sec. Necessary modifications, to the standard drive system as available on the chassis, shall have to be done by the vendor so as to adopt the PTO Units in the system. Prior concurrences need to be obtained from M/s. VOLVO to carry out modifications on drive system. Pump shall not be opened for dynamic balancing.

4.9 AUXILLIARY HEAT EXCHANGER (FOR MAIN ENGINE) :

4.9.1 An auxiliary heat exchanger shall be provided (**if required**) to maintain the temperature in the engine at or below the engine manufacturer's maximum temperature rating under all conditions for which the apparatus is designed.

4.9.2 The body of the heat exchanger shall be mage of Stainless steel (SS-316). Suitable pressure control valve shall be provided to restrict the pressure & flow of water from water pump as per requirement.

4.9.3 Piping from the water pump to auxiliary heat exchanger shall be seamless carbon steel A106 grade B. Pipe up to 2" dia shall be of Schedule 80 and pipes of more than 2"dia shall be of schedule 40.

4.9.4 All the piping in the cooling system and auxiliary heat exchanger shall be hydraulically tested at minimum 25 Kg./cm2 pressure.

4.10 **FOR OTHER WORK ON CHASSIS :**

4.10.1 The two piece extension ladder shall be mounted on suitable gallows fitted with toilers and designed to facilitate easy and quick removal of the ladder by one man from the rear of the tender.

4.10.2 No part of the bodywork shall reduce ground clearance of vehicle to less than 36cm. & not increase the overall width to more than 2.50M. The highest part of the appliance with the ladder and monitor mounted on it shall not exceed 3.60M from the ground level. The construction of super-structure shall not reduce the angles of approach below 30 degree.

4.10.3 Dunlop/3M make anti-vibration rubber mats shall be provided while mounting the tanks etc. on the chassis.

4.10.4 A reflective stripe(s) shall be affixed to the perimeter of the apparatus. The stripe or combination of stripes shall be a minimum of 4 in. (100 mm) in total width and shall conform to the minimum requirements of ASTM D 4956, Standard Specification for Retro reflective Sheeting for Traffic Control, Type I, Class 1 or Class 3. At least 50 percent of the cab and body length on each side,

at least 50 percent of the width of the rear, and at least 25 percent of the width of the front of the apparatus shall have the reflective material affixed to it.

4.10.5 Arrangement shall be made on Dashboard opposite to the fire officers' seat to fix a Motorola mobile wireless set of 25W capacity. Power supply shall be provided from vehicle battery. The owner shall fit wireless set later.

## 4.11 **Optical Warning Devices :**

4.11.1 Tender shall have a system of optical warning devices

4.11.2 The optical warning system shall consist of an upper and a lower warning level.

4.11.3 The four zones shall be designated A, B, C, and D in a clockwise direction with zone A to the front of the Tender in accordance with Figure 4.8.3.2.

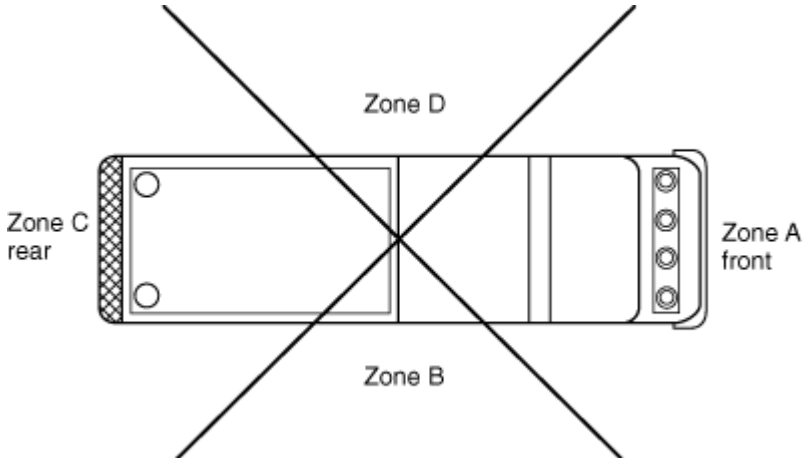


**FIGURE: Warning Zones for Optical Warning Devices**

4.11.4 Each optical warning device shall be installed on the Tender and connected to the Tender's electrical system in accordance with the requirements

4.11.5 A master optical warning device switch that energizes all of the optical warning devices shall be provided in driver's cabin.

4.11.6 The optical warning system on the "Foam Tender" shall be capable of two separate signaling modes during emergency operations.

4.11.7 One mode shall signal to drivers and pedestrians that the Tender is responding to an emergency and is calling for the right-of-way.

4.11.8 One mode shall signal that the Tender is stopped and is blocking the right-of-way.

4.11.9 A switching system shall be provided that senses the position of the parking brake or the park position of an automatic transmission.

4.11.10 When the master optical warning system switch is closed and the parking brake is released or the automatic transmission is not in park, the warning devices signaling the call for the right-of-way shall be energized.

4.11.11 When the master optical warning system switch is closed and the parking brake is on or the automatic transmission is in park, the warning devices signaling the blockage of the right-of-way shall be energized.

4.11.12 The system shall be permitted to have a method of modifying the two signaling modes.

4.11.13 The optical warning devices shall be constructed or arranged so as to avoid the projection of light, either directly or through mirrors, into any driving or crew compartment(s).

4.11.14 The front optical warning devices shall be placed so as to maintain the maximum possible separation from the headlights.

4.11.15 The optical sources on each level shall be of sufficient number and arranged so that failure of a single optical source does not create a measurement point, in any zone on the same level as the failed optical source, without a warning signal at a distance of 100 ft (30 m) from the geometric center of the Tender.

4.11.16 Flash Rate.

4.11.16.1 The minimum flash rate of any optical source shall be 75 flashes per minute, and the minimum number of flashes at any measurement point shall be 150 flashes per minute.

4.11.17 Color of Warning Lights.

4.11.17.1 Permissible colors or combinations of colors in each zone, within the constraints imposed by applicable laws and regulations, shall be as shown in Table.

**Table Zone Colors**

| Color | Calling for Right-of-Way | Blocking Right-of-Way |
|---|---|---|
| Red | Any zone | Any zone |
| Blue | Any zone | Any zone |
| Yellow | Any zone except A | Any zone |
| White | Any zone except C | Not permitted |

4.11.18 **Audible Warning Devices :**

4.11.18.1 Audible warning equipment in the form of at least one automotive traffic horn and one electric or electronic siren shall be provided.

4.11.18.2 The siren manufacturer shall certify the siren as meeting the requirements *Emergency Vehicle Sirens.*

4.11.18.3 A means shall be provided to allow the activation of the siren within convenient reach of the driver.

4.12 **Work Lighting :**

4.12.1 **Ground Lighting :**

4.12.1.1 The work area immediately behind the vehicle shall be illuminated

4.12.1.2 The “Foam Tender” shall be equipped with lighting that is capable of providing illumination on ground areas within 30 in. (800 mm) of the edge of the Tender in areas designed for personnel to climb onto the Tender or descend from the Tender to the ground level.

4.12.1.3 Lighting designed to provide illumination on areas under the driver and crew riding area exits shall be switchable but activated automatically when the exit doors are opened.

4.12.1.4 All other ground area lighting shall be switchable.

4.12.1.5 Surface Lighting. The Tender shall have sufficient lighting on all work surfaces, steps, and walkways.

4.12.1.6 **Interior Lighting** The Tender shall have sufficient lighting to provide in the driving and crew compartments.

4.12.1.7 Compartment Lighting Each engine compartment and pump compartment shall have a light.

4.12.1.8 Each enclosed tool and equipment compartment greater than 4 ft3 (0.1 m3) in volume and having an opening greater than 144 in.2 (0.9 m2) shall have an average minimum level of lighting.

4.12.1.9 Switching. Switches for all work lighting shall be readily accessible.

4.12.1.10 Protection. The lights shall be arranged or protected to minimize accidental breakage.

4.12.1.11 A red flashing or rotating light, located in the driving compartment, shall be illuminated automatically whenever the Tender's parking brake is not fully engaged

**4.12.1.12** The hazard light shall be marked with a sign that reads: **"Do Not Move Tender When Light is On."**

4.12.2 **Backup Alarm (Reverse Horn) :**

4.12.2.1 An electric or electronic backup alarm (Reverse Horn) with light indication shall be provided that meets the Type D (87 dBA) requirements.

4.12.3 Stop, Tail, and Directional Lights.

4.12.4 The Tender shall be equipped with all legally required stop, tail, and directional lights.

4.12.5 Directional lights shall be visible from the front, sides, and rear of the Tender.

4.12.6 Equipment shall not be mounted in a manner that obscures the stop, tail, or directional lights.

## 5.0 Driving and Crew Areas :

### 5.1 General :

5.1.1 Each crew riding position shall be within a fully enclosed personnel area.

5.1.2 A label that states the number of personnel the vehicle is designed to carry shall be located in an area visible to the driver.

5.1.3 Each crew riding position shall be provided with a seat and an approved seat belt designed to accommodate a person with and without heavy clothing.

5.1.4 If available from the chassis manufacturer, the seat belt webbing shall be bright red in color and the buckle portion of the seat belt shall be mounted on a rigid or semi-rigid stalk such that the buckle remains positioned in an accessible location.

5.1.5 Signs that read “Occupants must be seated and belted when Tender is in motion” shall be visible from each seated position.

5.1.6 All interior crew and driving compartment door handles shall be designed and installed to protect against accidental or inadvertent opening. **(Flush type handle locks shall not be used.)**

5.1.7 All driving and crew compartment doors shall have at least 96 in.2 (62,000 mm2) of reflective material affixed to the inside of each door.

5.1.8 Seat Head Height shall be provided.

5.1.9 When independent vertical and/or horizontal seat adjustment is provided, it shall be fully adjustable within 10 seconds.

5.1.10 The seat-to-ceiling height shall be measured at the lowest surface in the area immediately above the projected area of the seat with any soft headliner material depressed by hand.

5.1.11 Seat Arrangement:

5.1.11.1 Each seating space shall have a minimum width of 22 in. (560 mm) at the shoulder level.

5.1.11.2 Seat cushions shall be a minimum of 18 in. (460 mm) in width and 15 in. (380 mm) from the front of the cushion to the face of the seat back.

5.1.11.3 A back cushion that extends from the face of the seat vertically at least 18 in. (460 mm) and that is a minimum of 18 in. (460 mm) wide shall be provided.

5.1.12 The back cushion shall be permitted to be split to accommodate a fully recessed SCBA and bracket.

5.1.13 Where the back cushion is split to accommodate a SCBA, a headrest shall be supplied.

5.1.14 **SCBA Mounting :**

5.1.14.1 Where SCBA units are mounted within a crew compartment, a positive latching mechanical means of holding the SCBA device in its stowed position shall be provided such that the SCBA unit cannot be retained in the mount unless the positive latch is engaged.

5.1.14.2 The bracket holding device and its mounting shall retain the SCBA unit when subjected to a 9 G force and shall be installed in accordance with the bracket manufacturer's requirements.

5.1.14.3 If the SCBA unit is mounted in a seatback, the release mechanism shall be accessible to the user while seated.

5.1.15 **Equipment Mounting :**

5.1.15.1 All equipment required to be used during an emergency response shall be securely fastened.

5.1.16 Prohibiting direct voice communication, a two-way buzzer or two-way voice intercom system shall be provided in drivers & crew cabin.

5.1.17 **Means of Escape :**

5.1.17.1 Any interior area to be occupied by personnel shall have a minimum of two means of escape.

5.1.17.2 Each opening shall be large enough for a person to escape through the opening.

5.1.18 **Instrumentation and Controls :**

5.1.18.1 The following instrumentation and controls shall be mounted in the driving compartment and shall be identified and visible to the driver while seated:

(1) Speedometer
(2) Tachometer
(3) Odometer
(4) Oil pressure indicator or gauge
(5) Coolant temperature indicator or gauge
(6) Automatic transmission temperature indicator or gauge, if applicable
(7) Voltmeter
(8) Hazard indicator light
(9) Air pressure gauge(s), if applicable
(10) Turn signal control and indicator lights
(11) Headlight/DOT light switch
(12) High-beam headlight switch and indicator
(13) Fuel level gauge(s)
(14) Master ignition switch
(15) Warning lights and siren switches
(16) Master electrical load switch
(17) "Battery on" indicator light
(18) Windshield wipers and windshield washer control
(19) PTO-Engaged indicator

5.1.19 Controls and switches that are expected to be operated by the driver while the Tender is in motion shall be within convenient reach for the driver.

5.2 **FIRE CREW CABIN :**

5.2.1 A cabin for 5 persons shall be provided behind the factory built tilt-able driver's cabin. There shall be two doors in the cabin, sized generously with proper arrangement for embarking and disembarking of crewmembers. The doors shall open outwards and hung forward and shall have levers for unlatching from outside and inside. The doors shall be provided with shatterproof safety glasses which can be raised / lowered by winding type mechanism.

5.2.2 First aid box made of fiber glass/ aluminum suitable for 20 persons shall be provided in the cabin. First aid box shall be suitably mounted in the cabin at easily accessible location.

5.2.3 Non slip type steps & grab rails shall be provided in the cabin to assist the crew members to get in & out. Front side of the cabin shall have glass paneling so that the crew can have an all round view.

5.2.4 Provision shall be made in crew cabin to mount two nos. 1600 lit.(300 bar) capacity Self Contained Breathing Apparatus(SCBA) sets in vertical position with the valve down. It shall be supported with brace or yoke under the cylinder or valve. The holding & clamping device shall not injure, wear, scrape or otherwise affect the SCBA units including damage to paint while the cylinder is being placed in or removed from holder.

5.2.5 The crew cabin structure shall be so designed so as to avoid any vibration / rattling / deformation in the intended usage of the vehicle. Cabin shall have one roof light & two side lights (one on each side) for proper illumination of cabin. The entire floor of the crew cabin shall be provided with 3M make vinyl matting of minimum 6MM thickness with anti-skid features.

5.2.6 Battery shall be placed in totally enclosed box with spark proof gland for cable entry with battery cut-Off switch. Installed battery shall have a charging faculty from external source at its location itself.

## 6.0 Body, Compartments, and Equipment Mounting :

### 6.1 STRUCTURE / FRAME WORK :

6.1.1 The structure/frame work on chassis & crew cabin shall be of welded construction and made from 30 mm X 30 mm X1.6 mm hollow square section of SS-316 and distance between each horizontal and vertical square shall be maximum 400 mm. Cross supporting members of the paneling shall be made of SS-316 channels of 75 mm X 5 mm thickness

6.1.2 The entire roof of the vehicle including the crew cabin top, entire rear, crew cabin floor, locker floor and sides shall be made from 2 MM of SS:316 sheets suitably treated for slippage and these shall be bolted to the frame for ease in removal of the tank for repairs. The roof of the cabins should be rigid enough to take the weight of two persons without deforming the roof sheeting.

6.1.3 Area around the monitors operation shall be provided with 16 SWG anodized aluminum-checkered plate (in addition to the 2 mm Alluminum sheets) and shall be bolted to the frame.

6.1.4 Proper access ladder with Grab rails and non-skid steps shall be provided to give access to the roof for approaching the extension ladder, manholes for tanks and monitor etc.

6.1.5 Access handrails shall be provided at each entrance to a driving or crew compartment and at each position where steps or ladders for climbing are located. Access handrails shall be constructed of, or covered with, a slip-resistant, non-corrosive material. Handrails shall be between 1 in. and 1-5/8 in. (25 mm and 41 mm) in diameter and have a minimum clearance between the handrails and any surface of at least 2 in. (51 mm).

6.1.6 All handrails shall be designed and mounted to reduce the possibility of hand slippage and to avoid snagging of hose, equipment, or clothing.

6.1.7 Dual sun- visors and long arm rear view mirrors shall be fitted to drivers' cabin.

6.1.8 Proper draining arrangements shall be provided on the entire roof, crew cabin and inside the lockers.

### 6.2 LOCKERS :

6.2.1 Size and number of locker shall be decided such that on either side 15 nos. 22.5 m length fire hose can be easily accommodated in single layer and equipments may be accommodated in maximum two layers. Sufficient numbers of lockers shall be provided to accommodate all the equipment/accessories in an easily accessible manner.

6.2.2 All lockers shall be provided with Roller type shutter doors. The shutters shall have smooth operation. The aluminum shutters shall be dust & water proof of MCD, France imported make only made of extruded aluminum & duly hard anodized. Roller shutters shall be of hollow rectangular shaped & made from aluminium inter-changeable links connected by means of plastic profiles. Sealing of roller shutter shall be watertight when closed. Roller shutters shall be inward rolling type and shall be provided with guide rails over entire length on both sides to make them torsion free. When shutters are rolled, unobstructed access should be available to the equipment & hoses. Shutters should open in all positions of the vehicle even in rough terrains. Roller shutters shall have locking arrangement to prevent accidental opening during movement of the vehicle.

6.2.3 All the lockers shall be fitted with internal lighting, which shall be capable of being automatically switched, 'ON' and 'OFF' at the time of the opening/closing of shutters. A master switch for isolating the locker lighting circuit shall also be fitted in the driver's cabin.

6.2.4 Lockers shall have arrangement for self draining of any water entering inside

6.2.5 Sufficient number of lockers shall be provided for storage of all accessories listed in clause 13. Lockers shall also be provided to accommodate 6 nos., 10 kg DCP extinguishers, 2 BA Sets & 2 Fire Proximity Suits.

6.2.6 Lockers shall be accessible from ground level by a man of average height (1.67M). All the Lockers shall be provided with 3M make, 4MM thick, vulcanized synthetic rubber mat at bottom and up-to 12 inch on three sides.

6.2.7 The hose storage area(s) shall be reinforced at the corners.

6.2.8 The bottom shall be made of removable sections fabricated from noncorrosive materials.

6.2.9 The bottom shall be constructed to prevent the accumulation of water and allow ventilation to aid in drying of hose.

6.2.10 The interior shall be smooth and free from all projections, such as nuts, sharp angles, or brackets that might cause damage to the hose.

6.2.11 Reels, handrails, ladders, and equipment holders shall be placed so as not to obstruct the laying or removal of hose from the storage area.

## 6.3 **Compartmentation :**

6.3.1 Any enclosed external compartments shall be weather resistant and ventilated and have provisions for drainage of moisture.

6.3.2 All electrical junctions or wiring within compartments shall be protected from mechanical damage resulting from equipment stored in the compartment.

## 6.4 **Radio Space :**

6.4.1 A protected space or compartment shall be provided in driver's cabin for the installation of radio equipment.

6.5 **Equipment compartments:**

6.5.1 Equipment holders or compartments shall be provided for all tools, equipment, and other items that are on the Tender.
6.5.2 Equipment holders shall be attached and shall be designed so that equipment remains in place under all vehicle operating conditions.
6.5.3 All tools and equipment shall be readily accessible.

6.6 **SCBA Storage :**

6.6.1 Storage of complete SCBA units or SCBA cylinders shall be arranged so as to prevent damage, injury, or abrasion to the SCBA from other equipment stored in the general area.
6.6.2 If a SCBA unit or cylinder is stored within a crew compartment, the mounting shall comply with the requirements
6.6.3 If the SCBA cylinder is mounted in a vertical position with the valve down, it shall be supported with a brace or yoke under the cylinder or valve area to prevent downward movement.
6.6.4 The holding or clamping device shall not injure, wear, scrape, or otherwise affect the SCBA unit or cylinder, including damage to the paint or reflective finish, while the cylinder is being placed in, stored in, or removed from the holder.
6.6.5 The SCBA storage area shall be a ventilated, dry area away from all heat sources that could damage the SCBA (e.g., mufflers, engines).

6.7 **Pump and Plumbing Access :**

6.7.1 **WATER PIPING :**

6.7.1.1 Water piping shall be of stainless steel 316 grade.
6.7.1.2 Pipes, fittings and valves in the water circuit that will come in contact with foam solution (water/foam mixture) shall be of SS-316.
6.7.1.3 Stainless Steel lines joint: - the bolting (studs, bolts) at break flanges shall be of SS-316 with SS washers.
6.7.1.4 A flow chart/schematic diagram shall be made and supplied with the tender.

6.8 One or more doors or panels that open or are removable without the use of tools shall be provided to allow visual inspection or access for checking the fire pump and plumbing area.
6.9 The clear opening shall have no one dimension measure less than 18 in. (460 mm).
6.10 Additional door(s) or panel(s) that requires no more than standard tools to be opened or removed shall be provided for access to the pump and plumbing area.
6.11 All valves, gauges, controls, and other plumbing equipment shall be accessible for service and replacement.
6.12 The clear space required by the pump manufacturer to perform in-truck overhaul and maintenance shall be provided.

6.13 **Stepping, Standing and Walking Surfaces :**

6.13.1 Steps, platforms, or permanently attached ladders shall be provided so that fire fighters have access to all working and storage areas of the Tender.

6.13.2 The maximum stepping height shall not exceed 18 in. (460 mm), with the exception of the ground to first step, which shall not exceed 24 in. (610 mm).

6.13.3 A permanently attached supplemental access/egress means from the ground to these steps, platforms, or permanently attached ladders shall be provided where the ground to the first
step, platform, or ladder exceeds 24 in. (610 mm).

6.13.4 The supplemental access means shall consist of a step(s), platform(s), or ladder(s).

6.13.5 Where the Tender is supplied with stabilizers, the ground to first step height shall be determined with the Tender on level ground and the stabilizers deployed in accordance with the manufacturer's instructions so that the aerial device meets the stability requirements

6.13.6 All ladders shall have at least 7 in. (175 mm) of clearance between any rung and the body or other obstruction.

6.13.7 All steps, platforms, or ladders shall sustain a minimum static load of 500 lb (227 kg) without deformation.

6.14 Slip Resistance All materials used for exterior surfaces designated as stepping, standing, and walking areas and all interior steps shall have slip resistance.

6.15 All materials used for interior floors shall have slip resistance.

6.16 **Access Handrails :**

6.16.1 Access handrails shall be provided at each entrance to a driving or crew compartment and at each position where steps or ladders for climbing are located.

6.16.2 Access handrails shall be constructed of, or covered with, a slip-resistant, noncorrosive material.

6.16.3 Handrails shall be between 1 in. and 1 in. (25 mm and 42 mm) in diameter and have a minimum clearance between the handrails and any surface of at least 2 in. (52 mm).

6.16.4 All handrails shall be designed and mounted to reduce the possibility of hand slippage and to avoid snagging of hose, equipment, or clothing.

6.17 **Metal Finish :**

6.17.1 Where dissimilar metals that pose a galvanic corrosion or reactive threat are to be mounted together, the mounting base material shall have an isolation barrier prior to assembly to prevent dissimilar metal reaction.

6.18 **PAINTING AND MARKING :**

6.18.1 Vehicle should be painted with 2 coats of zinc phosphate epoxy primer each of 50 microns DFT and two coats of polyurethane finished red paint each coat of 50 microns DFT

6.18.2 All the lockers / cabins shall be provided with Stainless steel Name Plates with letters itched on it boldly indicating the content.

6.18.3 Water & foam lines should be painted with of zinc phosphate epoxy primer each of 50 microns DFT and two coats of polyurethane finished paint each coat of 50 microns DFT. Water lines shall be painted red in colour & foam lines shall be painted yellow in colour

6.18.4 Paint shall be of Asian/Burger/Akzonoble/3M make only

6.18.5 Owner's emblem in original colour together with name (in Hindi and English) as below shall be written in golden yellow colour on both sides of the vehicle.

6.18.6 On the front of the vehicle "FOAM TENDER" shall be written IN ENGLISH.

6.18.7 The inside of lockers shall be painted in pale Cream colour.

6.18.8 The chassis frame shall be painted black and wheel arch shall be painted white.

6.18.9 Mud flappers of sufficient length and width shall be provided at wheels.

6.18.10 Under frame of Chassis shall be painted with chlorinated rubber paint.

6.18.11 The appliance shall be clearly having the following marks at suitable locations.

(a) Manufacturer's name & trade mark.
(b) Year of manufacture
(c) Pump serial numbers and capacities.
(d) Capacity of water tank and foam compound tank in liters.
(e) Engine and chassis number.
(f) All instrument control & valves shall be identified with properly itched metallic Name plates.
(g) All valves and hoses inlet and outlet shall also be identified by suitable metallic Nameplates.

6.18.12 All exposed ferrous metal surfaces that are not plated or stainless steel shall be cleaned and prepared and shall be painted or coated.

6.18.13 The paint or coating, including any primer, shall be applied in accordance with the paint or coating manufacturer's recommendation.

6.18.14 A reflective stripe(s) shall be affixed to the perimeter of the Tender.

6.18.15 The stripe or combination of stripes shall be a minimum of 4 in. (100 mm) in total width and shall conform the requirements.

6.18.16 At least 50 percent of the cab and body length on each side, at least 50 percent of the width of the rear, and at least 25 percent of the width of the front of the Tender shall have the reflective material affixed to it.

## 7.0 Fire Water Pump and Associated Equipment :

### 7.1 General :

7.1.1 The water pump with automatic priming device shall be imported & suitable series of GODIVA/ Rosenbauer make. Primer shall be automatic water ring type primer from the same manufacturer as that of pump.

7.1.2 The pump shall be, single stage & centrifugal type.

7.1.3 The pump should be capable of delivering minimum 8000 LPM at 10 Kg/Cm2 (g) at discharges flange. Vendor shall match other parameters of operation w.r.t. Engine of the chassis.

7.1.4 The pump shall be capable of taking suction from:

- Water Tank mounted on chassis. (In normal condition).

- Underground reservoir through flexible suction line with suction lift up to 7.5 M with aid to automatic water ring type primer.

7.1.5 The pump shall be rear mounted and shall be accessible and readily removable for repair and maintenance. It shall be driven by the chassis diesel engine through a power take-off unit and propeller shaft.

7.1.6 The pump shall be of rigid construction. Pump Casing shall be of gunmetal. Impeller shall be closed type and made of bronze. The impeller and casing wear rings shall be renewable type. The pump shaft shall be stainless steel (SS-410) and shall be carried in anti-friction bearings. The pump shall have self-adjusting type mechanical seal, which shall be capable of running dry for one minute. Pump shall be self-venting type and shall have facility to drain water/sludge from the casing.

7.1.7 The primer shall be capable of lifting water at least through 7.5M depth (Suction lift) at a rate of not less than 30 cm per second in the suction line. The auto primer should work satisfactory even if it is left dry for long period.

7.1.8 The pump inlet suction line should be so sized and oriented to facilitate suction.

7.1.9 The pump discharge shall be able to be routed to :

- 6 Nos. outlets (on rear side of vehicle along with control panel) each fitted with SS AUDCO ball valves and ending in ISI marked 63MM, SS instantaneous female coupling fitted with stainless steel end caps by suitable chain link/ suitable flexible steel rope cable.
- The outlets should be angled around 30 deg. towards downward direction.
- Water-cum-Foam Monitor fitted on top of vehicle.
- Hose reel.

7.1.10 The pump shall have a suitable box type suction strainer made of Stainless steel. The strainer should easily be removable for maintenance.

## 7.2 Design and Performance Requirements :

7.2.1 **Fire Pump Rated Capacity:** The fire pump shall be mounted on the Tender and shall have a minimum rated capacity of 8000 L/min at 10 Kgf/cm2 net pump pressure.

7.2.2 **Pumping System Capability** : The pumping system provided shall be capable of delivering the following:

(1) One hundred percent of rated capacity at 10.54 kgf/cm2 net pump pressure.

(2) Seventy percent of rated capacity at 14.06 kgf/cm2 net pump pressure.

(3) Fifty percent of rated capacity at 17.57 kgf/cm2 net pump pressure.

7.2.3 **Vacuum :**

7.2.3.1 The completed pumping system shall be capable of developing a vacuum of .76 kgf/cm2 by means of the pump priming device and sustaining the vacuum for at least 5 minutes with a loss not to exceed .34 kgf/cm2

7.2.3.2 The requirement in 7.2.3.3.1 shall be met with all intake valves open, all intakes capped or plugged, and all discharge caps removed and without the use of the pump primer during the 5 minute period.

7.2.4 **Pump Suction Capability :**

7.2.4.1 The pump manufacturer shall certify that the fire pump is capable of pumping 100 percent of rated capacity at 10.5 kgf/cm2 net pump pressure from draft through 6 m of suction hose with a strainer attached.

7.2.5 **Pumping Engine Requirements :**

7.2.5.1 The Tender manufacturer shall approve the use of the pumping engine for stationary pumping applications based on the size of the "Foam Tender" and the rating of the pump being furnished.

7.2.6 **Supplementary heat exchanger cooling system shall be provided for the pump drive engine:**

7.2.6.1 Valving shall be installed to permit water from the discharge side of the pump to cool the coolant circulating through the engine cooling system without intermixing.

7.2.6.2 The heat exchanger shall maintain the temperature of the coolant in the pump drive engine not in excess of the engine manufacturer's temperature rating under all pumping conditions.

7.2.7 **Power Train Capability :**

7.2.7.1 All components in the power train from the engine to the fire pump shall be capable of transmitting the torque necessary to power the pump, as installed in the Tender, for the pump performance without exceeding the component manufacturer's continuous duty torque rating.

7.2.7.2 When pumping continuously at each of the pump performance points, lubricant temperatures in any power train component installed in the Tender from the engine to the pump shall not exceed the component manufacturer's recommendation for maximum temperature.

7.2.7.3 A means shall be provided to limit the nominal net engine output to a torque level equal to the nominal continuous duty torque rating of the weakest component, or to a level equal to the sum of the nominal continuous duty torque ratings of multiple components, if there are multiple devices to be driven simultaneously.

7.2.8 **Intake Strainer :**

7.2.8.1 Each intake shall have a removable or accessible strainer inside the connection.

7.2.8.2 The strainer(s) shall restrict spherical debris that is too large to pass through the pump.

7.2.8.3 Intakes having male threads shall be equipped with caps; intakes having female threads shall be equipped with plugs but remain secured to the Tender by means of suitable connection.

7.2.9 **Discharge Outlet Connections :**

7.2.9.1 Caps or closures for outlets in size shall be removable from the outlet but remain secured to the Tender

7.2.10 **Pump Drains :**

7.2.10.1 A readily accessible drain valve(s) that is marked with a label as to its function shall be provided to allow for draining of the pump and all water-carrying lines and accessories.

7.2.10.2 The drain valve(s) shall be operational without the operator having to get under the Tender.

7.2.11 **Pump Operator's Panel :**

7.2.11.1 Each pump control, gauge, and other instrument necessary to operate the pump shall be located on a panel known as the pump operator's panel and shall be marked with a label as to its function.

7.2.11.2 All gauges, discharge outlets, pump intakes, and controls shall be illuminated.

7.2.12 **Instrumentation :**

7.2.12.1 **Pump Operator's Panel:** The following controls and instruments shall be provided and installed as a group at the pump operator's panel:

(1) A master pump intake pressure–indicating device
(2) A master pump discharge pressure–indicating device
(3) A pumping engine tachometer
(4) A pumping engine coolant temperature indicator
(5) A pumping engine oil pressure indicator
(6) A voltmeter
(7) The pump pressure control(s)
(8) The pumping engine throttle
(9) The primer control
(10) The water tank–to–pump valve control
(11) The water tank fill valve control
(12) The water & foam tank level indicator

7.2.12.2 The instruments and controls required by 7.12.1.1 shall be placed so as to keep the pump operator as far as practicable from all discharge and intake connections and in a location where the instruments and controls are visible and operationally functional while the operator remains stationary.

7.2.12.3 Any instrumentation exposed to the elements shall be weatherproof. The pumping engine oil pressure and engine coolant temperature indicators shall be equipped with audible and visual warnings.

7.2.12.4 All engine operation indicators on the pump operator's panel shall be in addition to those on the vehicle's instrument panel.

7.2.12.5 Analog pressure gauges shall be vibration and pressure pulsation dampened; be resistant to corrosion, condensation, and shock; and have internal mechanisms that are factory lubricated for the life of the gauge.

7.2.12.6 Each pressure-indicating device or flow meter, and its respective display, shall be mounted and attached so it is protected from accidental damage and excessive vibration.

7.2.13 **Required Testing :**

(a) Pump Certification
(b) Pumping Test
(c) Pressure Control System Test
(d) Priming Device Tests
(e) Vacuum Test
(f) Water Tank–to–Pump Flow Test.
(g) Foam tank-to-pump flow test
(h) Manufacturer's Pre-delivery Test.
(i) The manufacturer shall conduct a piping hydrostatic test prior to delivery of the Tender.

## 7.3 SPARES :

The following mandatory spares shall be supplied by the vendor:

### 7.3.1 FOR WATER PUMP :

7.3.1.1 Pump Shaft with keys & impeller nut- 1 No
7.3.1.2 Impeller- 1 No.
7.3.1.3 Shaft sleeve- 3 Nos.
7.3.1.4 Set of DE & NDE bearings- 3 Sets
7.3.1.5 "O" Ring – 10 Nos.
**7.3.1.6 Mechanical seal spares :**
- Rotating & stationary faces with packing -2 Sets
- Springs pins, gaskets etc- 2 Sets.
7.3.1.7 Couplings between PTO Unit & Pump- 2 Nos. (one of each type)
7.3.1.8 Oil Seal – 10 Nos.

## 7.4 WATER / FOAM MONITOR (Non-Aspirating Jet cum Spray Type) :

7.4.1 A joystick operated remote controlled foam-cum water monitor with manual override shall be mounted on rooftop of the "Foam Tender" having following specification:

(a) Make & Model: Cobra EXM - ELKHART Make as per OEM standard including MOC.
(b) Discharge Capacity: Min. 1000 US GPM at 75 PSI.
(c) Variable flow ~ 350 GPM to 1000 GPM Aqua foam / Fog type.

(d) Monitor shall be constructed from lightweight cast aluminum with a veined waterway with variable cross-sectional producing a friction loss of less than 22 psi at 1000 GPM; shall be constructed with thrust rods and thrust bearings on both horizontal and vertical rotational joints for improved product longevity; shall have two (2) NEMA 4 rated sealed gear motors that allow for simultaneous vertical and horizontal adjustment, one motor shall control the continuous 350 degree horizontal rotation while the other motor shall control the - 90 degree to +100 degree vertical rotation from horizontal; horizontal and vertical motors shall have a manual override device for use in the event of power failure; electric controls shall be NEMA 4 rated and allow for programmable horizontal center position, horizontal stops, stow position, block-out zones, and motor speeds fast or slow; electric control shall allow for horizontal and vertical automatic oscillation, electric control shall be CAN and/or radio frequency compatible; electric control shall be compatible with both 12VDC and 24VDC power supply. Nozzle should be hard anodized and automatically adjusts to maintain effective stream and maximum reach at variable or reduced flows. Nozzle should Flow (Min) from 350-1000 GPM and Calibrated at lower pressures — 75 and 80 psi — for better suitability. Constant flow — straight stream, narrow fog (30°), or wide fog (90°) — with hydrodynamic vanes and hub for increased flow efficiency. Electric motors and connectors are completely sealed, with manual overrides. Monitor Shall supply with following accessories:-

(a) Full functional proportional joystick.
(b) Hand held wireless remote controller.
(c) Uni-body butterfly valve with electric actuator control on joystick.
(d) Foam Expansion Tube

7.4.2 Separate connection shall be made to operate Foam/Water Monitor directly from pressurized hydrant mains by means of suitably sized inlet line 4 nos., 63MM, ISI marked instantaneous male connectors with strainer and AUDCO Make SS ball valves, fitted on the rear side of the Foam Tender, shall be connected to the Monitor line with a isolation valve.

## 7.5 **HOSE REEL :**

7.5.1 One first aid hose reel shall be provided and mounted so as to be accessible for use from either side of the appliance. Guide rollers shall be fitted, where necessary, to prevent tubing from kinking.

7.5.2 Hose reel shall have 65 mtrs. of 19MM bore tubing hose terminating in a dual-purpose jet cum spray ,shut-off nozzle of stainless steel. The throw from hose reel shall be 10M min. Crow foot coupling shall be used to couple one end of the hose to the hose reel and other to the shut off nozzle. The tubing shall confirm to IS: 5132-1969 and hose reel shall conform to IS 884-1985.

7.5.3 The reel shall be provided with friction breaks to prevent over-run of tubing without affecting easy run of the reel. It shall be possible to declutch the break

for rewinding. Design shall be reliable and permit adjustment for wear and friction force to suit and use

7.5.4 Plumbing between the pump and hose reel shall have clean and unobstructed waterway of not less than 23 mm throughout any restriction

7.5.5 The working pressure of the tubing shall not be less than 15 Kg/Cm2 (G).

7.5.6 Flow to the reel shall be controlled by manually operated SS ball valve located suitably for ease of operation.

## 8.0 Water Tank

8.1 **WATER TANK :**

8.1.1 The water tank shall be mounted on the chassis, keeping in view proper load distribution of the chassis.

8.1.2 It shall be of die-pressed stiffened construction and fabricated out of SS-316. All sides should be of die-pressed stiffened construction.

8.1.3 The bolting shall be so designed and mounted as to bring the centre of gravity of the appliance as low as possible.

8.1.4 The mounting shall permit full rated contents of the tank to flow into the pump.

8.1.5 The mounting of the tank should be such that it prevents the tank distortion due to chassis flexion.

8.1.6 The complete tank should be painted externally after fabrication.

8.1.7 Net capacity of water tank shall be of 6000 litres. In addition a 2% expansion space shall be made in the water tank over & above the water capacity. A calibrated dip tape shall be provided on the tank to measure the tank level

8.1.8 The water tank shall be fabricated out of minimum 5MM thick SS-316 plates for the bottom & 4 MM thick SS-316 plates for the sides & top. The tank shall be of welded construction and shall be suitably stiffened with SS 316 angles/flats so as to avoid buckling and distortion.

8.1.9 The tank shall have baffles, of minimum 3MM thickness, SS-316 plates, so as to avoid water surging due to movement of vehicle. Baffle plates will be connected to the tank with SS nuts & bolts. The threads of bolts shall be TAC welded beyond the nut to prevent the nuts falling in the tank due to vibrations.

8.1.10 Tank shall be provided with anti-vortex device at the nozzle for pump suction.

8.1.11 An inspection manhole of 500MM size shall be provided on top with a hinged and bolt able cover with suitable gasket. The manhole shall be fitted with SS nameplate having etched marking 'WATER' (letter size 100MM).

8.1.12 Suitable lifting lugs shall be provided on the tank shell to enable it to be lifted off the vehicle for repairs/replacement as necessary.

8.1.13 The tank shall be fitted with a sludge trap. The bottom of the tank shall have a slight slope towards the sludge trap.

8.1.14 The tank shall also have a cleaning hole of 250MM dia. Manhole shall be fitted with 50MM drain pipe with AUDCO make SS ball valve and 63MM (SS) ISI marked instantaneous male coupling incorporated in it

8.1.15 The tank shall be fitted with overflow pipes of not less than 100mm diameter and the discharge end shall be taken below the chassis without reducing the effective ground clearance. The overflow pipe shall be routed to outside water tank. The overflow shall taken down a point well below the chassis without reducing effective ground clearance when duly loaded and shall discharge

away from the wheel, the pipe shall be so designed and located to ensure that water will overflow through the pipe only while refilling the tank, but no water shall overflow through this pipe when the appliance is in motion or is standing on uneven ground and/or brakes are applied to the moving appliance.

8.1.16 The tank shall be filled by means of suitably sized inlet line from pressurized hydrant mains. 8 nos. 63MM ISI marked, SS instantaneous male connectors (4 on each side of the foam/water tender) with strainer shall be connected to the filling line. The inlet lines will be provided from AUDCO Make SS ball valve. Water filling arrangement to the tank shall be provided from upper side of the tank only and the filling line shall be routed to outside water tank.

8.1.17 The tank shall have an adequately sized breather valve. The inlet line in the tank shall have an adequately strong deflector plate, which will avoid the incoming jet of water from hitting the tank sides/bottom.

8.1.18 All nozzles for the tank shall have suitable reinforcement pads. Nozzles shall also have adequate stiffeners to take the loads from piping.

8.1.19 Tank supporting structure on the chassis shall be of SS-316.

8.1.20 Reinforcement pads at tank supporting structure shall be of same thickness and material as that of the water tank.

8.1.21 Suitable strainer (SS) shall be provided at the tank bottom on pump suction line.

8.1.22 Provision shall be made on either side of the body for visual inspection/maintenance of the water tank.

8.1.23 **Tank Construction & mounting :**

8.1.23.1 All water tanks shall be constructed of noncorrosive material or other materials that are protected against corrosion and deterioration.

8.1.23.2 The water tanks shall have a means to permit cleaning of the tank.

8.1.23.3 Water tank should be independent of the body and compartments, it shall be equipped with a method for lifting the tank(s) off of the chassis.

8.1.23.4 Tanks shall be cradled, cushioned, spring-mounted, or otherwise protected from undue stress resulting from travel on uneven terrain

8.1.23.5 All water tanks shall be provided with baffles to form a containment or dynamic method of water movement control.

8.1.23.6 Containment method of baffling should be used, a minimum of two transverse or longitudinal vertical baffles shall be provided.

8.1.23.7 There shall be a maximum distance of 48 in. (1220 mm) between any combination of tank vertical walls and baffles.

8.1.23.8 Each baffle shall cover at least 75 percent of the area of the plane that contains the baffle.

8.1.23.9 The water tank will be mounted on the vehicle on a sub frame using Rubber Metacones. This sub frame will be made from Anti-Corrosive Treated i.e. Hot Dip Galvanized MS 4" section and will be bolted with the chassis using the high tensile

bolts. 'U' Bolts shall not be used for mounting of tanks on vehicle. The tank shall be mounted on the vehicle using Metacone mountings. The rubber metacones shall facilitate to absorb the jerks and bending torsions in expansion as well as compression mode without high deflection. The manufacturer shall provide complete design data of metacones and sub frame including the load calculations and metacone quantity sufficiency. Tank will be mounted on the chassis in a manner keeping in view the proper load distribution on the axles. The baffles will be arranged in a manner to facilitate easy cleaning of the tanks. The tank will be mounted on two / three cross bearers to counteract stresses caused by chassis flexing. The Centre of Gravity shall be maintained as low as possible.

8.1.23.10 The water tank with all its fitments shall withstand/hydrostatic pressure of 0.3 bar/kg. Sq. cm.

8.1.23.11 Suitable arrangement should be provided for self-filling of water tank directly from the pump. The tank should be connected to the pump through a pipeline fitted with inverted stainless steel strainer and lever operated ball valves.

8.1.24 **Cleanout Sumps :**

8.1.24.1 One cleanout sumps shall be provided.

8.1.24.2 A 3 in. (75 mm) or larger removable pipe plug shall be furnished in each sump.

8.1.25 **Water Level Indicator :**

8.1.25.1 An indicator shall be provided that shows the level or amount of water in the tank(s).

8.1.25.2 A mechanical (dial type) level gauge also to be provided.

8.1.25.3 A suitably protected water level indicator of the graduated glass tube, clear acrylic shall be provided close to the control panel. Isolation valve shall be provided just after the tap off point near the water tank for the level indicator.

8.1.25.4 Electronic LED Water Level Indicators indicating the tank levels as EMPTY, ¼, ½ , ¾ and FULL shall be provided on the pump control panel. These levels shall be indicated by number of glowing LED lights (no LED Lights means and empty tank, All LED Lights means full tank). The indicators shall sense the fluid level in the tank with help of a pressure sensing probe. The indicators shall be located on the rear pump control panel in such a manner that the Operator / Firemen can easily view the tank levels while being away from the vehicle. Repeater Secondary Level Indicators shall be provided in the driver's cab to help the crew members to check the fluid level from the cab while travelling.

8.1.26 **Tank-to-Pump Intake Line :**

8.1.26.1 If the Tender is equipped with a pump, the water tank shall be connected to the intake side of the pump with a valve controlled at the pump operator's position.

8.1.26.2 An automatic means (i.e. NRV) shall be provided in the tank-to-pump line that prevents unintentional backfilling of the water tank through that line.

**8.1.26.3 Filling and Venting :**

(a) **Fill Opening:** - A convenient covered fill opening designed to prevent spillage shall be provided.

(b) Vent/Overflow Outlet: - A vent/overflow outlet that is sized to allow water to be drawn from the tank.

(c) Tank Fill Line: - A valved tank fill line shall be provided.

(d) External Fill: - An external fill connection leading directly to the tank shall be provided.

(e) The external fill connection shall be provided with a removable or accessible strainer, a shutoff valve capable of being throttled, a minimum 30-degree sweep elbow positioned downward, and a closure cap or plug.

8.1.27 **Water Tank Capacity Certification :**

8.1.27.1 The manufacturer shall certify the capacity of the water tank prior to delivery of the Tender.

8.1.27.2 The certified capacity shall be recorded on the manufacturer's record of construction and the certification shall be provided to the OIL when the Tender is delivered.

## 9.0 Foam Proportioning Systems :

### 9.1 Requirements by Type of Foam Proportioning System :

9.1.1 Around-the-Pump System. An around-the-pump foam proportioning system shall meet the requirements.

9.1.2 Balanced Pressure System. A balanced pressure foam proportioning system shall meet the requirements.

9.1.3 The foam proportionating system will be Balance Pressure Foam Proportioning type, which can automatically proportion the foam compound to the water according to the pressure of water. The balance pressure foam-proportionating device should be able to inject foam in a ratio 1-6% by means of a duly calibrated metering device

9.1.4 Each of the 6 outlets from the tender and outlet for the foam/water monitor shall get foam supply by independent balance pressure foam proportionating device.

9.1.5 The pressure drop on foam side across the balance pressure foam-proportionating device shall not be more than 1.5KG/CM2 (G).

9.1.6 An independent around the pump foam proportioning system shall also be provided with three settings of metering device, Made of Gun metal, as 1%, 3% &6%.

9.1.7 The bidder shall provide with complete technical details of the foam system along with installation piping diagram of the foam system.

## 9.2 AUXILIARY FOAM INDUCTION DEVICE :

9.2.1 Three Nos. induction devices operated through hydrant water are required for directly picking up foam from foam tank. Induction device should induct 3% foam at the inlet water pressure of 7.00KG/CM2 (G). The motive water can be taken from the common header, which feeds hydrant water to water tank.

9.2.2 Induction device (2 Nos.) shall have its outlet connected to 1 No. 63MM female instantaneous coupling (SS) located at each side of the vehicle. These should be able to feed foam to FB-10X branch operate optimally.

9.2.3 Third device shall feed 3% foam to water/foam monitor installed at top of vehicle

9.2.4 One AUDCO make SS-316 ball have of suitable size shall be provided on foam line between foam tank and each inductor.

## 9.3 PIPING :

9.3.1 All piping shall be designed to have minimum pressure drop and achieve the required pressure and flow at various locations.

9.3.2 All piping shall be seamless and designed for 10% over the maximum pressures encountered in the pipe. All lines shall be hydraulically tested at 1.5 times the design pressure and shall be to hold the pressure for minimum 2 hours. However, in no case shall the lines be hydraulically tested below 25 KG/CM2 (G) pressure.

9.3.3 The piping shall be flanged for ease of maintenance. However, joints to be kept minimum.

9.3.4 Valves of less than 1.5 inch size shall be forged construction and valve more than 2" size or more size shall be of cast construction.

9.3.5 All lines shall be suitably supported so as to provide rigidity and avoid vibrations.

9.3.6 Al lines less than 1.5" NB size can be socket welded to matching 3000 LBS rating fittings. All lines above 2" NB size shall be butts welded with full penetration welds.

### 9.3.7 FOAM PIPING :

9.3.7.1 Total piping in foam circuit shall be of SS-316.

9.3.7.2 All ball valves in foam circuit shall be of AUDCO make SS-316 with Teflon seats.

9.3.7.3 All gaskets in foam lines shall be spiral wounds with SS-304 and asbestos filler.

9.3.7.4 All Nuts, bolts & washers shall be of SS-316.

9.3.7.5 Provision shall be kept for flushing the foam lines with water from on board water pump and from external source.

9.3.7.6 A Stainless Steel Y- type strainer shall be provided before the foam pump. The strainer shall be so located so as to permit easy removal of strainer element.

## 9.4 Design and Performance Requirements of a Foam System :

9.4.1 The proportioning system shall be capable of proportioning foam concentrate(s) in accordance with the foam concentrate manufacturer's recommendations for the type of foam concentrate used in the system over the system's design range of flow and pressures.

9.4.2 The Tender shall be capable of supplying the power required by the foam proportioning system in addition to the requirements of the other power-dependent systems installed on the Tender.

9.4.3 Components that are continuously wetted with foam concentrate shall be constructed of materials that will not be damaged in form, fit, or function when exposed to foam concentrates, including the adverse effects of corrosion, formation of harmful solids, deterioration of gaskets and seals, binding of moving parts, and deterioration of the foam concentrate caused by contact with incompatible materials.

9.4.4 The foam proportioning components that can be flushed with water after use shall be constructed of materials that do not corrode after being flushed with water and allowed to dry. These components shall also be constructed of materials resistant to deterioration by foam concentrates.

9.4.5 The foam concentrate supply line shall not collapse under any operating conditions specified by the manufacturer of the foam proportioning system.

9.4.6 A means shall be provided to prevent water backflow into the foam proportioning system and the foam concentrate storage tank.

9.4.7 A device that consists of a removable element that does not restrict the full flow capacity of the foam supply line shall be provided on the foam concentrate supply side of the foam proportioner to prevent any debris that might affect the operation of the foam proportioning system from entering the system.

## 9.5 Flush Lines :

9.5.1 A foam concentrate system flush line(s) shall be provided as required

9.5.2 A means shall be provided in the flush line(s) to prevent water backflow into the foam concentrate tank or water tank during the flushing operation.

## 9.6 Controls for Foam Systems:

9.6.1 The foam proportioning system operating controls shall be located at the pump operator's panel

9.6.2 Foam proportioning systems that require flushing after use shall be provided with controls accessible to the operator to completely flush the system with water

9.6.3 Foam proportioning systems that incorporate foam concentrate metering valves shall have each metering valve calibrated and marked with a plate to

indicate the rate(s) of the foam concentrate proportioning available as determined by the design of the system.

## 9.7 Foam System Pressure-Indicating Devices, Flow meters and Indicators :

9.7.1 The displays of all pressure-indicating devices, flow meters, and other indicators (e.g., fluid-level indicators) shall be located so that they are visible from the pump operator's position

9.7.2 Analog pressure gauges (If) shall be vibration and pressure pulsation dampened; be resistant to corrosion, condensation, and shock; and have internal mechanisms that are factory lubricated for the life of the gauge.

## 9.8 Atmospheric Foam Concentrate Tank :

9.8.1 The Foam tank shall be mounted on the chassis, keeping in view proper load distribution of the chassis.

9.8.2 It shall be of die-pressed stiffened construction and fabricated out of SS-316. All sides should be of die-pressed stiffened construction.

9.8.3 The bolting shall be so designed and mounted as to bring the centre of gravity of the appliance as low as possible.

9.8.4 The mounting shall permit full rated contents of the tank to flow into the pump.

9.8.5 The mounting of the tank should be such that it prevents the tank distortion due to chassis flexion.

9.8.6 The complete tank should be painted externally after fabrication.

9.8.7 The foam compound tank of 3000 liters net capacity shall be fabricated out of 5MM thick SS-316 plates for the bottom & 4 MM thick SS-316 for the sides & top. In addition 2% of expansion space shall be made in the tank, over and above foam compound capacity.

9.8.8 The foam tank shall be of welded construction and shall be suitably stiffened with SS 316 angles/flats so as to avoid buckling and distortion.

9.8.9 The tank shall have baffles of 3MM thick, SS-316 plates, so as to avoid surging due to movement of vehicle. Baffle plates will be connected to the tank with SS nut/bolts. The threads of bolts shall be TAC welded beyond the nut to prevent them falling inside the tank due to vibration.

9.8.10 Suitable lifting lugs shall be provided on the tank shell to enable it to be lifted off the vehicle for repairs/replacement as necessary.

9.8.11 The tank shall be fitted with a sludge trap The bottom of the tank shall have a slight slope towards the sludge trap.

9.8.12 The tank shall also have a cleaning hole of 250MM dia and 50MM-drain pipe with AUDCO make S.S. ball valve and 63MM (SS) instantaneous male coupling incorporated in it.

9.8.13 The tank shall have a filling hole of 150MM diameter at top and with a removable conical strainer of SS-316. The filling manhole shall have a screwed cap. The filler cap shall have an etched SS name plates with marking ‘FOAM’. A calibrated dip tape shall be provided on the tank to measure the tank level.

9.8.14 The tank shall be provided with 500 MM-dia-inspection manhole with hinged and bolt cover with suitable gasket

9.8.15 Breather valve shall be provided for automatic venting of the foam compound tank when the foam compound is drawn from it or when the tank is being filled.

9.8.16 The inlet line in the tank shall have an adequately strong deflector plate, which will avoid the incoming jet of foam from hitting the tank side/roof.

9.8.17 All nozzles for the tank shall have suitable reinforcement pads. Nozzles shall also have adequate stiffeners to take the loads from piping. Tank shall be provided with anti vortex device at nozzle for pump suction.

9.8.18 Tank supporting structure on the chassis shall be of SS 316.

9.8.19 Reinforcement pads at tank supporting structure shall be of same thickness and material as that of the foam tank

9.8.20 Provision shall be made on either side of the body for visual inspection/maintenance of the foam tank.

**Foam Level Indicator(10.8.15 – 10.8.18)**

9.8.21 An indicator shall be provided that shows the level or amount of water in the tank(s).

9.8.22 A mechanical (dial type) type level gauge to be provided.

9.8.23 A foam level indicator of the graduated glass tube (suitable protected) shall be provided close to the control panel. Isolation valve shall be provided just after the tap off point near the foam tank for the level indicator

9.8.24 Electronic LED Foam Level Indicators indicating the tank levels as EMPTY, ¼, ½ , ¾ and FULL shall be provided on the pump control panel. These levels shall be indicated by number of glowing LED lights (no LED Lights means and empty tank, All LED Lights means full tank). The indicators shall sense the fluid level in the tank with help of a pressure sensing probe. The indicators shall be located on the rear pump control panel in such a manner that the Operator / Firemen can easily view the tank levels while being away from the vehicle. Repeater Secondary Level Indicators shall be provided in the driver's cab to help the crew members to check the fluid level from the cab while travelling.

9.8.25 A calibrated dip tape shall be provided on the tank to measure the tank level.

9.8.26 Suitable strainer (SS) shall be provided at the tank bottom on pump suction line, a dial type level gauge also to be provided.

9.8.27 The foam concentrate tank(s) shall be constructed of noncorrosive materials or other materials that are protected against corrosion or deterioration and that will not be adversely affected by the foam concentrate to be stored in the tank.

9.8.28 The foam concentrate tank shall be provided with a fill tower or expansion compartment having a minimum area of 12 in.2 (7500 mm2) and having a volume of not less than 1 percent of the total tank volume.

9.8.29 The fill tower opening shall be protected by a completely sealed airtight cover.

9.8.30 The cover shall be attached to the fill tower by mechanical means.

9.8.31 The fill opening shall incorporate a removable screen with a mesh not to exceed ¼ in. (6 mm) and shall be arranged so that foam concentrate from a 5 gal (19 L) container can be dumped directly to the bottom of the tank to minimize aeration without the use of funnels or other special devices.

9.8.32 The fill tower shall be equipped with a pressure/vacuum vent that enables the tank to compensate for changes in pressure or vacuum when filling or withdrawing foam concentrate from the tank.

9.8.33 The pressure/vacuum vent shall not allow atmospheric air to enter the foam tank except during operation or to compensate for thermal fluctuations.

9.8.34 The vent shall be protected to prevent foam concentrate from escaping or directly contacting the vent at any time.

9.8.35 The vent shall be of sufficient size to prevent tank damage during filling or foam withdrawal.

9.8.36 The foam concentrate tank shall not be equipped with an overflow pipe or any direct opening to the atmosphere.

9.8.37 The foam concentrate tank(s) shall be designed and constructed to facilitate complete interior flushing and cleaning as required.

9.8.38 **Tank Drain :**

9.8.38.1 A minimum 1 in. (25 mm) inside diameter full flow drain valve and piping shall be provided at the lowest point of any foam concentrate tank.

9.8.38.2 The drain shall be piped to drain directly to the surface beneath the Tender without contacting other body or chassis components.

9.8.39 The foam concentrate tank shall be constructed and installed to be independent of the tender body.

9.8.40 The foam concentrate discharge system design shall prevent the siphoning of foam concentrate.

9.8.41 **Labels :**

9.8.41.1 A label that reads “Foam Tank Fill” shall be placed at or near any foam concentrate tank fill opening.

9.8.41.2 A label shall be placed at or near any foam concentrate tank fill opening that specifies the type(s) of foam concentrate the system is designed to use, any restrictions on the type(s) of foam concentrate that can be used with the system, and a warning message that reads “Warning: Do Not Mix Brands and Types of Foam.”

9.8.42 The foam concentrate tank outlet connection shall be designed and located to prevent aeration of the foam concentrate and shall allow withdrawal of 80 percent of the foam concentrate tank storage capacity under all operating conditions with the Tender on level ground.

9.8.43 The foam concentrate tank inlet connection, if provided, shall prevent aeration of the foam concentrate under all operating conditions.

9.8.44 The foam tank will be mounted on the vehicle on a sub frame using Rubber Metacones. This sub frame will be made from Anti-Corrosive Treated MS 4” section and will be bolted with the chassis using the high tensile bolts. 'U' Bolts shall not be used for mounting of tanks on vehicle. The rubber metacones shall facilitate to absorb the jerks and bending torsions in expansion as well as compression mode without high deflection. The manufacturer shall provide complete design data of metacones and sub frame including the load calculations and metacone quantity sufficiency. Tank will be mounted on the

chassis in a manner keeping in view the proper load distribution on the axles. The baffles will be arranged in a manner to facilitate easy cleaning of the tanks. The tank will be mounted on two / three cross bearers to counteract stresses caused by chassis flexing. The Centre of Gravity shall be maintained as low as possible.

## 9.9 Foam Concentrate Pump (FOAM PUMP) :

9.9.1 Pump to handle Foam Compound (AFFF/FFFP) shall be rotary gear type and EMI (Edward mfg. Inc. USA) make.

9.9.2 The pump shall be as per OEM specification and all components & materials of construction shall be as per OEM. The shaft sealing shall be as per OEM.

9.9.3 The pump shall have be minimum discharge capacity of 500 LPM at discharge pressure 14.0 KG/CM2 (G).

9.9.4 The pump shall be used to :

(a) Deliver foam compound from foam tank on chassis to the balance pressure foam proportionating system for each of the 6 outlets as mentioned in clause 4.1.9.

(b) Transfer foam compound from foam tank on chassis to other tender. One 50 mm screwed male connection (with cap) on each side of vehicle.

(c) Transfer foam compound from barrels to foam tank on chassis.

(d) Delivery foam compound from barrels kept on ground to the balance pressure foam proportionate system.

(e) Deliver foam to balance pressure foam proportionating system on top of vehicle for foam /water monitor.

9.9.5 4.2.5 The pump shall be driven by the main engine on chassis through a side power take-off unit.

9.9.6 4.2.6 The pump shall have a by-pass to route the discharge to foam tank on chassis.

9.9.7 4.2.7 The pump shall have a PSV (set at suitable pressure) for protection of pump against over pressure and PSV discharge will be routed to foam tank on chassis. PSV shall have SS-316 body and trim. Isolation valve shall be provided on downstream side of PSV.

## 9.10 SPARES :

9.10.1 The following mandatory spares shall be supplied by the vendor for foam pump:

(a) Shaft with gears- 1 Set

(b) Mechanical seal (s) complete with sleeve & gland plate etc.- 2 Nos.

(c) Mechanical seal spares- 2 Sets.

(d) Rotating & stationery faces with packing- 2 Sets.

(e) Springs pins, gaskets etc- 2 Sets

(f) Couplings between PTO Unit & Pump- 2 Nos

9.10.2 An instruction plate shall be provided for the foam proportioning system that includes, at a minimum, a piping schematic of the system and basic operating instructions.

9.10.3 Each control, gauge, and indicator necessary to operate the foam proportioning system shall be marked with a label as to its function.

9.10.4 A plate, located at the operator's position, shall provide the following information pertaining to the operating specifications of the foam proportioning system:

(a) Types of foam concentrate(s) compatible with system design
(b) Proportioning rate (percentage)
(c) Maximum/minimum water flows (LPM)
(d) Maximum/minimum operating pressures

## 9.11 **Operations and Maintenance Manual :**

9.11.1 Two copies of an operations and maintenance manual shall be provided.

9.11.2 The manual shall include a complete diagram of the system, together with operating instructions, system foam concentrate capabilities, original system calibration, and details outlining all recommended maintenance procedures.

## 9.12 **Certification and Documentation :**

9.12.1 The final installer shall certify the following:

(a) The foam system, as installed, complies with the foam equipment manufacturer's installation recommendations.
(b) The foam system has been calibrated and tested to meet the foam equipment manufacturer's and the purchaser's performance specifications.
(c) The accuracy of the foam proportioning system meets the requirements

## 9.13 **ACCESSORIES :**

### 9.13.1 **CONTROL PANEL :**

(a) All the controls for operating the vehicle and flushing system (after operation) shall be pneumatic with manual over-ride. The switches for the pneumatic valves shall be provided on the control panel. Adequately illuminated pump operating panel shall be provided at the rear side of the appliance and these shall include the following :

a. Auxiliary throttle control for the engine.
b. Independent pressure gauges calibrated to 25 KG/CM2 for each pump discharge.
c. Threaded suction inlet of water pump with blind cap.
d. Control for using the auxiliary foam compound pick up tube.
e. Engine Temperature.
f. Engine Oil pressure.
g. Quick opening valve for lining up water tank to pump.
h. Visual indication to show engagement of each PTO Unit.
i. Level gauge for water & foam tanks.
j. Priming valve for water pump.
k. System schematic etched on Stainless Steel plate.

l. Operating instruction plate and flushing out instruction plate (both on boldly etched Stainless steel plates).
m. Compound pressure gauges.
n. RPM for pumps.
o. Remote control water-cum-foam monitors control for horizontal/ vertical movements & jet/spray pattern.
p. 14.2 "Pump Engaged" indicators shall be provided both in the driving compartment and on the pump operator's panel to indicate that the pump shift has been successfully completed.

(b) In addition to the items mentioned above, vendor shall provide any other items that he may find essential. Any of these items which are also required in the driver's cabin shall be provided at suitable locations in the driver's cabin. Each lever, switch, valve, gauges, outlet/inlet etc. shall have identification made on metal plate and duly riveted. The microphone of the PA system shall be fixed inside the driver cabin on a flexible stand at a suitable location.

## 10.0 OTHERS :

10.1 ISI marked 63MM SS male instantaneous couplings (threaded) with caps provided with suitable AUDCO make SS ball valve- 6 Sets.

10.2 ISI marked 63MM SS female instantaneous couplings (threaded) with caps provided with suitable AUDCO make SS ball valve- 6 Sets.

10.3 Hydrant key for 4" Gate valve: 20 nos.

## 11.0 PERFORMANCE GUARANTEE :

11.1 The manufacturer shall guarantee the design, material, workmanship and the performance unit for a period of 12 months from date of commissioning or 18 months from the date of the supply of completed vehicle. The vendor, at owner's premises, shall rectify any mechanical defect, faulty workmanship or operational defects found during this period within reasonable time without any extra cost.

## 12.0 TRAINING :

12.1 During fabrication of Foam Tender, One week training on Operation & Maintenance, Troubleshooting and Working Principle for three personnel in two batches to be arranged at their workshop/ Plant free of cost. However, OIL will bear the expenses towards travelling and accommodation etc. of the OIL's personnel.

12.2 After supply of the vehicle, the vendor (Fabricator) shall provide one week training on Operation & Maintenance, Troubleshooting and Working Principle of Fire Tender at OIL's (owner's) site (i.e. Duliajan, Assam) and charges for the same shall be included in the price.

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PAYMENT:- 70% payment will be released against dispatch and other relevant documents as per terms and conditions of the purchase order. Balance 30% of the material cost and commissioning charges will be released after successful commissioning of the system at site.

## A. BID REJECTION CRITERIA (BRC) / BID EVALUATION CRITERIA (BEC)

The following BRC/BEC will govern the evaluation of the bids received against this tender. Bids that do not comply with stipulated BRC/BEC in full will be treated as non responsive and such bids shall prima-facie be rejected. Bid evaluation will be done only for those bids that pass through the "Bid Rejection Criteria" as stipulated in this document.

Other terms and conditions of the enquiry shall be as per General Terms and Conditions vide MM/CALCUTTA/E-01/2010 for E-Procurement LCB Tenders. However, if any of the Clauses of the Bid Rejection Criteria / Bid Evaluation Criteria (BRC / BEC) contradict the Clauses of the tender or MM/CALCUTTA/E-01/2010 elsewhere, those in the BRC / BEC shall prevail.

### A. BID REJECTION CRITERIA (BRC)

TECHNICAL

1.0 BIDDER'S QUALIFICATION

1.1 The bidder shall be a "Fabricator / Assembler" of "Fire Water Tender/ Foam Tender". Copy of "Certificate of Incorporation" / "NSIC" certificate of the firm shall be furnished along with the bid.

OR

1.2 The bidder shall be an authorized dealer/distributor in India for the "Fabricator / Assembler" of "Fire Water Tender/ Foam Tender". Copy of "Certificate of Incorporation" / "NSIC" certificate of "Fabricator / Assembler" shall be furnished along with the bid.

2.0 BIDDER'S EXPERIENCE

2.1 In case, the bidder is a "Fabricator / Assembler" of the offered "Foam Tender", the following criteria shall be met by the Bidder:-

2.1.1 The bidder should have been in the business of fabricating / assembling including commissioning of "Fire Water Tender / Foam Tender" at least 3 (Three) years preceding to the Bid Closing date of this Tender. Necessary document {i.e. Copy of

Audited Balance sheet for last 3 (Three) years} should be enclosed along with techno-commercial bid to ascertain the same.

2.1.2 The bidder should have the experience of successful execution of supply of at least 1 (One) no. Foam Tender or in combination of "Fire Water Tender / Foam Tender" with minimum 280 HP engine power or above in the last 05 (Five) years preceding to the Bid Closing date of this Tender. Necessary copy of Purchase Order and Commissioning report /Performance report should be enclosed along with bid to ascertain the same.

2.2 In case the Bidder is an authorized dealer/distributor of "Fabricator / Assembler" of "Fire Water Tender/ Foam Tender", the following criteria shall be met by the Bidder:

2.2.1 The Bidder shall confirm supply of "Foam Tender" from Fabricator /Assembler who meets the qualification criteria stipulated under clauses 2.1.1 & 2.1.2 above. Necessary documents as mentioned under clauses 2.1.1 & 2.1.2 above has to be submitted along with the bid.

2.2.2 In addition to 2.2.1, the bidder shall have the experience of successful execution of supply & commissioning of at least 1(one) number (additionally) Fire Water Tender/ Foam Tender as described under clause 2.1.2 in the last 05 (Five) years preceding the bid closing date of this tender.

2.2.3 Bidder shall enclose a Certificate in original in support of authorization of dealership/distributorship with back up Warranty & Guarantee from the "Fabricator / Assembler" to quote for this tender.

2.2.4 The bid shall be rejected in case of any change of the proposed "Fabricator / Assembler" after submission of the bid (except merger, takeover of the "Fabricator/ Assembler" Company etc.) by authorized dealer/distributor of the "Fabricator / Assembler".

3.0 The "Foam Tender" should be of "Right Hand Drive unit" (Steering on right hand side of unit). Left Hand Drive unit will not be acceptable.

4.0 The bidder shall quote the Engine power with emission norms - BS-III/BS-IV or equivalent.

The bidder shall have single point responsibility for complete package i.e. Foam Tender.

B) COMMERCIAL:

i) Bids are invited under "Single Stage Two Bid System". Bidders have to submit both the "Techno-commercial Unpriced Bids" and "Priced Bids" through electronic form in the OIL's e-Tender portal within the bid Closing date and time stipulated in the e-tender. The Techno-commercial Unpriced bid is to be submitted as per scope of works and Technical specification of the tender and the priced bid as per the Price Bid Format (XLS format) Copy of the same is attached. For details of submission procedure, please refer relevant para of General Terms and Conditions vide MM/CALCUTTA/E-01/2010 for E-Procurement LCB Tenders. Any offer not complying with the above shall be rejected straightway.

ii) Bidder must quote clearly and strictly in accordance with the price schedule outlined in Price Bid Format (XLS format) of bidding document; otherwise the bid will be summarily rejected.

ii) Bid security:

Bid security of **Rs. 367000.00** shall be submitted manually in sealed envelope superscribed with Tender no. and Bid Closing date to HEAD-CALCUTTA BRANCH, Oil India Limited, 4, India Exchange Place, Kolkata - 700001 on or before the Bid Closing Date and Time mentioned in the Tender. If bid security in ORIGINAL of above mentioned amount is not received within bid closing date and time, the bid submitted through electronic form will be rejected without any further consideration. For exemption for submission of Bid Security, please refer relevant Clause of General Terms and Conditions vide MM/CALCUTTA/E-01/2010 for E-Procurement LCB Tenders. **The Bid Security shall be valid for 10 months (date shall be put during tendering) from the date of bid opening.**

iii) Performance Security:

Successful bidder will be required to furnish a Performance Bank Guarantee @10% of the order value.

For exemption for submission of Performance Bank Guarantee, please refer relevant clause of General Terms and Conditions vide MM/CALCUTTA/E-01/2010 for E-Procurement LCB Tenders. The Performance Bank Guarantee for capital nature items like plant and machinery etc. shall be valid for 12 months from the date of commissioning or 18 months from the date of despatch whichever concludes earlier. However, for consumables like chemicals, cement, tubular etc. the Performance Bank Guarantee shall be valid for 12 months from the date of despatch.

iv) The Bank Guarantee should be allowed to be encashed at all branches within India.

v) Validity of the bid shall be minimum 120 days from the Bid Closing Date.
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vi) Bids received after the bid closing date and time will be rejected. Similarly, modifications to bids received after the bid closing date & time will not be considered.

viii) All the Bids must be Digitally Signed using "Class 3" digital certificate (e-commerce application) as per Indian IT Act obtained from the licensed Certifying Authorities operating under the Root Certifying Authority of India (RCAI), Controller of Certifying Authorities (CCA) of India. The bid signed using other than "Class 3" digital certificate, will be rejected.

ix) Technical RFx Response folder is meant for Technical bid only. Therefore, No price should be given in Technical RFx Response folder, otherwise the offer will be rejected.

x) Price bid should be submitted as per price bid format in notes and attachment (For details please refer tender cover letter or guideline for submission of tender).

xi) Attention of Bidders is drawn to the followings, which were specified in the Tender document:

a) Training charges, if any must be quoted separately on lumpsum basis. Training charges at OIL's premises should include amongst others to and fro fares, boarding/lodging, local transport at Duliajan and other expenses of supplier's training personnel during their stay at Duliajan, Assam (India). In case of training at Bidder's premises, to and fro fares, boarding/lodging and other enroute expenses of OIL's personnel shall be borne by OIL.

b) The to and fro fares, boarding/lodging and other enroute expenses of OIL's Engineers going for Pre-dispatch/Shipment Inspection shall be borne by OIL.

c) Stage-wise Third party inspection charges, if any must be quoted separately on lumpsum basis.

**xii) Integrity Pact:**

OIL shall be entering into an Integrity Pact with the bidders as per format enclosed vide Annexure V of the tender document. This Integrity Pact proforma has been duly signed digitally by OIL's competent signatory. The proforma has to be returned by the bidder (along with the technical bid) duly signed (digitally) by the same signatory who signed the bid, i.e., who is duly authorized to sign the bid. Any bid not accompanied by Integrity Pact Proforma duly signed (digitally) by the bidder shall be rejected straightway. Uploading the Integrity Pact with digital signature will be construed that all pages of the Integrity Pact has been signed by the bidder's authorized signatory who sign the Bid.

2.0 BID EVALUATION CRITERIA (BEC)

The bids conforming to the technical specifications, terms and conditions stipulated in the tender and considered to be responsive after subjecting to the Bid Rejection Criteria as well as verification of original of any or all documents/ documentary evidences pertaining to BRC will be considered for further evaluation as per the Bid Evaluation Criteria given below.

**A.. TECHNICAL**

i)To evaluate the inter-se-ranking of the offers, Assam Entry Tax on purchase value will be loaded as per prevailing Govt. of Assam guidelines as applicable on bid closing date. Bidders may check this with the appropriate authority while submitting their offer.

ii)To ascertain the substantial responsiveness of the bid OIL reserves the right to ask the bidder for clarification in respect of clauses covered under BRC also and such clarifications fulfilling the BRC clauses in toto must be received on or before the deadline given by the company, failing which the offer will be summarily rejected.

iii) Priced bids of only those bidders will be opened whose offers are found technically acceptable. The technically acceptable bidders will be informed before opening of the "priced bid".

**B:COMMERCIAL**

**i).** The prices offered will have to be firm through delivery and not subject to variation on any account. A bid submitted with an adjustable price will be treated as non-responsive and rejected.

**ii).** In the event of computational error between unit rate and total price, the unit rate as quoted by the bidder shall prevail.

**iii).** Similarly in the event of discrepancy between words and quoted figure, words will prevail.

**iv).** Evaluation will be done on 'total contract cost' basis to ascertain the lowest bid.

**4.0 Standard Notes:**

**1) The tender is invited under SINGLE STAGE-TWO BID SYSTEM. The bidder has to submit both the "TECHNICAL" and "COMMERCIAL" bid through electronic form in the OIL's e-Tender portal within the Bid Closing Date and Time stipulated in the e-Tender. The Technical Bid is to be submitted as per Scope of Work & Technical Specification of the tender and Commercial bid as per the Online Commercial Bid format.**

**2) In Technical Bid opening, only Technical Rfx Response will be opened. Therefore, the bidder should ensure that Technical bid is uploaded in the Technical Rfx response under Un-priced Bid Tab Page only. No price should be given in technical bid, otherwise the offer will be rejected. Please go through the help document in detail before uploading the document.**

3) The original bid security ( amount is mentioned above and also in Basic Data of the tender in OIL's e-portal) should reach us before bid closing date and time of the technical bid. **Bid without original Bid Security will be rejected**. The bidders who are exempted from submitting the Bid Bond should attach documentary evidence in the Collaboration folder as per clause 8.8 of General Terms and Conditions vide MM/CALCUTTA/E-01/2010 for E-Procurement LCB Tenders. **The Bid Security shall be valid for six months from the date of bid opening.**

4) **Offers should be valid for minimum 120 days from the date of Technical Bid closing Date, failing which offer shall be rejected.**

5**) Integrity Pact is applicable against this tender. Therefore, please attach the Integrity Pact document duly signed along with your quotation as per BRC**. The name of the OIL's Independent External Monitors at present are as under :

**(A) SHRI N. GOPALASWAMI, I.A.S ( Retd) ,**
**Former Chief Election Commissioner of India**
**E-mail Id : gopalaswamin@gmail.com**

**(B) SHRI RAMESH CHANDRA AGARWAL , IPS( Retd)**
**Former Director General of Police**
**E-mail Id : rcagarwal@rediffmail.com**

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