TECHNICAL SPECIFICATION FOR FOAM TENDER AS PER IS 10460-1983

1.0 GENERAL

1.1 The scope includes supply of chassis and fabrication of Foam tender for fire brigade use fully built with all accessories mentioned in the specification with other fittings and accessories. The Foam tender shall be fabricated on TATA Chassis model No. 1613/42 LPT / ASHOK LEYLAND 1616 / equivalent model of ISUZU / VOLVO complying with BS IV or latest emission standards at the time of delivery, Power Steering, Engine Exhaust Brake and cowl. The chassis shall meet the functional requirements of fire fighting operations. The foam tender shall be as per IS 10460 -1983 reaffirmed 2000 wherever further details specified.

1.2 The appliances shall incorporate a fire pump of 2250 LPM capacity, a Stainless Steel water tank of **4000 ltrs.** Capacity, a SS Foam Tank of **1000 Ltrs** capacity and connected equipment for foam production and also supplementary extinguishing agent (see appendices A & B).

1.3 The foam tender shall be fabricated in a manner so as to confirm to the following characteristics:

1.3.1 Gross vehicle weight not less than 15000 kg including crew, water and equipment. The gross vehicle weight is required to be increased proportionally upon chassis model.

1.3.2 Maximum speed on level road, full laden 72 KM/h.

1.3.3 Acceleration from a standing start through the gears, fully laden, 64 KM/h in 55 sec.

1.3.4 The appliances shall be capable of being started from rest on a gradient of 1 in 4.

1.3.5 When traveling at 48 KM /h. on a level dry surface the foot brake shall be capable of stopping the vehicles within a distance of 15 m from the point at which the brake is applied. The handbrake shall be capable of holding the fully laden appliance of a dry surface gradient of 1in 4 when in neutral gear.

1.3.6 Load of the vehicle should be distributed equally on all 06 wheels.

1.3.7 Tilt shall not be less than 25^0.

1.3.8 The appliance shall have the following overall dimensions:

Wheel base	:	Not more than 4500 mm
Turning Circle	:	Not more than 20 mtr.
Road clearance	:	Not less than 250 mm.
Overall width	:	Not more than 2.50 m

1.4 The appliance shall be capable of delivering not less than 2250LPM of water foam solution converted into foam through a combination of monitor and delivery lines and not less than 900 LPM of water foam solution converted into foam through the side lines alone when the monitor is not in use or not less than 900 LPM of water converted into foam through the monitor alone.

1.5 The monitor and the hand line should employ the self- aspirating type of foam production system where aeration is done at the branch pipe. The expansion ratio of the foam produced shall not be less than eight times with the use of the foam compound as prescribed in IS 4989-1974 to give the performance indicated above in point 1.4.

1.6 The foam induction may be automatic or manual, if one branch is in operation, all further addition and removal of branches shall automatically adjust the rate of foam compound induction within variation of 0.5 percent, the induction ratio not exceeding 6 percent.

1.7 A hose reel service shall be provided on the appliance in addition to water carried on it; it should also be possible to use water from a hydrant or water supply.

1.8 The supplementary agent used for the fire fighting shall be DCP.

1.9 The unit shall be designed to be as compact as possible, compatible with ease of accessibility to all service parts. The pump and foam making equipment controls shall be so arranged that one man can operate foam or water lines from the pump control panel.

1.10 Lever type valve controls shall be used. Nomenclature of all valve control shall provided

2.0 SCOPE

2.1 This specification lays down the requirements regarding material, design and construction, workmanship and finish, accessories and equipment of foam tender for fire brigade use including ***supply of chassis by the tenderer/supplier.***

2.2 The Fire tender shall also comply the design requirements indicated below.

3.0 DESIGN AND CONSTRUCTION

3.1 ENGINE

3.1.1 The engine shall be BS IV provided with cooling system to permit its continuous stationary running without overheating. Indirect cooling system shall be incorporated, which shall be of the open circuit type discharging water to the waste.

3.1.2 The operating temperature of the engine cooling water shall preferably be thermostatically controlled.

3.1.3 The oil in the oil sump shall be prevented from overheating.

3.1.4 Suitable gauge for cooling water and glow lamp for lubricating system shall be provided in the driver's cabin and on the pump panel. This shall be marked with operating temperature.

3.1.5 External filter shall be provided for the lubricating system and a tubular dipstick to gauge the level of oil in the oil sump shall be provided.

3.1.6 Electrical systems

3.1.7 A trickle type battery charger shall be provided for recharging the battery in situ. A red pilot lamp, indicating when the batteries are being charged from an external supply, shall be provided.

3.1.8 All important electrical circuits shall have separate fuses suitably indicated and shall be grouped into a common fuse box located in an accessible position in driver's cab and fitted with means for carrying spare fuses. The wiring shall be single pole and shall not be exposed to the atmosphere. Conduits shall be used wherever necessary.

3.2 WATER TANK

3.2.1 A water tank of not less than **4000 ltrs** capacity shall be mounted on the chassis. It shall be fabricated out of Stainless steel SS 304 sheet of minimum 3 mm thickness on sides and 4mm thickness at bottom and shall be suitably baffled to prevent surge when the vehicle is braking, accelerating or cornering. The baffle shall be arranged in a manner to facilitate the passage of a man throughout the tank for cleaning purposes. It shall be mounted on the chassis in a manner keeping in view of the proper load distribution on the axles and shall be so designed as to bring the center of gravity as low as possible in the chassis. It shall be rectangular in shape and the mounting of the tank shall be flexible type to prevent the tank's distortion due to the chassis flexion. The mounting shall permit full contents of the tank to flow into the pump. The tank with its fitments shall withstand hydrostatic pressure of 0.3 bars.

3.2.2 Suitable eyes shall be provided on the shell of the tank to enable the tank to be lifted off the vehicle for repairs or replacement as necessary.

3.2.3 The tank shall be fitted with two filling orifices, a drain cock, a manhole and a cleaning hole. The filling orifice shall be of not less than 250 mm diameter and shall be fitted with a manhole cover of 45 cm dia minimum and a filler cap clearly marked 'water' preferably cast in metal. In addition, two 63 mm instantaneous hydrant connection, incorporating with strainers, shall be provided close to the pump panel control for filling the tank through 75 mm diameter pipe or feeding the hose reel equipment. A 100 mm dia pipe line shall be taken from the tank to

the suction inlet of the pump incorporating a 100 mm quick action spherical type valve. Separate valve(s) for performing different functions shall be provided to control the flow of water. Drain plugs or cocks shall be provided wherever necessary. A cleaning hole of not less than 25 cm diameter shall be provided at the bottom of the tank and it shall be fitted with bolted cover. Two small aluminum ladders should be provided at the rear side of the water tank to climb to the top of the tank on either side, with two horizontal hand railings to enable the crew to stand and climb on the top of the tank.

3.2.4 The tank shall be fitted with a 50 mm diameter overflow pipe. The discharge ends of the overflow pipes shall be taken down to a point well below the chassis without reducing the effective ground clearance when fully loaded, and shall discharge away from the wheels.

3.2.5 Dial gauge water level indicator for the tank shall be provided preferably in the driver's cab and a visual level gauge of the glass tube shall be provided at the control panel calibrated 1/4, 1/2, 3/4 and full (preferably calibrated in liters).

3.2.6 The tank shall be connected to the pump and hose reel in such a manner that pressurization of water tank or water tank-pump connection is not possible when pumping water from an outside source of supply.

3.2.7 The plumbing between the pump and the hose reel shall have a clear and unobstructed water way of not less than 25 mm throughout without any obstruction.

3.3 **Foam Tank**

A foam tank of **1000 ltrs.** Capacity will be provided. The foam tank including sides, top, and baffles will be fabricated form 3.15 mm thick SS 304 Sheet. The tank will have a filling orifice of not less than 150 mm diameter with a removable strainer fitted to it. The strainer will be of such material which will not be affected by constant contact with foam compound and its total screening area will be adequate to permit quick filling of foam compound into the tank. The filler cap shall be clearly marked 'FOAM' preferably by pressing, casting or embossing. The tank shall have its top dished tunneling arrangement and a trough provided to enable easy filling from 30 litre drums. Suitable sharp-edged tin opener may also be provided at the foam tank filling mount for puncturing the foam compound drum for facilitating quick filling of the foam compound directly from the drums into the tank. The tank shall be suitably baffled to prevent surge while the vehicle is in motion or standing on uneven ground or brakes are applied to the moving appliance. The design of the tank shall incorporate a removable sump fitted with a drain valve. The foam compound draw off tube shall be positioned in the center of the sump in such a manner that foreign matter or sludge shall not pass into the compound line. The draw-off tube shall be fitted with a gauge strainer of suitable material, mesh, size, and adequate straining area. The tank top shall be removable and it shall be ensured that the joint between the top and the body of the tank is leak proof. Means shall be provided for automatic venting of the foams compound tank when the foam is being produced or the tank is being filled. This shall not be incorporated with the cap. The device employed shall be as simple as possible and shall not get clogged easily during normal use of the appliance. The draw-off tube shall be connected to the foam compound proportionator /inductor and pump, as necessary, and automatic flow control valve shall be incorporated in it so as to maintain a constant induction rate of not more than 6 percent with varying foam output The plumbing for this purpose shall have a clear and unobstructed passage of not less than 50 mm throughout and shall:

a) Be as short as possible
b) Be capable of being easily dismantled for internal cleaning.
c) Be provided with means of through flushing after use
d) Not form U bend or abrupt angle at any position and be capable of being drained easily without dismantling.
e) A suitable transfer pump shall be provided for transferring foam compound from drums to the foam compound tank without causing any frothing in the tank. Necessary connection shall also be provided for transferring the foam compound through this pump.

f) Provision shall also be made for drawing foam compound into the foam producing system from an external source through a pick-up tube while producing foam.

3.3.1 **BUILT IN FOAM PROPORTIONER**:

One manually operated selector type around the pump foam proportionator will be provided at the rear of the pump. The pump proportionator will induct foam compound and water proportionately to feed the foam monitor and two hand lines. The proportionator will be calibrated to ensure the correct intake of air foam liquid to foam equipment. This will have 5 different position selector valves i.e. 0,1,2,3 & 4 which engraved on brass plate.

3.3.2 **MONITOR ON TOP**:

One foam monitor of 7000 LPM aggregate foam discharge capacity will be provided on top of the tender in such manner that it can be operated manually by a member of fire crew. The monitor will be capable of traversing through 3600 in a horizontal plane. Elevating from horizontal to 450 and depressing from horizontal to not less than 150 and will be capable of projecting the foam discharge to an effective distance of not less than 35 meters in still air when operated at the designed pressure.

3.4 Water & Foam tanks shall be mounted on the vehicle on a sub frame. This sub frame shall be made from Hot dip Galvanized MS 4" Section and shall be bolted with the chassis using the high tensile bolts. No U-bolts shall be used on the vehicle. The tank shall be mounted on the vehicle using metacone mounting.

3.5 Electronic LED/Continuous level water and foam level transmitters for continuous level indication shall be on the control panel shall also be provided. The indicator shall sense the fluid level in the tank with help of a level sensing probe. The level indicators shall be suitable for any shapes of tanks. The level indicators would be self-calibrated and would not require any other type of calibration. The indicators shall have a viewing angle of 180 degrees. Remote secondary level indication in the cab shall also be provided. This will help the crew members and driver to check the fluid level from the cab while traveling.

3.6 **Hose Reel**

One hose reel (see IS : 884-1985*) shall be provided at the rear of the appliance with 60 m lengths of 20 mm bore hose connected by screw 'C' type quick release couplings and terminating with a control branch with 5 mm nozzle. The reel shall be fitted with over brake or locking device.

3.7 **Pump**

A Centrifugal pump (Fire fly/Godiva/Rosenberg/ Wadia/ UL listed make CE marked and conforming to EN -1028 Norms) shall be mounted at the rear of the appliance.

The pump may be single stage and fully auto reciprocating priming system/ water ring primer system. Anti-friction bearing external to the casing be provided so as to avoid any bearings within the pump casing. The pump shall be fitted with mechanical seal of self-adjusting type. The impeller should be dynamically balanced. A drain clock plug shall be provided at the bottom of the casing in such a way to prevent the cock being opened due to vibrations, stud etc, used in the pump casing shall be of stainless steel. In case, light alloy castings are used, those shall be of die-cast and without any blow holes, internal cracks etc. The interior of the casting shall be smooth finished. The castings shall withstand the Hydraulic pressure given.

The Pump capacity will be 2250 LPM at 7 Kg/Cm2. The suction inlet will be of round threaded type and 2 X 63 mm delivery outlets of suitable alloy material valves having female instantaneous coupling with butterfly valves. The Pump will be rear mounted for ensuring maximum hydraulic efficiency when working from open source of water.

3.8 **PRIMER**

Water ring type primer/reciprocating type primer capable of lifting water from 07 meter depth at the rate of 30 cm/sec will be provided. Exhaust gas ejector primer has to be provided as additional.

The primer shall be capable of lifting water at least 7.0m (measured from water level to the center of the pump) in not more than 24 seconds and shall be fully automatic. The allowance shall be 30 cm for every 300 m elevation above mean sea level and one percent for 2.5^0C rise in water temperature. The party shall specify the type of primer in their offer.

In the case of water ring type primer, means shall be provided to automatically disengage the primer when the pump is primed. Where required header tank complete with isolating valve enabling anti-freeze solution is to be used in the circuit where necessary. If the primer is of the reciprocating type, means shall be provided to automatically limit the speed of engine while the primer is engaged.

In case of water ring primer, the primer shall be constructed of phosphor bronze, shall have stainless steel shaft and shall be fitted with suitable lubricated bearing depending upon the type of primer.

In case of reciprocating type primer, the selection of materials shall be made with a view that no major part is required to be replaced in course of service and the material used for these parts shall be phosphor bronze and stainless steel depending upon their respective strength and use. The caps of primer and springs shall be properly secured. The prime lever shall be easily accessible from the operator's position.

In the case of reciprocating type, the primer shall be designed with a view to prime when the pump is running at speed of 1000 to 1500 rpm.

3.9 **COOLING SYSTEM**

Indirect cooling system of open circuit type consisting of special heat exchanger will be provided to the vehicle to enable full power output to be maintained during pumping duty without overheating and hot water is discharged to waste.

3.10 **PTO**

Full torque, drive line heavy duty PTO unit capable of transmitting full power of the engine to the pump will be provided. Lever of PTO will be provided in the driver's cabin. Hydraulically operated System may also be provided with the controlling switch in the driver's cabin. The make of the PTO shall be of TATA / VAS / SYALL make. Necessary support for PTO units, propeller shaft coupling, universal joints etc. shall be provided. The drive assembly component shall be dynamically balanced**.**

3.11 **CONTROL PANEL**

Adequately illuminated control panel shall be provided at the rear of the appliance. The control panel at the rear will include the following valves and controls. Pull type valves shall not be provided.

1. Tank to pump
2. Pump to hose reel
3. Pump to inter cooling
4. Pump to Foam monitor
5. Delivery outlets
6. Suction inlet
7. Hydrant connection
8. Flushing line
9. Compound gauge

10. Pressure gauge
11. Primer control lever
12. Throttle.
13. Temperature gauge
14 Water level indicator

Gauges fitted on rear control panel shall be digital /LED indicator .

3.12 **ELECTRICAL EQUIPMENT**

Adequate lighting arrangement shall be made in all compartments. All equipment lockers will have internal lighting arrangement preferably LEDs automatically switched on and off by opening/closing of doors. The entire wiring will be of concealed type. Search light shall be provided with Halogen lamps.

3.13 **WIND SCREEN**

Flat windscreen glasses will be provided for better visibility and windscreen wipers will be provided.

3.14 **STABILITY**

The stability of the appliance shall be such that when under fully equipped and loaded, if the surface on which the appliance stands is tilted to either side; the point at which overturning occurs, is not passed at an angle of 30^0 from the horizontal. It shall be demonstrated during final stage of inspection.

4.0 BODY WORK AND STOWAGE:

4.1 **DRIVER'S CABIN**: The driver's cabin will be round shaped closed type streamline in design with double compartment without partition and will provided accommodation for seven men. i.e. officer and driver in front two seats and crew of five firemen in the rear seat. The driver and officer will have independent seats and the seat for the crew will be one of full length. The driver's seat will be adjustable. The seat and backrest will have foam cushions and will be upholstered with Rexene. The construction of cabin and rear body will be of all steel nature. The cabin will be paneled externally with 1.60 mm aluminum sheet and internally with non-tear sheets. The four doors (Two on each side) will be fitted with safety glasses and winding type regulators. The foot rest provided shall be of minimum 14 cm width. One roof light will be provided in the driver's cab. Grab rails and non-slip steps will be provided wherever necessary. Extinguisher stand for minimum 04 extinguishers (For DCP 05kg, Mechanical foam 09 ltr.) shall be provided behind the Officer's seat inside the cabin. Clamps with support shall be provided for keeping 02 nos. of CO_2 4.5 Kg extinguisher at either the sides of the crew's seat inside the cabin. All the controlling switches shall be provided in front of the driver seat so that the driver can easily operate all the switches from driver seat.

4.2. **LOCKERS**: Lockers shall be provided for secure stowage of all equipment given in Appendix A & B. The height of the lockers from the bottom to the top of the opening shall be not less than 600 mm and the depth not less than 600 mm. The floor and all internal sides of the lockers will be covered with aluminum-chequered plate and will have sufficient protective edge to avoid gears falling out accidentally. All lockers shall be provided with internal automatic lighting arrangement with the master switch in the cab. The doors of the side lockers shall not be hinged at the bottom. Hose tunnels shall be provided to carry four 2.5 m lengths of suction hoses in convenient location. The tunnels should be sloped in such a way so that these allow the water or contents left in the hose after use to flow out.

4.3 **STRUCTURE AND PANELING**: The complete structure will be fabricated from 16 SWG MS pressed section duly treated for anti-corrosion. The interior paneling will be done from 18 SWG aluminum sheets and the exterior paneling will be done from 18 SWG aluminum Sheets.

The entire roof of the vehicle, entire rear, cabin floor and sides locker floor and sides will be covered with aluminum chequerred plates.

4.4 **LADDERS GALLOWS**: Gallows to carry 10.5 aluminum extension ladder will be provided with rollers so that it can be operated easily and instantly by one man. Arrangement will be made for locking the ladder when stowed.

4.5 **ADDITIONAL CREW ACCOMMODATION**: Standing accommodation will be provided for firemen with strong grab rails and support at the rear of the appliance.

4.6 **MATERIAL SELECTION AND TREATMENT**

4.6.1 The choice of materials to be used for the construction of the appliance shall be made with a view to combine lightness with strength and durability.

4.6.2 Timber shall not be used in body construction.

4.6.3 The appliance is intended for use in tropical conditions with constant high humidity and heat. This shall be given full consideration while selecting the materials and, for this reason, use of rubber or other similar materials shall be avoided as far as possible. When it is unavoidable, the parts made out of these materials shall be easily replaceable and shall be easily available.

4.6.4 All parts which form waterways or come into contact with foam solution shall be of corrosion resisting materials or suitably treated with corrosion resistant compound. All metal parts exposed to atmosphere shall either be of corrosion resisting material or treated suitably to resist corrosion.

4.6.5 Ferrous metal shall not be used for chromium plated fittings and the plating of all such fittings shall be of proper quality.

4.6.6 Lubricating nipples shall be provided wherever necessary.

5. ACCESSORIES:

5.1. Electrical Fittings:

1.	Fog Lamps	:	02 Nos.
2.	Reversing light with hooter/ reversing horn/buzzer	:	01 Nos.
3.	Amber blinker light on the driver's cabin	:	01 No.
4.	Blinker type trafficators on the rear & front side	:	01 No.
5.	Wind screen wiper	:	01 No.
6.	Revolving light (Light bar)	:	01 No.
7.	Dash board along with 3 pin plug point connected with battery back-up.	:	01 No.

5.2. OTHER ACCESSORIES:

1.	Fixed type searchlight having 30 mtrs of cable, cable reel and tripped	:	01 No.
2.	Portable inspection lamp with bracket to be clamped to Battery.	:	01 No.
3.	Spot light, adjustable type to be mounted on the appliance at convenient position.	:	01 No.
4.	Electrically operated siren (additional switch for operation to be provided near the officer's seat)	:	01 No.
5.	Trickle charger having capacity of 250 volts having capacity to charge 12 V battery along with pilot lamp to indicate whether the battery is being charged. This is required to be fitted at appropriate location on the foam tender.	:	01 No.
6.	Stowage lights, pump panel lights and lights where pump and primer are mounted stowage light shall be auto/off type.	:	As required
7.	Hand operated 250 mm fire bell chromium plated to be fitted at suitable place in the crew cabin. IS: 928-1984	:	01 No.

8. Removable spark arrester fitted to the exhaust pipe of the Engine. : 01 No.
9. Wireless set Model: Motorola GM 338 or any other equivalent make /model complete with microphone, antenna and other accessories to be fitted in fire tender. Frequency :- 29.7 36 M Hz, 36-42 MHz, 42-50 MHz, 136-174 MHz, 403-470 MHz, 450-527 MHz(1- 25 W) Channels :-128.
10. Charging point for GPS system / mobile system shall be provided in the cabin.
11. Glasses: All glasses fixed should be superior quality. All the glass shall be toughened safety glasses with stone guards.
12. Towing hook should be provided in front side and rear side of the vehicle.
13. The supplier shall give his acceptance for support services with spares after supply for minimum period of 5years.

6.0. TWO TONE HOOTER WITH PUBLIC ADDRESS SYSTEM:

Public Address System: Latest type GRAND/AHUJA make light bar with two tone hooter/mike system with amplifiers & microphone shall be provided in front of Officer Seat in driver's cabin in a box. The model will incorporate 4 Nos. of halogen lights and 4 nos. of strobe lights. The model will be VENUSVOICE and will be of a minimum capacity of 75 watts and wire guard also shall be provided to safe the Grand make light bar.

7.0. PAINTING & MARKING

The appliances shall be spray painted in 'FIRE RED' with monogram and letterings in gold on both sides of the appliances as per IS: 5 -1978 shade no. 536 with double coat of good quality i.e. Asian Paint/Nerolac Paint/Berger/ICI etc., after fabrication. The underside of vehicle and chassis shall be painted black. Each appliance shall be clearly and permanently marked with the following information;

a) Manufactures name and trademark.
b) Year of manufacture
c) Capacity of the pump in lit/min and water tank& foam tank in liters.
d) Emboss the name and emblem of both BHEL and CISF on either side of the vehicle. The emblem of CISF and BHEL shall be provided to the party after placing the P.O.

BHEL EMBLEM

FOAM TENDER

CISF FIRE SERVICE
BHEL® HYDERABAD

CISF EMBLEM

13.0 INSTRUCTION BOOK, ACCESSORIES AND EQUIPMENT

Instruction Book or Books- Instruction book(s) for the guidance of the user (s), including both operating an normal maintenance procedure shall be supplied. The book(s) shall include an itemized and illustrated spare- parts list giving reference numbers of all the wearing parts.

9.0 SPECIAL NOTE

01. Vendors have to submit QAP.
02. The Vendors shall declare the material used in the construction.
03. They shall mention the relevant/governing I.S. specification/ International standard of material of the tender and accessories given in Appendix 'A'.
04. Corrosion resistance treatment shall be applied where ever required.
05. Vehicles shall conform to the prevailing Motor Vehicle Act & Rules.

06. The party shall give para wise confirmation of technical specification.

14. INSPECTION: 3 stage inspection/test of the above Foam Tender shall be carried out at the supplier site by our inspecting officials.

1ST STAGE: Preliminary inspection covering inspection of Chassis and Construction of understructure, Tank& Vessel Sheet Thickness Measuring. Hydraulic testing of Water Tank and foam tank. Welding should be carried out by qualified welder. All welding joints are to be tested by D.P.Test.

2ND STAGE: Fitment of the PTO & Pumps, placement of the HP Tested Water & Foam tank Hydraulic Testing of pipeline and Valve, paneling of sheets, fittings Lockers & drawer, Fitment of cooling bypass valve and pipeline leading to heat exchanger and suitable connection for its outlet, preliminary test of pump, working of PTO, operation of Exhaust Ejector primer etc while checking all relevant parameters.

3RD STAGE: In final stage, performance verification of all other normal items of equipment, fitments, appurtenances, light, fog lamps, search light, revolving blinker, spot light, rear warning lighting as per specified standard system & will carried out. Suction Test to be carried out with new Suction hoses supplied/provided with new Fire Tender. Following **"Acceptance Test"** on various equipment shall be conducted to meet Parameters.

01. Endurance Test of Centrifugal Pump.
02. Gradient Test.
03. Stability Test: The stability of the appliance will be such that when under fully equipped& laden condition, if the surface on which the appliance stand it titled to either side, the point at which over turning occurs is not passed at an angle of 27^{o} from horizontal. This Stability Test will be carried out on a Mechanical Tilt Platform & not missionary ramp. For carrying out this test, the bidder should necessarily have Mechanical tilt platform facility at their own manufacturing Unit. The rating of pump would be minimum 4 hrs. The priming will be tested as per standards. All the Water piping will be subjected to hydraulic test pressure of $15Kg/cm^2$ for a period of minimum 10 minutes.

04. Hydraulic Pressure Test of Tanks & High Pressure Piping.
05. Vacuum Test.
06. Monitor Throw Test.
07. Deep Lift Test.

11. **DOCUMENTATION: -**

a) Manufacturer's test certificate
b) Material certificate
c) Import papers for PTO
d) CCE Certificate for gas cylinders
e) Guarantee cards for bought out equipment's& accessories
f) Warranty certificate for Three years.
g) Manuals.

12. EQUIPMENT AND ACCESSORIES AS PER APPENDIX 'A'

APPENDIX-"A"

SCHEDULE OF EQUIPMENTS TO BE SUPPLIED (STOWED IN LOCKERS) BY THE SUPPLIER ALONG WITH FOAM TENDER

Sl.No.	Item	Qty
01.	Alloy Aluminium extension ladder -10.5m as per IS:4571-1977	01 No.
02.	a)ISI Marked Delivery hose according to Type B of IS: 636 in 15 m lengths fitted with 63mm delivery hose instantaneous couplings made of Gun metal and binded by copper wires.(see IS:903)	20 Nos.
03.	b) Hose bandages according to IS:5612 (part II) c) Hose straps d) Hose ramp made of rubber e) Vehicle stopper made of MS	12 Nos. 12 Nos. 04 Nos. 02 Nos.
04.	Suction hose of rubber of 100 mm internal diameter in 2.5 m lengths according to IS : 2410-1963 fitted with 140 mm suction hose couplings made of Gun metal and binded using copper wires according IS : 902-1974	04 Nos
05.	Three way suction collecting head with 100 mm suction coupling according to IS: 904	01 No
06.	Suction wrenches for 100 mm suction coupling according to IS:4643	02 pair
07.	Suction strainer 100 mm size according to IS:907	01Nos.
08.	Basket strainer cylindrical type according to IS :3582	02 Nos.
09.	Dividing breeching with control instantaneous pattern 63mm according to IS : 5131	02Nos.
10.	Collecting breaching instantaneous pattern 63 mm according to IS :905	02Nos.
12.	Combined key for hydrant, hydrant cover and lower valve according to IS:910	01 set
14.	Hand controlled branch for 63 mm size hose coupling/ Neulite branch	02 Nos.
15.	Branch pipe, universal according to IS:2871	02 Nos.
16.	Branch with revolving head according to IS:906	02 Nos.
17.	Adaptor double male instantaneous pattern 63 mm	02 Nos
18.	Dragon search light	02 No.
20.	Flameproof lamp (usable in the presence of inflammable gases or vapors)	02 Nos.
21.	Self-contained breathing apparatus with carbon composite (not SS) cylinders (compressed air type) complete with spare cylinder and tool kit fully conforming to EN-137. The BA shall be of MSA/Drager/AUER make. The cylinder shall be of 06 lit water capacity with free air filling capacity of 1800 liters with 300 bar filling pressure. The BA set shall also contain DSU and electronic signaling and warning unit with digital ambient temperature indicator.	02 sets

22	Foam making branch FMB-5X with pick up tube according to IS :2097	02 Nos.
23	Foam making branch FMB-10X according to IS :2097	02 Nos
24.	Lowering line– Hawser laid Manila rope, 50 mm circumference, 40 m long according to IS : 1084	01 length
25.	Long line – Hawser laid Manila rope, 50 mm circumference, 30 m long according to IS : 1084	01 length
26	Short line – Hawser laid Manila rope, 50 mm circumference, 15 m long according to IS : 1084	01 length
27.	Stretcher folding type conforming to IS: 4037 with three straps for holding the casualty in position.	02 Nos.
28	First aid box for 10 persons	01 No
29.	Rubber gloves according to IS; 4770	06 pairs
30.	Asbestos gauntlets	01 pair
31.	Axe, large according to IS : 703	01 No
32.	Spade	02No
33.	Pipe wrench-12 inch	01Nos
34	Pick axe according to IS:273	01 No
35	Crow bar according to IS :704	01 No
36	Sledge hammer, 6.5 kg according to IS: 841	01 No
37	Carpenter's saw, 60cm with handle according to IS: 5098	01No
38	Spanner, adjustable, 30 cm long handle according to IS:6149	01 No
39	Door breaker	01 No
40	Hydraulic jack 15 tones	01 No
41	Fire hook according to IS :927	01 No.
42	Tool kit set with box	01 No
43	Grease gun	01 No
44	Oil feeder	01 No
45	Gumboots preferably Duck pack make	06 pairs
46	Funnel for oil or fuel filling	01 No
47	Bolt cutter	01 No
48	Sheet cutter	01 No
49	Fire proximity suit Nomex 03 layered complete as per the following specification. a) Fire proximity suit made of DUPONT NOMEX fabric with coat, pant, gloves, hood, fireman helmet and boots. b) Outer layer made of Nomex Delta T (Tough) fabric of 200g/m^2 middle layer (Moisture barrier) made out of GORE-TEX Fire blocker N (140g/ m^2) c) Nomex threads for stitching the suit. d) Scotchlite/03M flame resistant in lime green. Silver reflective tapers must have been used. e) Suit to be approved & CE marked to EN 469 f) Balaclavas Nomex knitted sock hood made of Nomex Delta c duly CE marked to EN 531 g) Nomex knitted gloves must be CE marked to EN 659:2004, 420 & 388 h) Fire man helmat must have the neck curtain made of aluminized material with woolen padding (Helmet indigenous) i) Harvik make model 9687 fire boot with Kevlar/nomex leg lining CE marked to EN-345 Part-II	01 No

A P P E N D I X – "B"

SUPPLEMENTARY EXTINGUISHING AGENT DETAILS OF DRY CHEMICAL POWDER

1. The total quantity of supplementary agent shall be not less than 150 kg of dry powder and shall conform to IS: 4308- 1982. The dry powder system shall comply with the following minimum requirements.

2. The dry powder system shall comprise of two self-contained units, each having a capacity of 75 kg of dry powder.

3. The expellant exploded for the dry powder units shall be CO_2. The capacity of the CO_2 cylinders employed for this purpose shall be adequate to ensure complete discharge of the dry powder contents at a rate of not less than 2.25 kg/s from each unit. A well-designed pressure control system shall be provided to regulate the pressure of CO_2 gas and maintain a constant powder discharge pressure throughout the operation of the unit.

4. The dry powder unit shall have a discharge outlet fitted with not less than 22 m of minimum 25 mm bore hose terminating in a trigger control shut-off nozzle, capable of producing either a straight jet or fan-spray pattern of discharge. The range of jet shall be not less than 12 m.

5. The hose and nozzle shall be stowed suitably in lockers on either side of the appliance to facilitate speedy run out on arrival at an accident.