Specifications of
Fire Safety Equipment
Appliances
Accessories

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Fire Extinguisher
Fire Tender
Fire Monitor
Fire Blanket
Fire Hydrant
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Specifications of Water Fire Tender
(As per guidelines of IS: 10460 & IS 10993 or latest IS)

1.0 Scope:

The Water Fire Tender including all accessories should be designed & manufactured as per BIS / ISI and sound engineering practice. All the equipments & accessories should be fixed on the appliance in a compact & neat manner & should be so placed that each part is easily & readily accessible for use and maintenance.

This specification covers the general requirements regarding materials performance and acceptance tests for Water Fire tender to be used for Fire Fighting. The scope of supply shall be inclusive of but not limited to the following:

1.1 Chassis having 16 tons GVW (BS III/applicable emission norms in that region) with power steering to be bought by vendor on behalf of GAIL (India) Ltd. Manufacturing of Chassis must be latest, not more than 06 months old from the date of PO.

1.2 A Multi pressure (normal & high) Centrifugal type pump of CE marked Firefly/Godiva/Rosenbauer make capable of delivering 3000 LPM @ 8.5 Kg/cm².

1.3 A Heavy duty full torque Power Take Off Unit of Martin Harper / Webster / VAS / Firefly MAKE capable of transmitting power for driving the Pump with above features.

1.4 A stainless steel (SS-316/316L- based on site requirement) Water tank of 6500 Itrs. Capacity.

1.5 A aqua monitor of not less than 2500 LPM @ 7.0 Kg/CM²

1.6 A first aid and high pressure Hose Reel of 60 Mtrs length.

1.7 A battery operated amplifier system, rear view camera with visual display in crew cabin to be provided.

1.8 Control panels.

1.9 Single compartment driver cabin of seating capacity six (02 front independent seats and 04 at rear bench type) with arrangement for keeping BA set, fireman suits and other tools in box, fixed/hinged lockers type arrangement.

1.10 15 nos. of synthetic hose (yellow/red colour) of 15 mtr. Length with SS couplings, type B, IS: 636 Marked as mentioned in Annexure A.

1.11 02 nos. light weight 6.8-6.9 L WC, 300 bar, Dragger/MSA/Scott/Honeywell make B.A Set, with 02 nos. spares cylinder as per EN 137: 2006 Type II as per attached specification in Annexure B.

1.12 Piping, necessary controls, hose lines and other accessories, Complete accessories as per ANNEXURE-A, & as per requirement listed in this tender document.

2.0 General:

2.1 The Water Fire Tender including all accessories shall be designed for oil and gas fire application and manufactured as per relevant Indian Standards and as per sound engineering practice. All valves shall be of lever operated ball valves type except of any other type of valves mentioned anywhere else in the specification.

2.2 The specification mentioned here under lays down the requirements regarding material, design, construction, workmanship and finish, accessories and acceptance test of Fire Tender.

2.3 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.

2.4 All material/equipment shall be BIS marked & where BIS is not specified / not available the material shall be of high quality from reputed manufacturer. The vendor shall be responsible for supplying all equipments/accessories and properly fixing them on the chassis as described in this specification. Other details & requirements which are not covered under this specification, but may be necessary to complete the Fire Tender and/or to fulfill the operation /performance requirement shall be provided by the vendor, who should be responsible for the design & construction of the complete appliance to the full satisfaction of the Owner (GAIL).
3.0 Chassis:

The Water Fire Tender shall be fabricated and built on TATA/Ashok Leyland/Man/Volvo/ Eicher/Bharat Benz chassis (BS III/applicable emission norms in that region) with power steering, superstructure (fire tender) 16 Ton GVW (approx.) to be bought by the vendor on behalf of GAIL (India) Limited after placement of P.O. New chassis manufacturing recently (not more than six month old from the date of order) shall be used for fire tender fabrication. Offered chassis details to be submitted with bid.

3.1 The chassis shall be supplied with tool kit, spare wheel assembly with tyre (arrangement shall be made to fit on the tender), hydraulic jack etc.

3.2 All wiring shall be properly fixed in position and shall be protected against heat, oil and physical damage. All wiring shall pass through PVC sleeves/ conduits and to be distributed through distribution box. Lighting shall be provided for cabin, lockers, roofs, panels and other required area in addition to normal vehicle lighting. Wiring shall be colour coded or marked suitably at junction/terminator. Wiring shall be rated for more than 120 % of rated load and shall have minimum voltage drop/electrical losses. Circuit shall be suitably protected against overcurrent, overheat.

3.3 Extra Leaf springs (as per load) shall be provided at rear, if required.

3.4 All important electrical circuits shall have separate fuses suitably indicated and grouped in a common fuse box located in an easily accessible position in the driver cabin.

3.5 Drag hook or eye of adequate strength & design shall be provided at the rear & front of the chassis. One towing hitch shall be provided at rear portion for towing minimum one tonne trailer.

4.0 Pump:

4.1 The Water Tender shall be mounted with multi pressure (normal & high) centrifugal type pump of Firefly/GODIVA / Rosen Bauer make capable of delivering capable of delivering 3000 LPM @ 8.5 kg/cm2 approx. at 3 M lift & 300 LPM at 35 kg/cm2 approx. and should be powered through the chassis engine via PTO. The Heavy duty full torque PTO unit shall be capable of transmitting power to pump by suitable propeller shaft. Bidder shall specify the make, model of pump in the offer and send literature of pump with offer.

4.2 The suction side of the pump shall be able to connect directly to hydrant discharge outlets and also under pressure to the water tank of the tender.

4.3 The pump shall be rear mounted on the chassis and shall be accessible and readily removable for use, repair and maintenance. The pump shall have its control panel at rear.

4.4 The pump shall be of rigid construction and shall be made of Gun metal / light alloy, compatible with fire fighting water with stainless steel shaft suitable for use with saline water. The pump impeller shaft shall be carried in antifriction bearings.

4.5 The pump's impeller neck rings and impeller rings shall be renewable types and the gland shall be of self-adjusting type. A drain plug shall be provided at the bottom of the casing.

4.6 PRIMER: The pump shall be fitted with pump manufacturer primer. It shall be capable of lifting water at least through 7.0 meter at a rate not less than 30 cm/sec. It shall be of such design as would not lead to its mechanical failure, would be easy in maintenance and would work satisfactorily even if it has been left dry for a long period.

4.7 The delivery outlet of pump shall be connected to monitor and four numbers of screwed 63 mm delivery female outlets instantaneous type with blank caps at the rear side along with twist type lugs made of gun metal. The monitor outlets should be fitted with lever operated ball valves.

4.8 The pump shall have one suction inlet threaded type at rear side & should be provided with strainers which should be removable easily. The pump shall be able to take suction from the water tank in normal condition.

5.0 Power Take Off Unit (PTO):

5.1 The power take off unit of suitable gear ratio to match the engine & pump characteristics shall be provided.

5.2 PTO shall be operated pneumatically with push button/lever in crew cabin.

5.3 Necessary support for PTO units, propeller shaft couplings, universal joints etc shall be provided.

5.4 The drive assembly component (shaft, couplings) shall be dynamically balanced.
5.5 The details of the PTO such as its make, name of the manufacturer etc, supported with catalogue/ drawing shall be submitted along with the offer.

5.6 The PTO shall be Martin Harper / Webster / VAS / Firefly make and bidder shall specify make, model of PTO with offer and sent literature with the offer.

6.0 Water Tank:

6.1 Water tank of 6500 Litres capacity shall be suitably mounted on the chassis. It shall be fabricated out of SS 316/316L plates minimum 5mm thickness for bottom and remaining plates 4 mm thickness for sides & top and 3mm thickness for removable baffles. The tank should be of welded construction & should be suitably baffled. 100% radiography should be followed at butt joint and report shall be submitted during inspection and supply. The welding shall be done using GTAW with ER 316 electrode and DP shall be done at all fillet joints. The tank should have adequate SS angle reinforcement.

6.2 It shall be provided with baffles across with 450 mm manhole flange to prevent surge while the vehicle is accelerating, cornering and braking and shall be so designed and mounted as to bring the centre of gravity as low as possible in the chassis. The baffles shall be arranged in a manner to facilitate the passage of a man throughout the Tank for cleaning purposes.

6.3 The tank shall be rectangular / elliptical in shape, corrugated sheet type from sides for better strength and maximising space availability and mounted on chassis. It shall be flexible type to prevent the tanks distortion due to the chassis flexion. The mounting shall permit full contents of the tank to flow into the pump. The tank shall be mounted on the vehicle on a sub-frame. This sub-frame shall be made from anti-corrosive treated MS section and shall be bolted with the chassis using the high tensile bolts.

6.4 An inspection manhole of not less than 450 mm size shall be provided on top with hinged or removable cover and shall be marked ‘WATER’.

6.5 Suitable eyes shall be provided on the shell of the tank to enable it to be lifted off the vehicle for repair /replacement as necessary.

6.6 A cleaning hole of 250 mm diameter shall be provided at the bottom of the tank. The cleaning hole shall be provided with a 25 mm dia. drain pipe with a valve and plug connection and shall be taken down to a point well below the chassis without reducing the effective ground clearance.

6.7 The tank shall be fitted with min. 50mm. bore overflow pipes and the discharge end shall be taken below the chassis without reducing the effective ground clearance.

6.8 Tank should have following connections to facilitate the operation:

6.8.1 Hydrant – Tank (01 number on both sides).

6.8.2 Tank – Pump– Hose reels (high pressure).

6.8.3 Tank–Pump– 4 nos. deliveries.

6.8.4 Tank – Pump– Monitor(Aqua monitor)

6.8.5 Hydrant to Hose Reel (normal pressure)

6.8.6 Pump delivery to PTO, engine radiator cooling tank and back to pump suction.

6.9 The filling connections in the tank shall be suitable dia. and shall be fitted with 63mm inst. Male connections of SS with removable strainer & blank cap & NRV.

6.10 The tank shall be connected to the pump with a ball valve.

6.11 A water level indicator (graduated glass tube) with isolation valve shall be provided close to the pump control panel indicating Full, ¾, ½, ¼ & empty. In addition to this an electronic/digital water tank level indicator meter shall be provided at pump panel and crew cabin. It shall be suitably illuminated, calibrated and marked.

6.12 The complete tank shall be painted with epoxy paint after thorough cleaning & surface preparation, both internally and externally after fabrication to protect against corrosion. Suitable anticorrosion treatment shall be done internally and externally of tank.

6.13 The engineering of the tank should be of good quality so as to increase the life of the tank and should be of least maintenance. The tank shall be embossed with Die Pressed stiffeners on all four sides to prevent the surges while
the vehicle is accelerating, cornering and braking and shall be so designed and mounted as to bring the centre of gravity as low as possible in the chassis.

6.14 The tank should have provision to avoid vacuum and overpressure.
6.15 Apart from the above, all facility shall be as per IS: 10460 for water tank.
6.16 Material test certificate for tank material and all other relevant test certificates shall be submitted along with fire tender.

7.0 Aqua Monitor

7.1 There shall be one number of Aqua Monitor of 2500 LPM @ 7 Kg/cm². It shall be made of SS 316 with bronze bearing/worm. It shall be provided with drain valve. Make, model & literature of offered monitor to be submitted with offer.
7.2 The monitor shall be connected through pipeline to the discharge outlet of the pump and provided with ball valve near monitor.
7.3 The monitor shall be lever operated and shall be capable of traversing through 360 degree in a horizontal plane, +45 degree & above up and -15 degree down in the vertical plane.
7.4 The horizontal throw range of water at 7 Kg/cm² pressure shall not be less than 50 and 45 mtr respectively in still air.
7.5 The monitor nozzle shall have a variation for fog pattern application, and shall design / manufacture in such a way that jet & spray shall create wind velocity in favourable wind direction.
7.6 A suitable place shall be provided for the operator to stand and operate the monitor comfortably in any direction.

8.0 Water Hose Reels:

8.1 The high pressure pump should operate through a separate hose reel of 60m length which should be provided at a suitable place on the appliance. The hose used for the hose reel shall be rated for 150 bar working pressure (200 bar test pressure) & should be of 16-19 mm ID. It shall have geared winding system. At the discharge end of the hose reel, a high-pressure fog guns capable of discharging 300 LPM @ 35 bars in jet or fog patterns, as required shall be connected. The jet range should not be less than 20 Mtrs. & the water droplets in the spray form should be of approximately 300 microns at an angle of 45 degrees.
8.2 An additional 60 M first aid hose reel (braided non kinking hose IS marked) operating at normal pump pressure shall be provided along with hydrant to hose reel, pump to hose reel connection. It shall have gear operated winding system.

9.0 Cooling System (Engine and PTO)

9.1 A suitable capacity additional heat exchanger for cooling of engine coolant shall be provided. The water cooling system for PTO oil and Engine coolant heat exchanger shall be directly connected to pump discharge side.
9.2 The cooling system shall be of closed circuit type i.e. cooling water should go back to pump. It shall provide adequate cooling to PTO and engine for high efficiency during stationery and prolonged operation of fire tender. Lever operated ball valves shall be provided for cooling line flow control and draining hot water at engine coolant heat exchanger.
9.3 The heat exchanger (PTO and cooling tank for Engine Coolant) piping shall be of copper for effective cooling.
9.4 A set (02 nos, each) of flexible hoses and clamps connecting engine radiator to heat exchanger shall be supplied with fire tender.

10.0 Pipings

10.1 All piping should be sized so as to have minimum pressure drop and achieve the required pressure and flow at various locations.
10.2 All pipe fittings and valves should be SS 316 or cast equivalent.
10.3 All piping should be seamless and designed for 10% over the maximum pressures encountered in the pipe.
10.4 The piping should be flanged for ease of maintenance. However, flange joins kept minimum.
10.5 All lines should be hydraulically tested at 1.5 times the design pressure However, in no case should the lines be
10.6 All lines should be suitably supported so as to provide rigidity and avoid vibrations.

10.7 All lines less than 1.5" NB size can be socket welded to matching pipe rating fittings. All lines above 2" NB size should be butt welded with full penetration welds.

10.8 All bolting should be of SS-316 or cast equivalent.

10.9 100% radiography shall be done for butt welded joints of piping. Documents shall be submitted along with appliance.

11.0 Body Work:

11.1 Enclosed accommodation shall be provided for two men in front portion of compartment including driver. Both the seats shall be independent. The driver’s seat shall be adjustable type. The rear area of compartment of driver’s cabin shall have one fixed seat for full width of cabin for crew members with back rest. Provision for fixing of PA system/base shall be in crew cabin. All seats shall have foam cushions and shall be covered with good quality Rexene. Door on either side shall be fitted with safety glasses (splinter proof) and winding type regulators. Door locking arrangement with single key operation shall be provided. The cabin floor shall be provided with 6mm rubber mating. One roof light shall be provided in the driver’s cabin. Dual sun visors and long arm outside fitting rear view mirror shall be fitted to the cab. 02 nos. wall mounted portable fans shall be provided/ fitted for officer seat and driver seat. The front glass of cabin shall be single piece.

11.2 In cabin the rear removable but hinged and secured seat with good support shall have box type arrangement to accommodate battery in enclosed box, tool box, and other important equipments. Six numbers of hooks shall be provided above the rear seat at suitable height for hanging fireman suit/helmets. Arrangement to stow the two no. light weight (MOC: carbon composite) BA sets with spare cylinders in the recessed back rest of the crew member seats shall be provided with good quality snap belt fasteners in without hampering free movement in cabin and shall have easy donning facility of BA sets. Grab bar to be provided in centre of cabin for rear seat users. The seats shall be provided with seat belts.

11.3 Battery shall be placed in totally enclosed box with sealed gland for cable entry.

11.4 Installed battery of chassis shall have a charging facility from external source at its location itself.

11.5 Fabricator shall ensure that the power distribution is sufficient for all electrical equipments/devices to be used at a time. Extra battery backup may be provided if required.

11.6 Provision shall be made on dashboard for installation of VHF set with separate power supply. Supply of VHF set is not the scope of vendor.

11.7 The entire structure of the Fire Tender including that of driver’s cabin shall be a welded structure made from MS pressed sections and channels with thick aluminium sheet panelling outside. The cross members and supports channels shall be electroplated/hot dip galvanised. Fabrication shall confirm to Motor Vehicles Act & BIS. Shutter space below chassis shall be fully utilised. The pump system to be covered with adequate sized shutters. Sufficient protection should also be given to these systems from under chassis side.

11.8 All lockers above chassis shall have Anodized Aluminium (MCD France or Fireco Italy make or equivalent) rolling type shutters. A suitable space shall be provided to keep 15 lengths of 63mm size fire hose each of 15 m length sufficient number of lockers for storage of equipments shall be provided with external access and at such height of about 1.67 mtrs. So as to be accessible from ground level. The top of lockers shall have roof, thereby providing a working platform for access to tank tops and also the roof mounted monitors. The bottom of all the lockers should be of chequered aluminium plate of 4mm thickness fitted on the base frame to avoid bending of the plate.

11.9 All the lockers shall be fitted with internal lighting with suitably located ‘ON/OFF’ switch. A master switch for isolating the locker lighting circuit shall also be fitted in the driver’s cab.

11.10 All the lockers shall have snap coupling belt fasteners to keep equipments in its place and order.

11.11 All the lockers shall have self-drainage of all wash down water.

11.12 Grab rails (Double) and non-slip step of heavy chequered plate shall be provided to give access on both sides to the roof of the appliance and for easy and speedy removal and mounting of ladder.

11.13 A GRAND/reputed BRAND make battery operated Multitone hooters/mike with amplifier & flashing light BEACON system shall be provided. Microphone shall be provided in the driver’s cabin. One loud speaker with standard
make hooters like HWOTONE hooters shall be mounted on the driver’s cabin roof. Amplifiers and microphone shall be provided in front of officer’s seat in sealed box. Light bar shall have at least three lights on each side and shall have sound range of 1 Km.. It shall be protected by wire mesh.

11.14 Ladder gallows of roller type shall be provided on the roof of the vehicle for easy placing/removal of 10.5 m aluminium extension ladder. There shall be suitable gallows fitted with rollers and designed to facilitate easy & quick removal of the ladder by one man from the rear of the appliance.

11.15 All electrical system including that of the chassis must be through conduits and terminals in weather proof junction box. Battery cut off switch should be provided inside cabin. All electrical circuits shall have separate fuses suitably marked and grouped in a common fuse located in an easily accessible position. Provision shall be made for minimum 04 spare fuses in the box provided in cabin. Layout drawing of entire electrical wiring shall be submitted along with fire tender.

11.16 The entire structure of appliance including that of drivers cabin shall be welded structure made from anticorrosion treated made of 14 SWG MS pressed section and channels structural steel (IS 2062) with minimum 16 SWG aluminium panelling. Complete flooring shall be of 16 SWG aluminium chequered plate. The cross members and supported channels should be zinc electroplated 50 microns for the channels and 20 microns for supports.

11.17 The control panel of water operation shall be done on aluminium sheets of 16 SWG/2 mm.

11.18 The vehicle shall be covered from Top with 3 mm chequered plate having rainwater channel at both side. The openings for equipment shall be sealed properly to ensure no water goes inside. Lockers, roof joints shall be sealed properly to avoid water ingress and corrosion.

11.19 The complete vehicle including the chassis shall be coated with best quality anti corrosive treatment/paint.

11.20 Strong grab rails shall be provided at the rear of vessel for access to top of vehicle and foot bards shall be covered with 3 mm aluminium chequered plates.

11.21 No part of bodywork shall reduce road clearance to less than 36 cm nor increase the overall width more than 2.50m.

11.22 All spares as per Annexure-A shall have proper place in the tender. These spares shall have firm fixing arrangement. Placement of spares shall not disturb while Tender is accelerating, braking or moving on the poor road conditions. All these spares shall be easily accessible and shall have arrangement to remove them easily.

12.0 Control Panel:

12.1 The appliance shall have control panel for water system operation. Panel for water system adequately illuminated shall be provided at rear side of appliance. All controls of the system shall be spaced properly and marked for easy operation. No valve shall be of wheel type.

12.2 All controls of the system shall be spaced properly and marked for easy operation. All valves shall be of lever operated type & shall be made of SS with Teflon seats.

12.3 Line diagram for Water system along with SOP shall be provided in rear of vehicle near rear pump operation panel/pump.

12.4 All other controls like electrical siren, PA system shall be provided at the driver’s cabin. All control panels shall have clearly written operating instruction plate. Adequately illuminated operating panels shall include the following:

a. Auxiliary throttle control for the engine.
b. Pump pressure gauge.
c. Hydrant connection for water tank filling pipes on either sides.
d. Delivery outlets of the pump along with the control levers and blank cap with chain.
e. Suction inlet of pump with blank cap & chain.
f. Electronic gauges for water level in addition to normal tube gauges.
g. Pump suction – water tank isolating valve control.
h. Water tank level indication of the graduated glass tube with isolating cock valve (suitable protected) type or
other suitable type shall be provided.
i. Lighting for control panel illumination.
j. Operating instruction plate.
k. Compound Gauge.
l. Valve for Hose reels.
m. Drain valves.
n. All pressure gauges shall be made of SS dial and needles to be immersed in fluid.

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.

12.5 The dashboard panel in the driver’s cabin should have: In addition to chassis manufacturer features following should be provided at dashboard.
a) Siren switch.
b) Water level electronic gauges (bar type). This is in addition to tube gauges provided at rear side of vehicle.
c) Rear view camera display screen.
d) PA system control panel.
e) Water system flow diagram.
f) PTO push button for engagement of PTO pneumatically. It should be labelled properly and protected with casing/box.
g) Master switch for batteries to be provided in driver cabin.

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.

13.0 Workmanship and Finish:

13.1 The standard of workmanship and finish of all mechanical and other parts should be such that the parts normally required to be replaced can be easily & conveniently replaced and fitted correctly.

13.2 Workmanship executed shall be of highest quality and order. All rivets & bolts shall have a coat of approved paint on both surfaces before riveting or bolting, welding. All steel screws, bolts, nuts. Studs, rivets etc. shall be zinc coated or shall have rust proof coats by a recognized process. All the material used material in the fabrication of the body work shall be of good quality or approved make and type. All equipment and material shall comply with the requirements of the latest relevant IS specifications.

13.3 All the lockers and rear pump compartment shall be covered with extruded aluminium roller shutter of reputed make of best quality. Roller shutter shall be water tight when closed. The roller shutter shall be durable, maintenance free, weather & corrosion resistant. Guide rail shall support the shutter over entire length. The extruded aluminium roller shutter shall be powder coated/anodized to a smooth finish and aesthetic view. The roller shutter shall have mechanism to hold the shutter in partly opened condition and should not free fall.

13.4 If required, lower lockers shall be provided with flap type doors opening downwards. Heavy duty chain and hinges shall be provided on these doors so that these doors can be used as climbing step for access to upper lockers. Adequate grab handles shall be provided in upper lockers at convenient height for easy access.

13.5 Arrangement for keeping 04 numbers suction hoses shall be provided with suitable supports at convenient location.

13.6 All the portable equipments over top of the vehicle shall be provided with suitable bag/cover for protection from rain dust etc.

13.7 The equipments shall be covered by aluminium panelling from outside.

13.8 The gross vehicle weight of the Fire Tender with all equipments, consumable & crew should be approximately 85% of permissible axle load of chassis manufacturer’s specification. The weight distribution diagram, equipment layout shall be submitted along with the offer.
14.0 Painting & Marking:

14.1 The entire appliance shall be painted in ‘Red’ IS: 5 SHADE NO: 536,0.12 to 0.2 mm thickness, using double coat spray painting on the outside. The paint shall conform to IS: 2932. The painting process shall be performed as: a) each primer capable of passivating the metal and ensuring adequate adhesion for subsequent coat to a dry film thickness (DFT) of 6 microns shall first be applied. b) Acrylic polyurethane based sealer / primer shall be applied to a DFT of 40 microns to guarantee and excellent gloss hold out, chip resistance and uniform base colour shall be the second coat. c) Top Coat- Two coats of lead free, chromate free acrylic polyurethane shall be applied providing excellent coverage and durability.

14.2 On either side of the Vehicle Logo of ‘GAIL’ and ‘GAIL (India) Limited’ monogram and “Water Tender” shall be affixed (radium/HDPE sticker) in contrast colour at suitable places bilingually.

14.3 The driver’s compartment shall be laminated and the inside of lockers shall be painted cream. Lockers shall be finished in shadow board painting to show the position of each pieces of equipment.

14.4 The chassis and wheel arches shall be painted black.

14.5 All the water piping shall be painted Red (fire red).

14.6 Two coats of anticorrosion paint and one zinc phosphate priming coat shall be applied before painting of Fire tender including chassis.

14.7 For, all water fittings like Branch Pipes etc. Quick Release type couplings are provided which enables the operator to locate the desired equipment instantly and thereby save valuable time at the time of fire. These Couplings also ensure that none of the items damage the internal paneling and thereby increase the life of the vehicle. Suitable clamps, brackets, holders etc. are provided for all other items.

14.8 Identification of each equipment placed in the Tender, shall be marked in a Brass/AL plate near the placement of the equipment.

14.9 The vehicle shall be clearly and permanently marked with the following, preferably on a metal plate attached in the driver’s cabin and also near pump operating control panels:
   a) Manufacturer’s name or trade mark.
   b) Year of Manufacture.
   c) Capacity of Pump in l/min., water tank in litres.
   d) Engine and chassis number.
   e) All instrument controls shall be identified with name plates.
   f) All hoses & valves inlet & outlet shall also be identified by suitable name plates.

15.0 Spares:

Following water system spares shall be provided along with fire tender:

a. Valve of all type / sizes = 02 nos. each
b. Cap along with stud-nut–bolts for manhole of water tank = 01 each.
c. Drain cap with nut-bolts of water tank = 02 each.
d. All type pressure gauge = 02 nos. for each type.
e. Landing valves (spare) = 04 nos.
f. All type spares of landing valve (gland nut, spindle, wheel, washer, chuck nut, nut & bolts, L V sheet, gasket) = 04 nos. each.
g. All size / type of NRV = 02 nos. each size/type.
h. Required spares for monitors = 02 nos. each.
i. Spares for water pump: mechanical seals, shaft sleeves, bearing, gaskets, glands and other consumables: 02 numbers/sets of each.
j. Two tool boxes as given in annexure-C.
16.0 Accessories:

The Water Fire Tender shall also be provided with the following accessories in addition to those normally fitted to the chassis. All the accessories shall be suitably fixed in position or shall be kept in lockers or other suitable place as on the tender. Electrical fittings shall be weather proof & equipment should be ISI marked.

16.1 Electrically operated siren - 01 No. 12 V with range 1km. to be mounted externally on Top. Make: Kheraj/Philips.

16.2 Fog lamps powered by the battery of the Vehicle, these shall be low mounted in front of the vehicle - 02 Nos.

16.3 Reversing lights - 04 Nos., suitably situated to assist reversing.

16.4 Blinker type traffic indicators - 02 Sets.

16.5 Twin colored revolving light with beacon on top& blinker light on rear side- 01 Set, cabin roof mounted (Lukas or some other standard make).

16.6 Good quality Search light with halogen bulb with 100 mtrs. length of cable having 100 watt luminescent with tripod etc. complete - 01 Set.

16.7 An adjustable spot light - 01 No.

16.8 Portable Inspection Lamp with brackets to be clamped to the battery-01 No.

16.9 All tools of standard make required for normal routine maintenance of the Fire Tender & Emergency Work (Carpenter, Electrical & Engg tools box), which are not included with the kit of the chassis – 01 complete Set each.

16.10 Removable CCOE/PESO Approved spark arrestor fitted to the exhaust of the engine - 01 no. CCOE Certificate required at the time of supply.

16.11 Wind screen wipers (Electrically operated of approved design) if not provided with the chassis.

16.12 Public address system : (Philips or Ahuja make) Battery operated with a control panel in driver’s cabin shall be provided. One loud speaker shall be mounted on driver’s cabin roof. The range shall be 1 KM in still air and 500 mtrs. in noisy areas.

List of Equipments as per ANNEXURE “A” attached with this specification and as per IS: 950 and other equipments confirming to specify respective IS shall be provided.

17.0 Acceptance Tests (Fire Tender):

Following tests shall be carried out before accepting the vehicle at manufacturer’s workshop / site to the complete satisfaction of owner’s inspector without any extra cost.

17.1 The design of the Tender shall be such that it should not affect the chassis characteristics as specified by the chassis manufacture such as speed, turning circle, acceleration, breaking efficiency with appliance fully loaded, etc.

17.2 The pump shall run for a continuous period of minimum 4 hours at the rated capacity mentioned earlier. During test the temp. of engine should not exceed the rated temp& that of lube oil 79 degrees C.

17.3 The priming device shall be tested with a vertical lift of 7.0 M measured from water level to the centre of suction eye of the pump at a rate of not less than 30cm/sec.

17.4 The monitor and hand lines, separately and in combination as mentioned earlier shall be tested for delivering water at their rated capacity and horizontal range a mentioned in this specification.

17.5 All the piping shall be tested to a hydrostatic test pressure of 18.0 Kg/cm2 for a min. period of 2 hrs.

17.6 Water tank shall be tested for leakage after fabrication before applying any paint. The tanks shall be kept full with water and shall be observed for 24 hrs for any leakage.

17.7 The stability of the appliance shall be such that when under fully equipped and laden condition, if the surface on which the appliance stands is tilted to either side, the point at which the overturning occurs is not passed at an angle of 27 ½” from horizontal.

17.8 Quality of material of vessel and thickness of vessel plate shall be inspected and stamped by a recognised third party, inspectors and shall be produced at the time of 2nd stage inspection.

17.9 Gradient of appliance shall be tested on the test ramp which has an angle/ rise slope of 1m in every 4m of
distance travelled.

18.0 Documents/Information Required From Vendors:

18.1 Bidder shall submit following with offer, Non submission of the same shall lead to Technical Rejection of the Offer:

18.1.1 The basic layout of the tender as per requirement (Indicative layout of Water Fire Tender is given in Annexure-E for illustration purpose).

18.1.2 Fire Tender test facilities at vendor site.

18.1.3 Individual flow diagram of Water system of Fire tender.

18.1.4 Load distribution calculation (laden & un-laden weight, total load on axle to be approximately 85% of the rated load capacity of axles).

18.1.5 Layout drawing showing the detailed engineering of Water tank as per our specifications listed in this tender.

18.1.6 Electric load calculation.

18.1.7 Documents required (with offer) as mentioned in the specification.

18.2 After award of order following documents are to be submitted before fabrication for approval of GAIL:

18.2.1 Detailed Flow diagram of the appliance (indicating pipe sizes).

18.2.2 Quality Assurance Plan.

18.2.3 Plan and elevation of the appliance showing various equipment.

18.2.4 Pump characteristics & performance curves with the pump working on hydrant & the Water tank, with manufacturer catalogues & model no. etc.

18.2.5 Line diagram showing all piping and valve etc.

18.2.6 Line diagram of all electrical circuits.

18.2.7 Catalogues & technical details for all major parts like Pump, PTO, Chassis, Hose reel, Monitor, BA set, valves and fittings, brought out items with model no. to be sent along with offer and supply.

18.2.8 All relevant test certificates and approval shall be submitted along with supply.

18.3 On placement of order, vendor shall submit the stage wise inspecting plan for approval of GAIL. Job shall be undertaken after receipt of approval from GAIL. Inspection will be carried out by GAIL/GAIL appointed TPI or both.

First stage : Inspection of chassis at vendor’s site. Construction of under-structure, Water Tank. Documents related to Quality of material of vessel / tanks and thickness of vessel plate / tanks, radiography inspected and stamped by recognised third party inspector shall be produced at the time of 2nd stage inspection.

Second stage : Placement of all tanks, fittings, lockers, pump, quality of fabrication, checking of anticorrosion 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.

18.4 Technical Documents to be supplied by bidder along with the appliance

18.4.1 Operation & maintenance manual along with parts list-Six sets.

18.4.2 All technical literature of major brought out items-Six sets.

18.4.3 Original/transparencies after incorporating the as built information shall be got signed by the GAIL Inspection engineer before submitting to GAIL for records-Six sets.

18.4.4 Final drawings as described in above-Six sets.

18.4.5 Import documents for imported equipments (if any)-Six sets.

18.4.6 ISI Mark Certificate and CCE approval certificate for Extinguisher, CO2 cylinders etc.-1 Copy Each.

18.4.7 Radiography & Test certificate of Water, pipe welding, safety valve etc.-1 Copy each.

18.4.8 Calibration certificate of pressure safety valve, pressure gauge.

18.4.9 Hydro test certificate of hose reels, hoses, piping & fittings etc.
18.4.10. All relevant test certificates of tanks as per QAP.
18.4.11. 02 sets of soft copies of all above mentioned documents shall be supplied in addition to hard copy.

18.5. Manufacturer’s Declaration For Tank:
Leakage if observed in the tank within 3 years of supply due to design / manufacturing / material defects shall be rectified by the supplier free of cost. The confirmation from bidder for the same shall be given in writing along with the bid and supply.

18.6. Insurance, Road Tax & Permanent Registration:
18.6.1. All the documents shall be prepared with beneficiary as GAIL (India) Ltd. Bidder shall arrange for all insurance liabilities, RTO documentation, statutory payment (road tax, registration, fitness, PUC etc.) at respective state RTO including transit period i.e. from the time of chassis is taken over by the bidder from /its Authorized Dealer for fabrication of Fire Tender complete in all respect till the time it is accepted by GAIL after delivery at Site.

18.6.2. For chassis, copy of all relevant documents e.g. insurance, registration, road tax payment and other RTO payment shall be handed over to GAIL site by bidder immediately after buying/taking over of chassis from /its Authorized Dealer.

18.6.3. The bidder has to submit the following documents at the time of delivery of vehicle with beneficiary as GAIL (India) Ltd. Bidder shall renew the documents to meet the validity period of the documents as required at its own cost.

   a. Transit insurance.
   b. Comprehensive Insurance Policy from recognized Insurance Agency of Fire Tender valid for the period of one year beyond the date of acceptance of vehicle at GAIL Site.
   c. Road Tax Payment to RTOs (Vehicle manufacturing state RTO and RTO of GAIL Site valid for the period of one year beyond the date of acceptance of vehicle at GAIL Site.
   d. Permanent registration certificate of Vehicle from GAIL site RTO shall be obtained by vendor.

19.0. Buyback of Old Fire Tender In Case of Replacement of Fire Tender As Per GAIL Policy

GAIL intent to buyback existing fire tender fabricated on chassis, model: Bidder may see the fire tender and fully evaluate the fire tender on its own before quoting the rate of new fire tender. Bidder is required to quote for new fire tender and is also required to take back the old fire tender, in its then state/condition, and manner as given below:

   a) Bidder shall not quote separate price for old fire tender.
   b) Bidder is required to quote the bid price after taking into account the value of old fire tender. The details of old fire tender are given in technical specification of tender (Annexure).
   c) All taxes, duties, documentation and other expenditure required and incurred in taking the buyback of old fire tender from GAIL, Site is in vendor’s scope. No invoice should be generated from GAIL; however the bidder shall pay all the taxes and duties as decided by the RTO.
   d) Bidder should not sell the old fire tender to any of the GAIL employees or his family member as per GAIL Rules.
## Annexure-A

### Schedule of Equipments to be Stowed in the Appliance

<table>
<thead>
<tr>
<th>SN</th>
<th>ITEM</th>
<th>QTY(NOS.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Delivery hose, non percolating flexible, yellow/red colour, ISI marked IS: 636, Type-B as per IS:636, 63mm dia and 15mtr. Length</td>
<td>15</td>
</tr>
<tr>
<td>2</td>
<td>Suction hose of PVC/Rubber 100 mm int. dia in 2.5 mt. length fitted with 100 mm Suction Hose Couplings (IS 902-1974 2ND Rev.)</td>
<td>04</td>
</tr>
<tr>
<td>3</td>
<td>Three Way Suction Collecting Head 100 mm Size (IS904-1965 2ND REV.)</td>
<td>01</td>
</tr>
<tr>
<td>4</td>
<td>Suction Wrenches for 100 mm Suction Couplings (IS 4643)</td>
<td>02</td>
</tr>
<tr>
<td>5</td>
<td>Suction Strainer 100 mm size (IS-907-1965)</td>
<td>01</td>
</tr>
<tr>
<td>6</td>
<td>Basket Strainer (Cylinder Type)(IS3582-1966)</td>
<td>01</td>
</tr>
<tr>
<td>7</td>
<td>Dividing Breaching with Control Inst. Pattern (IS5131)</td>
<td>01</td>
</tr>
<tr>
<td>8</td>
<td>Collecting Breaching Inst. pattern 63 mm.</td>
<td>01</td>
</tr>
<tr>
<td>9</td>
<td>Fog Nozzle with extension applicator with fog head</td>
<td>01</td>
</tr>
<tr>
<td>10</td>
<td>Inline foam inductor (225 lpm)</td>
<td>02</td>
</tr>
<tr>
<td>11</td>
<td>Akron / Elkart make Multi-gallonage, multipurpose firefighting nozzles of lightweight aluminum/pyrolight, 750 lpmor above flow with at least 4 flow setting from 300-750 lpmor upper range without shutoff. It shall have spinning teeth of hard plastic/SS 316, jet range: 35-40 m at 7 bar. It should have jet, spary/fog pattern and should be provided with shut off valve. It shall conform to NFPA-1964 or latest rev.</td>
<td>04</td>
</tr>
<tr>
<td>12</td>
<td>Gun metal Branch Pipe (IS-903-1975 2ND REV.), Water curtain (SS), TP branches, revolving branch (Al alloy/SS) (02 of each)</td>
<td>08</td>
</tr>
<tr>
<td>13</td>
<td>NRV Spanner (for NRV hydrant to tank water inlet)</td>
<td>02</td>
</tr>
<tr>
<td>14</td>
<td>Adaptor for 100 mm suction female screw coupling and 63 mm male instantaneous (As per IS903-1975 2ND Rev.)</td>
<td>02</td>
</tr>
<tr>
<td>15</td>
<td>Adaptor Double female Inst. Pattern 63 mm (As per IS903-1975 2ND Rev.)</td>
<td>02</td>
</tr>
<tr>
<td>16</td>
<td>Adaptor Double male Inst. Pattern 63 mm (As per IS903-1975 2ND Rev.)</td>
<td>02</td>
</tr>
<tr>
<td>17</td>
<td>Nozzle Spanners (IS:903-1975)</td>
<td>02</td>
</tr>
<tr>
<td>18</td>
<td>Fireman axe (as per IS)</td>
<td>01</td>
</tr>
<tr>
<td>19</td>
<td>Intrinsically safe torch (LED) Wolfite/Pelican with minimum 120 lumen, area classifications rating for Zone-0 application (IEC/ATEX/UL approved).</td>
<td>02</td>
</tr>
<tr>
<td>20</td>
<td>Intrinsically safety rechargeable hand lamp (LED) Wolfite/Pelican with minimum light output of 350 lumen, area classifications rating for Zone-1 application (IEC/ ATEX / UL approved).</td>
<td>02</td>
</tr>
<tr>
<td>21</td>
<td>Portable fire extinguisher DCP, 09 Kg SP type (ISI marked), ABC Type</td>
<td>02</td>
</tr>
<tr>
<td>22</td>
<td>Portable CO2 fire ext., 4.5 Kg.(ISI marked &amp; CCEO approved)</td>
<td>02</td>
</tr>
<tr>
<td>23</td>
<td>Foam making Branch FB-5 &amp; FB-10 with pick up tube (IS 2097)</td>
<td>02</td>
</tr>
<tr>
<td>24</td>
<td>Lowering line-50mm circumference hemp or terylene or PP, 40 m long Having 2 ends spliced in &amp; 01 end with a running Nose(IS 1084-1969)</td>
<td>01</td>
</tr>
<tr>
<td>25</td>
<td>Long line-50 mm circumference manila/PP-30 m long (IS1084-1969)</td>
<td>01</td>
</tr>
<tr>
<td>26</td>
<td>Short line-50 mm circumference manila/PP-15 m long(IS1084-1969)</td>
<td>01</td>
</tr>
<tr>
<td>27</td>
<td>First Aid Box for 10 person (Contents as per Factory Act)</td>
<td>01</td>
</tr>
<tr>
<td>28</td>
<td>Crow Bar (IS704-1968)</td>
<td>01</td>
</tr>
<tr>
<td>29</td>
<td>Sledge Hammer, 6.5 Kg (IS841-1968)</td>
<td>01</td>
</tr>
<tr>
<td>30</td>
<td>Spanner, adjustable, 30cm long handle (IS6169)</td>
<td>01</td>
</tr>
<tr>
<td>31</td>
<td>Door Breaker</td>
<td>01</td>
</tr>
<tr>
<td>32</td>
<td>Hydraulic Jack-7.5 tonnes (in addition to that provided with chassis kit)</td>
<td>01</td>
</tr>
<tr>
<td>33</td>
<td>Fire Hook (IS 927-1964)</td>
<td>01</td>
</tr>
<tr>
<td>34</td>
<td>Fire beater (IS 1931-1972)</td>
<td>04</td>
</tr>
<tr>
<td>35</td>
<td>Lock Cutter</td>
<td>02</td>
</tr>
<tr>
<td>36</td>
<td>BA set as per our enclosed specs. in annexure ‘B’</td>
<td>02</td>
</tr>
<tr>
<td>37</td>
<td>10.5 m Al, Extension Ladder as per IS-4571</td>
<td>01</td>
</tr>
</tbody>
</table>
38. LPG Tanker leakage handling kit of CCE approved vendor.

39. Water gel blanket / burn shield blanket CE marked, size: 6FTX5FT

40. Hose Ramp (hose ramp for 02 nos. 63 mm delivery hose) (1 set-02 nos.)

41. Tool kit as per enclosed specifications in Annexure 'C'

42. Non sparking tools (Beryllium free Aluminum Bronze alloy):
   • Brass Hammer, size: 02kg = 01 no.
   • Double open end Spanners (Size: 19x22, 24x27, 26x27, 30x32) = 02 no. each.
   • Hack saw blade (OAL – 300mm) = 05 nos.
   • Hack – saw Frame (OAL- 540mm) = 01 no.

Tools shall be of Mekaster / Snapon / Hindustan Everest / Hebei Boton or Equivalent make only

43. All the above items 1 to 40 should be confirming to relevant IS and as specified in relevant item description. All above said items shall be placed and fixed in vehicle with proper holders, clamps etc.

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**Annexure 'B'**

**Specifications of BA Set as per GAIL PPE specification**

*(site should add the specification of BA set)*

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**Annexure 'C'**

**Description of Ordinary Hand Tools**

<table>
<thead>
<tr>
<th>SN</th>
<th>DESCRIPTION OF MATERIAL (IN EACH TOOL BOX)</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Set of pipe wrench of sizes:- 8&quot;,10&quot;,12&quot;,14&quot;,18&quot;,24&quot;,36&quot;.</td>
<td>01 each</td>
</tr>
<tr>
<td>2.</td>
<td>Double open end spanner (set of 6 mm to 32 mm) 6x7, 8x9, 10x11, 12x13, 14x15, 16x17, 18x19, 20x22, 21x23, 22x24, 24x26, 24x27, 25x28, 30x32</td>
<td>01 Set</td>
</tr>
<tr>
<td>3.</td>
<td>Ring spanner set (06 mm to 32 mm) 6x7, 8x9, 10x11, 12x13, 14x15, 16x17, 18x19, 20x22, 21x23, 24x26, 24x27, 25x28, 30x32 (Total 13 Nos.)</td>
<td>01 Set</td>
</tr>
<tr>
<td>4.</td>
<td>Adjustable slide wrench (04 Nos.) (150 mm, 200, 250 mm &amp; 300 mm)</td>
<td>01 each</td>
</tr>
<tr>
<td>5.</td>
<td>Allen keys (in L' shape) &amp; (size in MM) 1.5, 2, 2.5, 3, 4, 5, 6, 7, 8, 9, 10 &amp; 12 (12 Nos.)</td>
<td>01 each</td>
</tr>
<tr>
<td>6.</td>
<td>Combination pliers (02 nos.) 150 mm &amp; 200 mm.</td>
<td>01 each</td>
</tr>
<tr>
<td>7.</td>
<td>Flat file (02 Nos.) 150 mm &amp; 200 mm.</td>
<td>01 each</td>
</tr>
<tr>
<td>8.</td>
<td>Half round file (200 mm).</td>
<td>01 No.</td>
</tr>
<tr>
<td>9.</td>
<td>Hack saw frame with handle (for 12&quot; long blade) along with 10 Nos. of blades.</td>
<td>01 Set</td>
</tr>
<tr>
<td>10.</td>
<td>Screw drivers (in mm) 04 Nos. 50x3, 100x4, 125x6, 150x8.</td>
<td>01 each</td>
</tr>
<tr>
<td>11.</td>
<td>Oil Can 1/2 pint capacity.</td>
<td>01 No.</td>
</tr>
<tr>
<td>12.</td>
<td>Steel measuring tape (05 meter long).</td>
<td>01 No.</td>
</tr>
<tr>
<td>13.</td>
<td>Nose plier 150 mm</td>
<td>01 No.</td>
</tr>
<tr>
<td>14.</td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td>Note: Tools shall be of Taparia / Jhalani / Everestmake.</td>
<td></td>
</tr>
</tbody>
</table>
Specifications of Mini Multipurpose Fire Tender
(For Pipeline)

1.0 Scope:

The Mini Multipurpose Fire Tender including all accessories should be designed & manufactured as per sound engineering practice. All the equipment & accessories should be fixed on the appliance in a compact & neat manner & should be so placed that each part is easily & readily accessible for use and maintenance.

This specification covers the general requirements regarding materials performance and acceptance tests for Mini Multipurpose Fire tender to be used for Rescue & Fire Fighting. The scope of supply shall be inclusive of but not limited to the following:

a. Chassis having 7-8 tons GVW (BS III/applicable emission norms in that region) with power steering, bought by vendor on behalf of GAIL (India) Ltd. Manufacturing of Chassis must be latest, not more than 06 months old from the date of PO.

b. A Water Mist High Pressure pump of not less than 150 lpm, at discharge pressure of not less than 100 bars.

c. A Power Take off Unit or suitable power transmission should be provided for transmitting power high pressure water mist pump with above features.


e. 01 number of high pressure water mist Hose Reel of 30 Mtrs length.

f. A battery operated amplifier system shall be provided.

g. Rear view camera with visual display in crew cabin to be provided.

h. Control panels.

i. Secured lockers for Safety & Rescue Equipment.

j. Single compartment driver cabin of seating capacity 02 seats and other tools in box, fixed/hinged lockers type arrangement.

k. 02 nos. light weight 6.8-6.9 LTR WC, 300 bar, Dragger/MSA/Scott/Honeywell make B.A Set, with 02 nos. spares cylinder as per EN 137: 2006 Type II as per attached specification in Annexure B.

l. 01 nos. portable Battery operated Hydraulic Spreader and Cutter combination tool, 02 nos. fireman suit NFPA 1971, 02 nos. Low Temp Suit NFPA 1991, 02 nos. Portable Multi-gas (LEL, O2, H2S) Detector, 02 nos. Chemical Suit and other Safety Equipment as mentioned in this specification.

m. Piping, necessary controls, hose lines and other accessories, Complete accessories as per ANNEXURE-A, & as per requirement listed in this tender document.

2.0 General:

2.1 The Mini Multipurpose Fire Tender including all accessories shall be designed for oil and gas fire application and manufactured as per relevant Indian Standards and as per sound engineering practice. All valves shall be of lever operated ball valves type except of any other type of valves mentioned anywhere else in the specification.

2.2 The specification mentioned here under lays down the requirements regarding material, design, construction, workmanship and finish, accessories and acceptance test of Fire Tender.

2.3 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.

2.4 All material/equipment shall be BIS marked & where BIS is not specified / not available the material shall be of high quality from reputed manufacturer. The vendor shall be responsible for supplying all equipment/ accessories and properly fixing them on the chassis as described in this specification. Other details & requirements which are not covered under this specification ,but may be necessary to complete the Fire Tender and/or to fulfil the operation/performance requirement shall be provided by the vendor, who should be responsible for the design & construction of the complete appliance to the full satisfaction of the Owner (GAIL).
3.0 Chassis:

The Mini Multipurpose Fire Tender shall be fabricated and built on TATA/Ashok Leyland/Eicher chassis (BS III/applicable emission norms in that region) with power steering, superstructure (fire tender) GVW capacity of 7-8 tonnes (approx.) with payload of 4.0-4.5 tonnes to be bought by the vendor on behalf of GAIL (India) Limited after placement of P.O. New chassis manufacturing recently (not more than six month old from the date of order) shall be used for fire tender fabrication. Offered chassis details to be submitted with bid.

3.1 The chassis shall be supplied with tool kit, spare wheel assembly with tyre (arrangement shall be made to fit on the tender), hydraulic jack etc.

3.2 All wiring shall be properly fixed in position and shall be protected against heat, oil and physical damage. All wiring shall pass through PVC sleeves/ conduits and to be distributed through distribution box. Lighting shall be provided for cabin, lockers, roofs, panels and other required area in addition to normal vehicle lighting. Wiring shall be colour coded or marked suitably at junction/terminator. Wiring shall be rated for more than 120% of rated load and shall have minimum voltage drop/electrical losses. Circuit shall be suitably protected against over current, overheat.

3.3 Extra Leaf springs (as per load) shall be provided at rear, if required.

3.4 All important electrical circuits shall have separate fuses suitably indicated and grouped in a common fuse box located in an easily accessible position in the driver cabin.

3.5 Drag hook or eye of adequate strength & design shall be provided at the rear & front of the chassis. One towing hitch shall be provided at rear portion for towing minimum one tonne trailer.

4.0 Pump:

4.1 The high pressure water mist pump should have capacity of 150 LPM @ 100 bar which will be driven through separate PTO (other than main normal pressure pump).

4.2 The pumps should be powered through the chassis engine. Bidder shall specify the make, model of pump in the offer and send literature of pump with offer.

4.3 The suction side of the pump shall be able to connect directly to water tank hydrant discharge outlets and also under pressure to the water tank of the tender.

4.4 The pump shall be rear mounted on the chassis and shall be accessible and readily removable for use, repair and maintenance. The pump shall have its control panel at rear.

4.5 The pump shall be of rigid construction and shall be made of Gun metal / light alloy/SS, compatible with fire fighting water and foam compound suitable for use with saline water.

4.6 The delivery outlet of pump shall be connected to high pressure hose reel. It should have pressure relieving/overpressure protection at pump outlet.

4.7 The pump shall be able to take suction from the water tank in normal condition.

5.0 Water Tank:

5.1 Water tank of 1000 Litres capacity shall be suitably mounted on the chassis. It shall be fabricated out of SS 316/316L plates minimum 4mm thickness for bottom and remaining plates 3 mm thickness for sides & top and 3 mm thickness for removable baffles. The tank should be of welded construction & should be suitably baffled. 100% radiography should be followed at butt joint and report shall be submitted during inspection and supply. The welding shall be done using GTAW with ER 316 electrode and DP shall be done at all fillet joints. The tank should have adequate SS angle reinforcement.

5.2 It shall be provided with baffles across with 450 mm manhole flange to prevent surge while the vehicle is accelerating, cornering and braking and shall be so designed and mounted as to bring the centre of gravity as low as possible in the chassis. The baffles shall be arranged in a manner to facilitate the passage of a man throughout the Tank for cleaning purposes.

5.3 The tank shall be rectangular / elliptical in shape, corrugated/flat sheet type from sides for better strength and maximising space availability and mounted on chassis. It shall be flexible type to prevent the tanks distortion due to the chassis flexion. The mounting shall permit full contents of the tank to flow into the pump. The tank
shall be mounted on the vehicle on a sub-frame. This sub-frame shall be made from anti-corrosive treated MS section and shall be bolted with the chassis using the high tensile bolts.

5.4 An inspection manhole of not less than 450 mm size shall be provided on top with hinged or removable cover and shall be marked ‘WATER’.

5.5 Suitable eyes shall be provided on the shell of the tank to enable it to be lifted off the vehicle for repair /replacement as necessary.

5.6 A cleaning hole of 250 mm diameter shall be provided at the bottom of the tank. The cleaning hole shall be provided with a 25 mm dia. drain pipe with a valve and plug connection and shall be taken down to a point well below the chassis without reducing the effective ground clearance.

5.7 The tank shall be fitted with min. 50mm. bore overflow pipes and the discharge end shall be taken below the chassis without reducing the effective ground clearance.

6.8 Tank should have following connections to facilitate the operation:
   a. Hydrant – Tank (01 number).
   b. Tank - Pump- Hose reels (high pressure).

5.9 The filling connections in the tank shall be suitable dia. and shall be fitted with 63mm inst. Male connections of SS with removable strainer & blank cap & NRV.

5.10 The tank shall be connected to the pump with a ball valve.

5.11 A water level indicator (graduated glass tube) with isolation valve shall be provided close to the pump control panel indicating Full, ¼, ½, ¾ & empty. In addition to this an electronic/digital water tank level indicator meter shall be provided at pump panel and crew cabin. It shall be suitably illuminated, calibrated and marked.

5.12 The complete tank shall be painted with epoxy paint after thorough cleaning & surface preparation, both internally and externally after fabrication to protect against corrosion. Suitable anticorrosion treatment shall done internally and externally of tank.

5.13 The engineering of the tank should be of good quality so as to increase the life of the tank and should be of least maintenance. The tank shall be mounted on chassis so as to prevent the surges while the vehicle is accelerating, cornering and braking and shall be so designed and mounted as to bring the centre of gravity as low as possible in the chassis.

5.14 The tank should have provision to avoid vacuum and over pressure.

5.15 Material test certificate for tank material and all other relevant test certificates shall be submitted along with fire tender.

6.0 Foam Tank:

6.1 Foam Compound (for AFFF- IS: 4989 & UL-162 approved) tank of 200 litres capacity shall be mounted on the chassis. Supply of foam is not in vendor scope. However the foam required for performance and other foam system test is in vendor scope. Tank should be fabricated out of SS 316/316L plates of minimum 4 mm thickness for bottom and 3 mm thickness for sides & top. All internal and external surfaces shall be suitably treated to resist corrosion and shall be painted. Anticorrosion treatment shall be applied internally and externally to foam tank and all lines carrying foam compound and solution.

6.2 The foam tank shall be mounted on ridged or flexible mounting pads to prevent distortion due to chassis flexion. It shall be of rigid type with welded construction & rectangular shape with curvature at bottom. In addition a 2% of expansion space should be made in the tank, over & above foam compound capacity. 100% radiography should be followed at butt joint and report shall be submitted during inspection and supply. Butt weld joint to be kept as minimum. The welding shall be done using GTAW with ER 316 electrode and DP shall be done at fillet joints. The tank should have adequate SS angle reinforcement.

6.3 The foam tank shall be fitted on all four sides to prevent the surges while the vehicle is accelerating, cornering and braking and shall be so designed and mounted as to bring the centre of gravity as low as possible in the chassis. Suitable eyes shall be provided on the shell of the tank to enable it to be lifted off the vehicle for repair /replacement as necessary. The tank shall be mounted on the vehicle on a sub-frame. This sub-frame shall be made from SS 316 or MS channels (as per site condition e.g. corrosion issues in humid and coastal regions) and shall be bolted with the chassis using the high tensile bolts.
6.4 The tank shall be fitted with a sludge trap. The tank shall also have a 25 mm drain pipe with a valve and plug incorporated in it. The bottom of the tank should have a slight slope towards the sludge trap.

6.5 The tank shall have a removable (threaded) filling orifice/inspection cap of not less than 150 mm dia for foam filling from top of the tank. It shall be provided with removable strainer and cap should be marked as ‘FOAM’.

6.6 The tank shall be provided with a breather valve to avoid vacuum during drawing of foam from tank and pressurization during filling of foam in tank.

6.7 All plumbing shall be reasonably accessible for maintenance purpose. Screwed bends, joints shall be avoided as far as possible. All the outlet and inlets to tanks shall be taken by installing nozzles of SS 316/316L and shall have suitable reinforcement pads of SS 316/316L.

6.8 The draw off line shall be connected to the high pressure pump inlet/outlet as the case may be for 3-6% foam compound induction in water stream. The draw-off pipe shall be fitted with removable strainer and ball valve of S.S material

6.9 Foam tank shall be tested for leakage period of 24 Hrs.

6.10 Material test certificate and all other relevant test certificates for tank shall be submitted along with fire tender.

7.0 Foam Proportioning System:

FOR HIGH PRESSURE WATER MIST PUMP: The around pump foam proportioner/inductor (capacity for 3% induction) with selector valve should be provided to induct 3% foam. The proportioner should be so installed that it should not be liable to mechanical or other damage. It shall be calibrated. Make, model and literature of foam proportioner to be submitted with offer.

8.0 Hose Reel:

The high pressure hose reels, 01 number should be provided. Hose length should be 30 meter. High pressure hose shall be rated for not less than 150 bar working pressure and not less than 220 bar test pressure. It shall have geared winding system. At the discharge end of the hose reel, a high-pressure water mist gun capable of discharging 75 LPM @ 100 bars in jet and mist patterns shall be connected. The interchange of pattern from jet to mist and mist to jet should be provided in mist gun. The jet range should not be less than 20 Mtrs. & the water droplets in the spray form should be of approximately 100-200 microns at 100 bar pressure.

9.0 Cooling System (Engine and PTO)

10.0 Safety Equipment.

10.1 Portable Battery operated Hydraulic Spreader and Cutter combination tool-01 Set:
Battery-powered hydraulic; compact, lightweight, cordlesscombitool (spreader and cutter) of make: HOLMATRO/AMKUS/LUKAS should be supplied meeting the following specification as minimum i.e. tools having following mentioned rating or higher rating should be supplied:

a. Maximum spreading travel in mm: 268
b. Maximum spreading force (at back of tips) kN: 52
c. Maximum cutting force (in notch) kN: 218
d. Maximum cutting force (blade center) kN : 83
e. Maximum pulling force kN : 29.3
f. Maximum pulling distance mm: 327
g. Weight, ready for use kg (approx.): 15

The set should include combitool, pelican/equivalent hard case, AC Battery Charger, additional battery. Accessories to be supplied with set: DC Power Cord (12V - 24V DC input); Pulling Chains; Pulling Adapters. Make, models & literature of equipment offered by bidder should be submitted with offer and supply.

10.2 Lifting and pulling winch along with tool-01 Set, Pulling & Lifting Machine (01 complete set with tool kit) should be supplied with vehicle; Make – Tractel/Maxpul/Hercules/Crown.
It should be portable manual hoists used with flexible wire rope. Safe working loads should be more than 3 ton for material handling. It should be supplied with minimum 20 M suitable wire rope along with single block, anchoring hook/other required tools. It should be suitable to lift, pull and position loads over great distances depending on the wire rope length. It should be operated by a simple lever.

Make, models & literature of equipment offered by bidder should be submitted with offer and supply.

10.3 Fireman suit NFPA 1971- 04 nos. (as per GAIL Specification)
10.4 Low Temp Suit NFPA 1991- 02 nos. (as per GAIL Specification)
10.5 Portable Multi-gas (LEL, O2, H2S) Detector- 02 nos. (as per GAIL Safety Specification)
10.6 Chemical Suit- 02 nos. (as per GAIL Specification).

10.7 Traffic Control Equipment:
Supply of traffic control equipment.
I. HDP cone for traffic control having height of 2.5 feet having base of 12” dia marked with radium strips, stackable-10 nos. along with 50 meter plastic chain.
II. Sign board of 30” x 12” made from 20 SWG MS plate with heavy duty frame and folding stand painting with following : Road closed, Gas Leak – Fire Hazard, No smoking – Danger, 02 each
The above marking should be of reflective material.
Portable battery operated 04 sets of flashing glow light bars shall be supplied.

10.8 Portable intrinsically safe High power Lamp:
10.8.1 High Power (output more than 1000 lumen) Portable light meeting our following specification requirement, make: Wolflite/Pelican/Brightstar should be supplied.

10.8.2 The rechargeable high power output LED area lighting system/flood light shall be intrinsically safe type for use in hazardous area Zone 1 i.e. class 1, division 1, Group A/B; or Ex ib IIC T3 or higher safety rating. It shall be ATEX/CSA/IECEx/UL approved for safety rating/hazardous area use.

10.8.3 It should be portable (weight not more than 24 Kgs.). The battery and control circuit should be enclosed inside the impact resistance, corrosion resistance robust enclosure box made of SS material. It should have lighting system/flood light control circuit, high/low switch function, battery level indication emergency power fails illumination, and low battery cut-off.

10.8.4 The lamp source should be LEDs (cluster/array of LED) having total light output of not less than 1000 lumen. It should have peak luminous intensity of more than 200 Lux at 5M distance from lamp head.

10.8.5 The light duration (after full charge of battery) at high power should be 11-12 hrs. approx. and at low power should be 22-24 hrs. approx. The flood light should be powered by rechargeable type battery of sufficient capacity/rating (12 V, sealed lead acid battery, more than 30 Ah rating) meeting our above light output and burn time.

10.8.6 It should be supplied with AC main charger and vehicle charger unit. The lamp housing should be swilling type to point the light in desired direction.

Make, models & literature of equipment offered by bidder should be submitted with offer and supply.
Sufficient size, secured lockers should be provided in vehicles for safety equipment in addition to other equipment.

11.0 Pipings

11.1 All piping should be sized so as to have minimum pressure drop and achieve the required pressure and flow at various locations.

11.2 All pipe fittings and valves should be SS 316 or cast equivalent.

11.3 All piping should be seamless and designed for 10% over the maximum pressures encountered in the pipe.

11.4 The piping should be flanged for ease of maintenance. However, flange joins kept minimum.

11.5 All lines should be hydraulically tested at 1.5 times the design pressure However, in no case should the lines be hydraulically tested below 21 kg/cm2(g).

11.6 All lines should be suitably supported so as to provide rigidity and avoid vibrations.
11.7 All lines less than 1.5” NB size can be socket welded to matching pipe rating fittings. All lines above 2” NB size should be butt welded with full penetration welds.

11.8 All gaskets in foam lines should be spiral wound with SS-316 and asbestos filler.

11.9 All bolting should be of SS-316 or cast equivalent.

11.10 The foam draw off pipe should be provided in such a manner and in such a position that sludge not pass into foam piping.

11.11 100% radiography shall be done for butt welded joints of piping. Documents shall be submitted along with appliance.

12.0 Body Work:

12.1 Enclosed accommodation shall be provided for two men in front portion of compartment including driver. The driver’s seat shall be adjustable type. Provision for fixing of PA system/base shall be in crew cabin. All seats shall have foam cushions and shall be covered with good quality Rexene. Door on either side shall be fitted with safety glasses (splinter proof) and winding type regulators. Door locking arrangement with single key operation shall be provided. The cabin floor shall be provided with 3-4 mm rubber mating. One roof light shall be provided in the driver’s cabin. Dual sun visors and long arm outside fitting rear view mirror shall be fitted to the cab. 02 nos. wall mounted portable fans shall be provided/fitted for officer seat and driver seat.

12.2 The seats shall be provided with seat belts.

12.3 Battery shall be placed in totally enclosed box with sealed gland for cable entry.

12.4 Installed battery of chassis shall have a charging facility from external source at its location itself.

12.5 Fabricator shall ensure that the power distribution is sufficient for all electrical equipments/devices to be used at a time. Extra battery backup may be provided if required.

12.6 Provision shall be made on dashboard for installation of VHF set with separate power supply. Supply of VHF set is not the scope of vendor (as per user site requirement).

12.7 The entire structure of the Fire Tender including that of driver’s cabin shall be a welded structure made from MS (as per GAIL site requirement) pressed sections and channels with thick aluminium sheet panelling outside. The cross members and supports of MS channels shall be electroplated/hot dip galvanized. Fabrication shall confirm to Motor Vehicles Act & BIS. Shutter space below chassis shall be fully utilised.

12.8 All lockers above chassis shall have Anodized Aluminium rolling type shutters. The top shall have roof, thereby providing a working platform for access to tank and other maintenance activity. The bottom of all the lockers should be of chequered aluminium plate of 3mm thickness fitted on the base frame to avoid bending of the plate.

12.9 All the lockers shall be fitted with internal lighting with suitably located ‘ON/OFF’ switch. A master switch for isolating the locker lighting circuit shall also be fitted in the driver’s cab.

12.10 All the lockers shall have snap coupling belt fasteners to keep equipments in its place and order.

12.11 All the lockers shall have self-drainage of all wash down water.

12.12 Grab rails (Double) and non-slip step of heavy chequered plate shall be provided to give access to the roof of the vehicle.

12.13 A GRAND/reputed BRAND make battery operated Multitone hooters/mike with amplifier & flashing light BEACON system shall be provided. Microphone shall be provided in the driver’s cabin. One loud speaker with standard make hooters like HWOTONE hooters shall be mounted on the driver’s cabin roof. Amplifiers and microphone shall be provided in front of officer’s seat in sealed box. Light bar shall have at least three lights on each side and shall have sound range of 1 Km. It shall be protected by wire mesh.

12.14 All electrical system including that of the chassis must be through conduits and terminals in weather proof junction box. Battery cut off switch should be provided inside cabin. All electrical circuits shall have separate fuses suitably marked and grouped in a common fuse located in an easily accessible position. Provision shall be made for minimum 04 spare fuses in the box provided in cabin. Layout drawing of entire electrical wiring shall be submitted along with fire tender.

12.15 The entire structure of appliance including that of drivers cabin shall be welded structure made from
anticorrosion treated made of 14 SWG MS pressed section and channels structural steel (IS 2062) with minimum 16 SWG aluminium panelling. Complete flooring shall be of 16 SWG aluminium chequered plate. The cross members and supported channels should be zinc electroplated 50 microns for the channels and 20 microns for supports.

12.16 The control panel of foam/water operation shall be done on aluminium sheets of 16 SWG/2 mm.

12.17 The vehicle shall be covered from Top with 3 mm chequered plate having rainwater channel at both side. The openings for equipments shall be sealed properly to ensure no water goes inside. Lockers, roof joints shall be sealed properly to avoid water ingress and corrosion.

12.18 The complete vehicle including the chassis shall be coated with best quality anti corrosive treatment/paint.

12.19 Strong grab rails shall be provided at the rear of vehicle for access to top of vehicle and foot boards shall be covered with 3 mm aluminium chequered plates.

12.20 No part of bodywork shall reduce road clearance as that of chassis nor increase the overall width at that of chassis.

12.21 All spares, safety equipment as per Annexure shall have proper place in the mini MP Fir tender. These spares shall have firm fixing arrangement. Placement of spares, safety equipment shall not disturb while Tender is accelerating, braking or moving on the poor road conditions. All these spares shall be easily accessible and shall have arrangement to remove them easily.

13.0 Control Panel:

13.1 The appliance shall have control panel for water/foam system operation.

13.2 Panel for water/foam system adequately illuminated shall be provided at rear/side of appliance. All controls of the system shall be spaced properly and marked for easy operation. No valve shall be of wheel type.

13.3 All controls of the system shall be spaced properly and marked for easy operation. All valves shall be of lever operated type & shall be made of SS with Teflon seats.

13.4 Line diagram for Water and Foam system along with SOP shall be provided in rear of vehicle near rear pump operation panel/pump.

13.5 All other controls like electrical siren, PA system shall be provided at the driver's cabin. All control panels shall have clearly written operating instruction plate. Adequately illuminated operating panels shall include the following:

a. Auxiliary throttle control for the engine.
b. Pump pressure gauge.
c. Hydrant connection for water tank filling.
d. Foam tank isolation valve control.
e. Foam proportioner valve control.
f. Electronic gauges for foam and water level in addition to normal tube gauges.
g. Pump suction – water tank isolating valve control.
h. Water and foam tank level indication of the graduated glass tube with isolating cock valve (suitable protected) type or other suitable type shall be provided.
i. Lighting for control panel illumination.
j. Operating instruction plate; & flushing out instruction plate.
k. Valve of Hose reels.
l. Drain valves.
m. All pressure gauges shall be made of SS dial and needles to be immersed in fluid.

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.

The dashboard panel in the driver's cabin should have:

In addition to chassis manufacturer features following should be provided at dashboard.
a) Siren switch.
b) Foam and water level electronic gauges (bar type). This is in addition to tube gauges provided at rear side of vehicle.
c) Rear view camera display screen.
d) PA system control panel.
e) Foam, Water system flow diagram.
f) Master switch for batteries to be provided in driver cabin.

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.

14.0 Workmanship and Finish:

14.1 The standard of workmanship and finish of all mechanical and other parts should be such that the parts normally required to be replaced can be easily & conveniently replaced and fitted correctly.

14.2 Workmanship executed shall be of highest quality and order. All rivets & bolts shall have a coat of approved paint on both surfaces before riveting or bolting, welding. All steel screws, bolts, nuts. Studs, rivets etc. shall be zinc coated or shall have rust proof coats by a recognized process. All the material used material used in the fabrication of the body work shall be of good quality or approved make and type. All equipment and material shall comply with the requirements of the latest relevant IS specifications.

14.3 All the lockers and pump compartment shall be covered with extruded aluminium roller shutter of reputed make of best quality. Roller shutter shall be water tight when closed. The roller shutter shall be durable, maintenance free, weather & corrosion resistant. Guide rail shall support the shutter over entire length. The extruded aluminium roller shutter shall be powder coated/anodized to a smooth finish and aesthetic view. The roller shutter shall have mechanism to hold the shutter in partly opened condition and should not free fall.

14.4 All the portable equipments over top of the vehicle shall be provided with suitable bag/cover for protection from rain dust etc.

14.5 The equipments shall be covered by aluminium panelling from outside.

14.6 The gross vehicle weight of the Fire Tender with all equipments, consumable & crew should be approximately 85% of permissible axle load of chassis manufacturer's specification. The weight distribution diagram, equipment layout shall be submitted along with the offer.

15.0 Painting & Marking:

15.1 The entire appliance shall be painted in 'Red' IS: 5 SHADE NO: 536,0.12 to 0.2 mm thickness, using double coat spray painting on the outside. The paint shall conform to IS: 2932. The painting process shall be performed as: a) each capable of passivating the metal and ensuring adequate adhesion for subsequent coat to a dry film thickness (DFT) of 6 microns shall first be applied. b) Acrylic polyurethane based sealer / shall be applied to a DFT of 40 microns to guarantee and excellent gloss hold out, chip resistance and uniform base colour shall be the second coat. c) Top Coat- Two coats of lead free, chromate free acrylic polyurethane shall be applied providing excellent coverage and durability.

15.2 On either side of the Vehicle Logo of 'GAIL' and 'GAIL (India) Limited' monogram and "Mini Multipurpose Fire Tender" shall be affixed (radium/HDPE sticker) in contrast colour at suitable places bilingually.

15.3 The driver's compartment shall be laminated and the inside of lockers shall be painted cream. Lockers shall be finished in shadow board painting to show the position of each pieces of equipment.

15.4 The chassis and wheel arches shall be painted black.

15.5 All the water piping shall be painted Red (fire red), all the foam lines shall be painted Yellow and High Pressure Water Mist Pipeline shall be painted Sea Green.

15.6 Two coats of anticorrosion paint and one zinc phosphate priming coat shall be applied before painting of Fire tender including chassis.

15.7 For, all water fittings like Branch Pipes etc. Quick Release type couplings are provided which enables the
operator to locate the desired equipment instantly and thereby save valuable time at the time of fire. These Couplings also ensure that none of the items damage the internal paneling and thereby increase the life of the vehicle. Suitable clamps, brackets, holders etc. are provided for all other items.

15.8 Identification of each equipment placed in the Tender, shall be marked in a Brass/AL plate near the placement of the equipment.

15.9 The vehicle shall be clearly and permanently marked with the following, preferably on a metal plate attached in the driver’s cabin and also near pump operating control panels:
   a) Manufacturer’s name or trade mark.
   b) Year of Manufacture.
   c) Capacity of Pump in l/min., water tank and foam tank in litres.
   d) Engine and chassis number.
   e) All instrument controls shall be identified with name plates.
   f) All hoses & valves inlet & outlet shall also be identified by suitable name plates.

16.0 Spares:

Following spares shall be provided along with fire tender:

   a. Valve of all type / sizes = 02 nos. each.
   b. Cap along with stud-nut–bolts for manhole of water tank, foam tank = 01 each.
   c. Drain cap with nut-bolts of water tank, foam tank = 02 each.
   d. All type pressure gauge = 02 nos. for each type.
   e. All type spares of landing valve (gland nut, spindle, wheel, washer, chuck nut, nut & bolts, L V sheet, gasket) = 02 nos. each.
   f. All size / type of NRV = 02 nos. each size/type.
   g. Spares for water mist pump: mechanical seals, shaft sleeves, bearing, gaskets, glands and other consumables: 02 numbers/sets of each.
   h. Two tool boxes as given in annexure-C.

17.0 Accessories:

The Mini Multipurpose Fire Tender shall also be provided with the following accessories in addition to those normally fitted to the chassis. All the accessories shall be suitably fixed in position or shall be kept in lockers or other suitable place as on the tender. Electrical fittings shall be weather proof & equipment should be ISI marked.

17.1 Electrically operated siren - 01 No. 12 V with range 1km. to be mounted externally on Top. Make: Kheraj/Philips.
17.2 Fog lamps powered by the battery of the Vehicle, these shall be low mounted in front of the vehicle - 02 Nos.
17.3 Reversing lights - 04 Nos., suitably situated to assist reversing.
17.4 Blinker type traffic indicators - 02 Sets.
17.5 Twin colored revolving light with beacon on top & blinker light on rear side- 01 Set, cabin roof mounted (Lukas or some other standard make).
17.6 Good quality 01 numbers LED floods light with 100 mtrs. length of cable having more than 5000 lumen with suitable stand - 01 Set.
17.7 All tools of standard make required for normal routine maintenance of the Fire Tender & Emergency Work (Carpenter, Electrical, & Engg tools box), which are not included with the kit of the chassis – 01 complete Set each.
17.8 Removable CCOE/PESO Approved spark arrester fitted to the exhaust of the engine - 01 no. CCOE Certificate required at the time of supply.
17.9 Public address system: (Philips or Ahuja make) Battery operated with a control panel in driver’s cabin shall be provided. One loud speaker shall be mounted on driver’s cabin roof. The range shall be 1 KM in still air and 500 mtrs. in noisy areas.
List of Equipment as per ANNEXURE “A” attached with this specification and other equipment confirming to specify respective IS shall be provided.

18.0 Acceptance Tests (Fire Tender):

Following tests shall be carried out before accepting the vehicle at manufacturer’s workshop / site to the complete satisfaction of owner’s inspector without any extra cost.

18.1 The design of the Tender shall be such that it should not affect the chassis characteristics as specified by the chassis manufacture such as speed, turning circle, acceleration, breaking efficiency with appliance fully loaded, etc.

18.2 The pump shall run for a continuous period of minimum 2 hours at the rated capacity mentioned earlier. During test the engine temp. should not exceed the rated temp.

18.3 All the piping for normal pressure shall be tested to a hydrostatic test pressure of 18.0 Kg/cm² for a minimum period of 2 hrs. and high pressure water mist system at 150% of operating pressure.

18.4 Water and Foam tank shall be tested for leakage after fabrication before applying any paint. The tanks shall be kept full with water and shall be observed for 24 hrs for any leakage.

18.5 The stability of the appliance shall be such that when under fully equipped and laden condition, if the surface on which the appliance stands is tilted to either side, the point at which the overturning occurs is not passed at an angle of 27 ½” from horizontal.

18.6 Quality of material of vessel and thickness of vessel plate shall be inspected and stamped by a recognised third party, inspectors and shall be produced at the time of 2nd stage inspection.

18.7 Gradient of appliance shall be tested on the test ramp which has an angle/ rise slope of 1m in every 4m of distance travelled.

19.0 Documents/Information Required From Vendors:

19.1 Bidder shall submit following with offer, Non submission of the same shall lead to Technical Rejection of the Offer.

19.1.1 The basic layout of the tender as per requirement.

19.1.2 Fire Tender test facilities at vendor site.

19.1.3 Individual flow diagram of Foam & water system of Fire tender.

19.1.4 Load distribution calculation (laden & un-laden weight, total load on axle to be approximately 85% of the rated load capacity of axles).

19.1.5 Layout drawing showing the detailed engineering of Water tank, Foam tank, and associated system as per our specifications listed in this tender.

19.1.6 Electric load calculation.

19.1.7 Documents required (with offer) as mentioned in the specification.

19.2 After award of order following documents are to be submitted before fabrication for approval of GAIL:

19.2.1 Detailed Flow diagram of the appliance (Indicating pipe sizes).

19.2.2 Quality Assurance Plan.

19.2.3 Plan and elevation of the appliance showing various equipment.

19.2.4 Pump characteristics & performance curves with the pump working on hydrant & the Water tank, with manufacturer catalogues & model no. etc.

19.2.5 Line diagram showing all piping and valve etc.

19.2.6 Line diagram of all electrical circuits.

19.2.7 Catalogues & technical details for all major parts like Pump, Chassis, Hose reel, BA set, valves and fittings, brought out items with model no. to be sent along with offer and supply.

19.2.8 All relevant test certificates and approval shall be submitted along with supply.

19.3 On placement of order, vendor shall submit the stage wise inspecting plan for approval of GAIL. Job shall be undertaken after receipt of approval from GAIL. Inspection will be carried out by GAIL/GAIL appointed TPI or both.
First stage: Inspection of chassis at vendor’s site. Construction of under-structure, Water, Foam tanks. Documents related to Quality of material of vessel / tanks and thickness of vessel plate / tanks, radiography inspected and stamped by recognised third party inspector shall be produced at the time of 2nd stage inspection.

Second stage: Placement of all tanks, fittings, lockers, pump, quality of fabrication, checking of anticorrosion treatment / painting, electrical fittings.

Third stage: Performance test of all the systems, pump, load & stability test of fire tender, testing of equipments / tools & appliances, checking of all relevant documents etc.

19.4 Technical Documents to be supplied by bidder along with the appliance.
19.4.1 Operation & maintenance manual along with parts list-Six sets.
19.4.2 All technical literature of major brought out items-Six sets.
19.4.3 Original/transparencies after incorporating the as built information shall be got signed by the GAIL Inspection engineer before submitting to GAIL for records -Six sets.
19.4.4 Final drawings as described in above-Six sets.
19.4.5 Import documents for imported equipments (if any)-Six sets.
19.4.6 ISI Mark Certificate and CCE approval certificate for Extinguisher &cylinders etc.-1 Copy Each.
19.4.7 Radiography & Test certificate of Water, Foam tanks, pipe welding, safety valve etc.-1 Copy Each.
19.4.8 Calibration certificate of pressure safety valve (high pressure pump system), pressure gauge.
19.4.9 Hydro test certificate of hose reels, hoses, piping & fittings etc.
19.4.10 All relevant test certificates of tanks as per QAP.
19.4.11 02 sets of soft copies of all above mentioned documents shall be supplied in addition to hard copy.

19.5 Manufacturer’s Declaration For Tanks:
Leakage if observed in the tanks within 3 years of supply due to design / manufacturing / material defects shall be rectified by the supplier free of cost. The confirmation from bidder for the same shall be given in writing along with the bid and supply.

19.6 Insurance, Road Tax & Permanent Registration:
All the documents shall be prepared with beneficiary as GAIL (India) Ltd. Bidder shall arrange for all insurance liabilities, RTO documentation, statutory payment (road tax, registration, fitness, PUC etc.) at respective state RTO including transit period i.e. from the time of chassis is taken over by the bidder from /its Authorized Dealer for fabrication of Fire Tender complete in all respect till the time it is accepted by GAIL after delivery at Site.
For chassis, copy of all relevant documents e.g. insurance, registration, road tax payment and other RTO payment shall be handed over to GAIL site by bidder immediately after buying/taking over of chassis from /its Authorized Dealer.
The bidder has to submit the following documents at the time of delivery of vehicle with beneficiary as GAIL (India) Ltd. Bidder shall renew the documents to meet the validity period of the documents as required at its own cost.
19.6.1 Transit insurance.
19.6.2 Comprehensive Insurance Policy from recognized Insurance Agency of Fire Tender valid for the period of one year beyond the date of acceptance of vehicle at GAIL Site
19.6.3 Road Tax Payment to RTOs (Vehicle manufacturing state RTO and RTO of GAIL Site) valid for the period of one year beyond the date of acceptance of vehicle at GAIL Site.
19.6.4 Permanent registration certificate of Vehicle from GAIL site RTO shall be obtained by vendor.

20.0 Buyback of Old Fire Tender In Case of Replacement of Fire Tender As Per GAIL Policy

GAIL intent to buyback existing fire tender fabricated on ----- chassis, model: ----. Bidder may see the fire tender and fully evaluate the fire tender on its own before quoting the rate of new fire tender. Bidder is required to quote for new fire tender and is also required to take back the old fire tender, in its then state/condition, and manner as given below:
20.1 Bidder shall not quote separate price for old fire tender.
20.2 Bidder is required to quote the bid price after taking into account the value of old fire tender. The details of old fire tender are given in technical specification of tender (Annexure----).
20.3 All taxes, duties, documentation and other expenditure required and incurred in taking the buyback of old fire tender from GAIL, Site is in vendor’s scope. No invoice should be generated from GAIL; however the bidder shall pay all the taxes and duties as decided by the RTO.
20.4 Bidder should not sell the old fire tender to any of the GAIL employees or his family member as per GAIL Rules.

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**Annexure-A**

**Schedule of Equipments to be Stowed in the Appliance**

<table>
<thead>
<tr>
<th>SN</th>
<th>ITEM</th>
<th>QTY (NOS.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Fireman axe (as per IS)</td>
<td>01</td>
</tr>
<tr>
<td>2</td>
<td>Intrinsically safe torch (LED) Wolflite/Pelican with minimum 120 lumen, area classifications rating for Zone-0 application (IEC/ATEX/UL approved).</td>
<td>02</td>
</tr>
<tr>
<td>3</td>
<td>Intrinsically safety rechargeable hand lamp (LED) Wolflite/Pelican with minimum light output of 350 lumen, area classifications rating for Zone-1 application (IEC/ ATEX / UL approved).</td>
<td>02</td>
</tr>
<tr>
<td>4</td>
<td>Portable fire extinguisher DCP, 09 Kg Stored pressure type (IS marked), ABC Type, 90% MAP</td>
<td>04</td>
</tr>
<tr>
<td>5</td>
<td>Portable CO2 fire ext., 4.5 Kg.(ISI marked &amp; CCEO approved)</td>
<td>02</td>
</tr>
<tr>
<td>6</td>
<td>Rescue rope 20 meter length, 12-15 mm, Polypropylene</td>
<td>02</td>
</tr>
<tr>
<td>7</td>
<td>Fire Hook (IS 927-1964)</td>
<td>01</td>
</tr>
<tr>
<td>8</td>
<td>Fire beater (IS 1931-1972)</td>
<td>04</td>
</tr>
<tr>
<td>9</td>
<td>Lock Cutter</td>
<td>02</td>
</tr>
<tr>
<td>10</td>
<td>First Aid Box for 10 person (Contents as per Factory Act)</td>
<td>01</td>
</tr>
<tr>
<td>11</td>
<td>Crow Bar (IS704-1968)</td>
<td>01</td>
</tr>
<tr>
<td>13</td>
<td>BA set as per our enclosed specs. in annexure ‘B’</td>
<td>02</td>
</tr>
<tr>
<td>14</td>
<td>Burn dressing 144 sq. inch (18x8 inch or 14x14 inch) CE marked.</td>
<td>04</td>
</tr>
<tr>
<td>15</td>
<td>Earth wire / electrical continuity wire with crocodile connection, 05 meters.</td>
<td>02 nos.</td>
</tr>
<tr>
<td>16</td>
<td>Tool kit as per enclosed specifications in Annexure ‘C’</td>
<td>02 set</td>
</tr>
<tr>
<td>17</td>
<td>Non sparking tools (Beryllium free Aluminum Bronze alloy)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Brass Hammer, size: 02kg = 01 no.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Double open end Spanners (Size: 19x22, 24x27, 26x27, 30x32) = 02 no. each.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Hack —saw blade (OAL – 300mm) = 05nos.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Hack — saw Frame (OAL- 540mm) = 01no.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tools shall be of Mekaster / Snapon / Hindustan Everest / Hebei Boton or Equivalent make only</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>All the above items should be confirming to relevant IS and as specified in relevant item description.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>All above said items shall be placed and fixed in vehicle with proper holders, clamps etc.</td>
<td></td>
</tr>
</tbody>
</table>
Specifications of Multipurpose Fire Tender
(For Pipeline)

1.0 Scope:

The Multipurpose Fire Tender including all accessories should be designed & manufactured as per IS and sound engineering practice. All the equipment & accessories should be fixed on the appliance in a compact & neat manner & should be so placed that each part is easily & readily accessible for use and maintenance.

This specification covers the general requirements regarding materials performance and acceptance tests for Multipurpose Fire tender to be used for Fire Fighting. The scope of supply shall be inclusive of but not limited to the following:

1.1 Chassis having 12-13 tons GVW (BS III/applicable emission norms in that region) with power steering, wheel base 3400-3800 mm to be bought by vendor on behalf of GAIL (India) Ltd. Manufacturing of Chassis must be latest, not more than 06 months old from the date of PO.

1.2 A normal pressure Centrifugal type pump of CE marked Firefly/Godiva /Rosenbauer make capable of delivering 1800 LPM @ 7.0 kg/cm².

1.3 A Water Mist High Pressure pump of not less than 150 lpm, at discharge pressure of not less than 100 bars.

1.4 A Heavy duty full torque Power Take off Unit of Martin Harper / Webster / VAS / Firefly MAKE capable of transmitting power for driving the Normal Pressure Pump & small high pressure water mist pump with above features.

1.5 A stainless steel (SS-316/316L- based on site requirement) Water tank of 2000 ltrs. Capacity, and 200 ltrs. foam tank.

1.6 A aqua monitor of not less than 1800 LPM/500 GPM @ 7.0 Kg/CM².

1.7 02 nos. of high pressure water mist Hose Reel of 30 Mtrs length each and 01 normal pressure hose reel of 60 Mtrs length shall be provided.

1.8 There shall be two numbers of trolley mounted 50 Kg DCP Extinguishers, IS Marked, PBC powder.

1.9 A battery operated amplifier system shall be provided.

1.10 Rear view camera with visual display in crew cabin to be provided.

1.11 Control panels.

1.12 Secured lockers for Safety & Rescue Equipment.

1.13 Single compartment driver cabin of seating capacity five (02 front independent seats and 03 at rear bench type) and other tools in box, fixed/hinged lockers type arrangement.

1.14 10 nos. of synthetic hose (yellow/red colour) of 15mtr. Length with SS couplings, type B, IS: 636 Marked as mentioned in Annexure A.

1.15 02 nos. light weight 6.8-6.9 L WC, 300 bar, Dragger/MSA/Scott/Honeywell make B.A Set, with 02 nos. spares cylinder as per EN 137: 2006 Type II as per attached specification in Annexure B.

1.16 01 nos. portable Battery operated Hydraulic Spreader and Cutter combination tool, 01 nos. lifting and pulling winch along with tools, 01 set of Lifting Air Bag, 01 set of High Pressure Leak Arresting/Handling Kit, 04 nos. fireman suit NFPA 1971, 02 nos. Low Temp Suit EN 469, 02 nos. Portable Multi-gas (LEL, O2, H2S) Detector, 02 nos. Chemical Suit and other Safety Equipment as mentioned in this specification.

1.17 Piping, necessary controls, hose lines and other accessories, Complete accessories as per ANNEXURE-A, & as per requirement listed in this tender document.

2.0 General:

2.1 The Multipurpose Fire Tender including all accessories shall be designed for oil and gas fire application and manufactured as per relevant Indian Standards and as per sound engineering practice. All valves shall be of lever operated ball valves type except of any other type of valves mentioned anywhere else in the specification.

2.2 The specification mentioned here under lays down the requirements regarding material, design, construction, workmanship and finish, accessories and acceptance test of Fire Tender.

2.3 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.

2.4 All material/equipment shall be BIS marked & where BIS is not specified / not available the material shall be of high quality from reputed manufacturer. The vendor shall be responsible for supplying all equipment/accessories and properly fixing them on the chassis as described in this specification. Other details & requirements which are not covered under this specification, but may be necessary to complete the Fire Tender and/or to fulfill the operation/performance requirement shall be provided by the vendor, who should be responsible for the design & construction of the complete appliance to the full satisfaction of the Owner (GAIL).

3.0 Chassis:

The Multipurpose Fire Tender shall be fabricated and built on TATA/Ashok Leyland/Man/Volvo/Eicher/Bharat Benz chassis (BS III/applicable emission norms in that region) with power steering, superstructure (fire tender) GVW capacity of 12-13 tonnes (approx.) to be bought by the vendor on behalf of GAIL (India) Limited after placement of P.O. New chassis manufacturing recently (not more than six month old from the date of order) shall be used for fire tender fabrication. Offered chassis details to be submitted with bid.

3.1 The chassis shall be supplied with tool kit, spare wheel assembly with tyre (arrangement shall be made to fit on the tender), hydraulic jack etc.

3.2 All wiring shall be properly fixed in position and shall be protected against heat, oil and physical damage. All wiring shall pass through PVC sleeves/ conduits and to be distributed through distribution box. Lighting shall be provided for cabin, lockers, roofs, panels and other required area in addition to normal vehicle lighting. Wiring shall be colour coded or marked suitably at junction/terminator. Wiring shall be rated for more than 120 % of rated load and shall have minimum voltage drop/electrical losses. Circuit shall be suitably protected against over current, overheat.

3.3 Extra Leaf springs (as per load) shall be provided at rear, if required.

3.4 All important electrical circuits shall have separate fuses suitably indicated and grouped in a common fuse box located in an easily accessible position in the driver cabin.

3.5 Drag hook or eye of adequate strength & design shall be provided at the rear & front of the chassis. One towing hitch shall be provided at rear portion for towing minimum one tonne trailer.

4.0 Pump:

4.1 The Multipurpose Tender shall be mounted with centrifugal type pump of Firefly/GODIVA/Rosen Bauer make capable of delivering 1800 LPM @ 8.5 kg/cm2 approx. at 3 M suction lift.

4.2 The high pressure water mist pump should have capacity of 150 LPM @ 100 bar which will be driven through separate PTO (other than main normal pressure pump).

4.3 Both the pumps should be powered through the chassis engine via PTO. The Heavy duty full torque PTO unit shall be capable of transmitting power to pump by suitable propeller shaft.

4.4 Bidder shall specify the make, model of pump in the offer and send literature of pump with offer.

4.5 The suction side of the pump shall be able to connect directly to hydrant discharge outlets and also under pressure to the water tank of the tender.

4.6 The pump shall be rear mounted on the chassis and shall be accessible and readily removable for use, repair and maintenance. The pump shall have its control panel at rear.

4.7 The pump shall be of rigid construction and shall be made of Gun metal / light alloy, compatible with fire fighting water and foam compound with stainless steel shaft suitable for use with saline water. The pump impeller shaft shall be carried in antifriction bearings.

4.8 The pump's impeller neck rings and impeller rings shall be renewable types and the gland shall be of self-adjusting type. A drain plug shall be provided at the bottom of the casing.

4.9 PRIMER: The pump shall be fitted with pump manufacturer primer. It shall be capable of lifting water at least through 7.0 meter at a rate not less than 30 cm/sec. It shall be of such design as would not lead to its mechanical failure, would be easy in maintenance and would work satisfactorily even if it has been left dry for a long period.

4.10 The delivery outlet of pump shall be connected to monitor and four numbers of screwed 63 mm delivery female
outlets instantaneous type with blank caps at the rear side along with twist type lugs made of gun metal. The monitor outlets should be fitted with lever operated ball valves.

4.11 The pump shall have one suction inlet threaded type at rear side & should be provided with strainers which should be removable easily. The pump shall be able to take suction from the water tank in normal condition.

5.0 Power Take Off Unit (PTO):

5.1 The power take off unit of suitable gear ratio to match the engine & pump characteristics shall be provided.

5.2 Separate PTO should be provided for each normal pressure pump & high pressure water mist pump powered from vehicle engine.

5.3 PTO shall be operated pneumatically with push button/lever in crew cabin.

5.4 Necessary support for PTO units, propeller shaft couplings, universal joints etc shall be provided.

5.5 The drive assembly component (shaft, couplings) shall be dynamically balanced.

5.6 The details of the PTO such as its make, name of the manufacturer etc, supported with catalogue/ drawing shall be submitted along with the offer.

5.7 The PTO shall be Martin Harper / Webster / VAS / Firefly make and bidder shall specify make, model of PTO with offer and sent literature with the offer.

6.0 Water Tank:

6.1 Water tank of 2000 Litres capacity shall be suitably mounted on the chassis. It shall be fabricated out of SS 316/316L plates minimum 5mm thickness for bottom and remaining plates 4 mm thickness for sides & top and 3mm thickness for removable baffles. The tank should be of welded construction & should be suitably baffled. 100% radiography should be followed at butt joint and report shall be submitted during inspection and supply. The welding shall be done using GTAW with ER 316 electrode and DP shall be done at all fillet joints. The tank should have adequate SS angle reinforcement.

6.2 It shall be provided with baffles across with 450 mm manhole flange to prevent surge while the vehicle is accelerating, cornering and braking and shall be so designed and mounted as to bring the centre of gravity as low as possible in the chassis. The baffles shall be arranged in a manner to facilitate the passage of a man throughout the Tank for cleaning purposes.

6.3 The tank shall be rectangular / elliptical in shape, corrugated sheet type from sides for better strength and maximising space availability and mounted on chassis. It shall be flexible type to prevent the tanks distortion due to the chassis flexion. The mounting shall permit full contents of the tank to flow into the pump. The tank shall be mounted on the vehicle on a sub-frame. This sub-frame shall be made from anti-corrosive treated MS section and shall be bolted with the chassis using the high tensile bolts.

6.4 An inspection manhole of not less than 450 mm size shall be provided on top with hinged or removable cover and shall be marked ‘WATER’.

6.5 Suitable eyes shall be provided on the shell of the tank to enable it to be lifted off the vehicle for repair /replacement as necessary.

6.6 A cleaning hole of 250 mm diameter shall be provided at the bottom of the tank. The cleaning hole shall be provided with a 25 mm dia. drain pipe with a valve and plug connection and shall be taken down to a point well below the chassis without reducing the effective ground clearance.

6.7 The tank shall be fitted with min. 50mm. bore overflow pipes and the discharge end shall be taken below the chassis without reducing the effective ground clearance.

6.8 Tank should have following connections to facilitate the operation:

6.8.1 Hydrant – Tank (01 number on both sides).

6.8.2 Tank - Pump- Hose reels (high pressure).

6.8.3 Tank – Pump- 2 nos. deliveries.

6.8.4 Tank – Pump - Monitor (Aqua foam monitor).

6.8.5 Hydrant to Hose Reel (normal pressure).

6.8.6 Pump delivery to PTO, engine radiator cooling tank and back to pump suction.
6.9 The filling connections in the tank shall be suitable dia. and shall be fitted with 63mm inst. Male connections of SS with removable strainer & blank cap & NRV.

6.10 The tank shall be connected to the pump with a ball valve.

6.11 A water level indicator (graduated glass tube) with isolation valve shall be provided close to the pump control panel indicating Full, ¾, ½, ¼ & empty. In addition to this an electronic/digital water tank level indicator meter shall be provided at pump panel and crew cabin. It shall be suitably illuminated, calibrated and marked.

6.12 The complete tank shall be painted with epoxy paint after thorough cleaning & surface preparation, both internally and externally after fabrication to protect against corrosion. Suitable anticorrosion treatment shall be done internally and externally of tank.

6.13 The engineering of the tank should be of good quality so as to increase the life of the tank and should be of least maintenance. The tank shall be embossed with Die Pressed stiffeners on all four sides to prevent the surges while the vehicle is accelerating, cornering and braking and shall be so designed and mounted as to bring the centre of gravity as low as possible in the chassis.

6.14 The tank should have provision to avoid vacuum and overpressure.

6.15 Apart from the above, all facility shall be as per IS: 10460 for water tank.

6.16 Material test certificate for tank material and all other relevant test certificates shall be submitted along with fire tender.

7.0 Foam Tank:

7.1 Foam Compound (for AFF - IS: 4989 & UL-162 approved) tank of 200 litres capacity shall be mounted on the chassis. Supply of foam is not in vendor scope. However the foam required for performance and other foam system test is in vendor scope. Tank should be fabricated out of SS 316/316L plates of minimum 4 mm thickness for bottom and 3 mm thickness for sides & top. All internal and external surfaces shall be suitably treated to resist corrosion and shall be painted. Anticorrosion treatment shall be applied internally and externally to foam tank and all lines carrying foam compound and solution.

7.2 The foam tank shall be mounted on ridged or flexible mounting pads to prevent distortion due to chassis flexion. It shall be of rigid type with welded construction & rectangular shape with curvature at bottom. In addition a 2% of expansion space should be made in the tank, over & above foam compound capacity. 100% radiography should be followed at butt joint and report shall be submitted during inspection and supply. Butt weld joint to be kept as minimum. The welding shall be done using GTAW with ER 316 electrode and DP shall be done at fillet joints. The tank should have adequate SS angle reinforcement.

7.3 The foam tank shall be fitted on all four sides to prevent the surges while the vehicle is accelerating, cornering and braking and shall be so designed and mounted as to bring the centre of gravity as low as possible in the chassis. Suitable eyes shall be provided on the shell of the tank to enable it to be lifted off the vehicle for repair / replacement as necessary. The tank shall be mounted on the vehicle on a sub-frame. This sub-frame shall be made from SS 316 or MS channels (as per site condition e.g. corrosion issues in humid and coastal regions) and shall be bolted with the chassis using the high tensile bolts.

7.4 The tank shall be fitted with a sludge trap. The tank shall also have a 25 mm drain pipe with a valve and plug incorporated in it. The bottom of the tank should have a slight slope towards the sludge trap.

7.5 The tank shall have a removable (threaded) filling orifice/inspection cap of not less than 150 mm dia. for foam filling from top of the tank. It shall be provided with removable strainer and cap should be marked as ‘FOAM’.

7.6 The tank shall be provided with a breather valve to avoid vacuum during drawing of foam from tank and pressurization during filling of foam in tank.

7.7 All plumbing shall be reasonably accessible for maintenance purpose. Screwed bends, joints shall be avoided as far as possible. All the outlet and inlets to tanks shall be taken by installing nozzles of SS 316/316L and shall have suitable reinforcement pads of SS 316/316L.

7.8 The draw off line shall be connected to the foam compound proportioner / inductor of normal pressure pump and high pressure water mist pump. The draw-off pipe shall be fitted with removable strainer and ball valve of S.S material. Separate control valves should be provided for both foam line.

7.9 Foam tank shall be tested for leakage period of 24 Hrs.
7.10 Material test certificate and all other relevant test certificates for tank shall be submitted along with fire tender.

8.0 Foam Proportioning System:

8.1 FOR NORMAL PRESSURE PUMP: Around the pump foam proportioner/inductor type (capacity for 3% induction) with selector valve should be provided between suction & delivery of the pump to induct 3% foam solution in the water stream with no loss in delivery pressure from the pump. The proportioner should be so installed that it should not be liable to mechanical or other damage. The selector valve should have variable setting between ON & OFF positions. It shall be calibrated for hose & monitor operation and combination operation. Make, model and literature of foam proportioner to be submitted with offer.

8.2 Auxiliary Connection: Auxiliary connection for foam pickup tube with strainers shall be provided to enable the foam compound to be induced into the pump directly from the drums or outside source. 3 M pick up tube with 600 mm length SS 316 dip pipe & strainer shall also be provided for this purpose.

8.3 FOR HIGH PRESSURE WATER MIST PUMP: The around pump foam proportioner/inductor (capacity for 3% induction) with selector valve should be provided to induct 3% foam. The proportioner should be so installed that it should not be liable to mechanical or other damage. It shall be calibrated. Make, model and literature of foam proportioner to be submitted with offer.

9.0 Aqua Monitor

9.1 There shall be one number of Multipurpose (Water-cum-Foam) Aqua Foam Monitor of 1800 LPM/500 GPM @ 7 Kg/cm2. It shall be made of SS 316 with bronze bearing/worm. It shall be provided with drain valve. Make, model & literature of offered monitor to be submitted with offer.

9.2 The monitor shall be connected through pipeline to the discharge outlet of the pump and provided with ball valve near monitor.

9.3 The monitor shall be lever/wheel operated and shall be capable of traversing through 360 degree in a horizontal plane, +45 degree & above up and -15 degree down in the vertical plane.

9.4 The horizontal throw range of water and foam at 7 Kg/cm2 pressure shall not be less than 40 and 35 mtr respectively in still air.

9.5 The monitor nozzle shall have a variation for fog pattern application, and shall design / manufacture in such a way that jet & spray shall create wind velocity in favourable wind direction.

9.6 A suitable place shall be provided for the operator to stand and operate the monitor comfortably in any direction.

10.0 Water Hose Reels:

10.1 A normal pressure hose reel of 60m length should be provided at a rear place on the appliance. The first aid hose reel (braided non kinking hose IS marked) operating at normal pump pressure shall be provided along with hydrant to hose reel, pump to hose reel connection. It shall have gear operated winding system.

10.2 The high pressure hose reels, 02 numbers should be provided on either side of vehicle. Hose length should be 30 meter. High pressure hose shall be rated for not less than 150 bar working pressure and not less than 220 bar test pressure. It shall have geared winding system. At the discharge end of the hose reel, a high-pressure water mist gun capable of discharging 75 LPM @ 100 bars in jet and mist patterns shall be connected. The interchange of pattern from jet to mist and mist to jet should be provided in mist gun. The jet range should not be less than 20 Mtrs. & the water droplets in the spray form should be of approximately 100-200 microns at 100 bar pressure.

11.0 Cooling System (Engine and PTO)

11.1 A suitable capacity additional heat exchanger for cooling of engine coolant shall be provided. The water cooling system for PTO oil and Engine coolant heat exchanger shall be directly connected to pump discharge side.

11.2 The cooling system shall be of closed circuit type i.e., cooling water should go back to pump. It shall provide adequate cooling to PTO and engine for high efficiency during stationery and prolonged operation of fire tender. Lever operated ball valves shall be provided for cooling line flow control and draining hot water at engine
coolant heat exchanger.

11.3 The heat exchanger (PTO and cooling tank for Engine Coolant) piping shall be of copper for effective cooling.

11.4 A set (02 nos. each) of flexible hoses and clamps connecting engine radiator to heat exchanger shall be supplied with fire tender.

12.0 Safety Equipment

12.1 Portable Battery operated Hydraulic Spreader and Cutter combination tool-01 Set. Battery-powered hydraulic; compact, lightweight, cordlesscombitool (spreader and cutter) of make: HOLMATRO/AMKUS/LUKAS should be supplied meeting the following specification as minimum i.e. tools having following mentioned rating or higher rating should be supplied:

12.1.1 Maximum spreading travel in mm: 268
12.1.2 Maximum spreading force (at back of tips) kN: 52
12.1.3 Maximum cutting force (in notch) kN: 218
12.1.4 Maximum cutting force (blade center) kN: 83
12.1.5 Maximum pulling force kN: 29.3
12.1.6 Maximum pulling distance mm: 327
12.1.7 Weight, ready for use kg (approx.): 15

The set should include combitool, pelican/equivalent hard case, AC Battery Charger, additional battery.

Accessories to be supplied with set: DC Power Cord (12V - 24V DC input); Pulling Chains; Pulling Adapters.

Make, models & literature of equipment offered by bidder should be submitted with offer and supply.

12.2 Lifting and pulling winch along with tool-01 Set,

Pulling & Lifting Machine (01 complete set with tool kit) should be supplied with vehicle; Make – Tractel/Maxpul/Hercules/Crown.

It should be portable manual hoists used with flexible wire rope. Safe working loads should be more than 3 ton for material handling. It should be supplied with minimum 20 M suitable wire rope along with single block, anchoring hook/other required tools. It should be suitable to lift, pull and position loads over great distances depending on the wire rope length. It should be operated by a simple lever.

Make, models & literature of equipment offered by bidder should be submitted with offer and supply.

12.3 Lifting Air Bag- 01 Set

One set of air lifting bag should be provided with the emergency rescue tender. The Air Lifting Bag should have manufactured out of neoprene reinforced by Kevlar threads. The bags should be fitted with specially designed non-return quick release couplings.

12.3.1 Pneumatic lifting bags: Pneumatic lifting bags are used to lift accidental vehicles/equipment etc. for rescuing purpose.

<table>
<thead>
<tr>
<th>Make: Vetter/Holmatro/SAVA, Capacity : 3-40 MT</th>
<th>17</th>
<th>39</th>
<th>5.8 (for set)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lifting capacity in ton, or more</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nominal working pressure (approx.)</td>
<td>8 bar / 116 psi</td>
<td>8 bar / 116 psi</td>
<td>1 bar / 14.5 psi</td>
</tr>
<tr>
<td>Lifting Height in cm, or more</td>
<td>24</td>
<td>38</td>
<td>45</td>
</tr>
<tr>
<td>Air Required at working pressure in liters (approx.)</td>
<td>195</td>
<td>650</td>
<td>650 (for set)</td>
</tr>
<tr>
<td>Qty.</td>
<td>01</td>
<td>01</td>
<td>02 (set)</td>
</tr>
</tbody>
</table>

12.3.2 Accessories: High pressure & low pressure hoses, pressure regulators, breathing apparatus air cylinder, control boxes required for satisfactory performance of the above equipment.

12.3.3 BA Cylinders: Total 04 nos. of SS/Carbon Composite BA cylinders of 300 bar rated pressure capacity as per above system requirement, and air volume not less than 2000L to be supplied with the lifting equipment set.

Space shall also be provided for keeping additional same number of above sets.

Make, models & literature of equipment offered by bidder should be submitted with offer and supply.

12.4 Fireman suit NFPA 1971- 04 nos. (as per GAIL Specification).

12.5 Low Temp Suit EN 469- 02 nos. (as per GAIL Specification).
12.6 Portable Multi-gas (LEL, O₂, H₂S) Detector- 02 nos. (as per GAIL Safety Specification)
12.7 Chemical Suit- 02 nos. (as per GAIL Specification).
12.8 Traffic Control Equipment: Supply of traffic control equipment.
  12.8.1 HDP cone for traffic control having height of 2.5 feet having base of 12” dia marked with radium strips, stackable-10 nos. along with 50 meter plastic chain
  12.8.2 Sign board of 30” x 12” made from 20 SWG MS plate with heavy duty frame and folding stand painting with following: Road closed, Gas Leak – Fire Hazard, No smoking – Danger, 02 each
The above marking should be of reflective material.
Portable battery operated 04 sets of flashing glow light bars shall be supplied.
12.9 Portable intrinsically safe High power Lamp:
  12.9.1 High Power (output more than 1000 lumen) Portable light meeting our following specification requirement, make: Wolfite/Pelican/Brightstar should be supplied.
  12.9.2 The rechargeable high power output LED area lighting system/flood light shall be intrinsically safe type for use in hazardous area Zone 1 i.e. class 1, division 1, Group A/B; or Ex ib IIC T3 or higher safety rating. It shall be ATEX/CSA/IECEx/UL approved for safety rating/hazardous area use.
  12.9.3 It should be portable (weight not more than 24 Kgs.). The battery and control circuit should be enclosed inside the impact resistance, corrosion resistance robust enclosure box made of SS material. It should have lighting system/flood light control circuit, high/low switch function, battery level indication emergency power fails illumination, and low battery cut-off.
  12.9.4 The lamp source should be LEDs (cluster/array of LED) having total light output of not less than 1000 lumen. It should have peak luminous intensity of more than 200 Lux at 5M distance from lamp head.
  12.9.5 The light duration (after full charge of battery) at high power should be 11-12 hrs. approx. and at low power should be 22-24 hrs. approx. The flood light should be powered by rechargeable type battery of sufficient capacity/rating (12 V, sealed lead acid battery, more than 30 Ah rating) meeting our above light output and burn time.
  12.9.6 It should be supplied with AC main charger and vehicle charger unit. The lamp housing should be swilling type to point the light in desired direction.
Make, models & literature of equipment offered by bidder should be submitted with offer and supply. Sufficient size, secured lockers should be provided in vehicles for safety equipment in addition to other equipment.

13.0 Pipings

13.1 All piping should be sized so as to have minimum pressure drop and achieve the required pressure and flow at various locations.
13.2 All pipe fittings and valves should be SS 316 or cast equivalent.
13.3 All piping should be seamless and designed for 10% over the maximum pressures encountered in the pipe.
13.4 The piping should be flanged for ease of maintenance. However, flange joins kept minimum.
13.5 All lines should be hydraulically tested at 1.5 times the design pressure. However, in no case should the lines be hydraulically tested below 21 kg/cm²(g).
13.6 All lines should be suitably supported so as to provide rigidity and avoid vibrations.
13.7 All lines less than 1.5” NB size can be socket welded to matching pipe rating fittings. All lines above 2” NB size should be butt welded with full penetration welds.
13.8 All gaskets in foam lines should be spiral wound with SS-316 and asbestos filler.
13.9 All bolting should be of SS-316 or cast equivalent.
13.10 The foam draw off pipe should be provided in such a manner and in such a position that sludge not pass into foam piping.
13.11 100% radiography shall be done for butt welded joints of piping. Documents shall be submitted along with appliance.
14.0 Body Work:

14.1 Enclosed accommodation shall be provided for two men in front portion of compartment including driver. Both the seats shall be independent. The driver’s seat shall be adjustable type. The rear area of compartment of driver’s cabin shall have one fixed seat for full width of cabin for crew members with back rest. Provision for fixing of PA system /base shall be in crew cabin. All seats shall have foam cushions and shall be covered with good quality Rexene. Door on either side shall be fitted with safety glasses (splinter proof) and winding type regulators. Door locking arrangement with single key operation shall be provided. The cabin floor shall be provided with 6mm rubber mating. One roof light shall be provided in the driver’s cabin. Dual sun visors and long arm outside fitting rear view mirror shall be fitted to the cab. 02nos. wall mounted portable fans shall be provided/fitted for officer seat and driver seat. The front glass of cabin shall be single piece.

14.2 In cabin the rear removable but hinged and secured seat with good support shall have box type arrangement to accommodate battery in enclosed box, tool box, and other important equipments.

14.3 Grab bar to be provided in centre of cabin for rear seat users. The seats shall be provided with seat belts.

14.4 Battery shall be placed in totally enclosed box with sealed gland for cable entry.

14.5 Installed battery of chassis shall have a charging facility from external source at its location itself.

14.6 Fabricator shall ensure that the power distribution is sufficient for all electrical equipments / devices to be used at a time. Extra battery backup may be provided if required.

14.7 Provision shall be made on dashboard for installation of VHF set with separate power supply. Supply of VHF set is not the scope of vendor.

14.8 The entire structure of the Fire Tender including that of driver’s cabin shall be a welded structure made from MS (as per GAIL site requirement) pressed sections and channels with thick aluminium sheet paneling outside. The cross members and supports of MS channels shall be electroplated/hot dip galvanised. Fabrication shall confirm to Motor Vehicles Act & BIS. Shutter space below chassis shall be fully utilised.

14.9 All lockers above chassis shall have Anodized Aluminium imported (MCD France or Fireco Italy make or equivalent) rolling type shutters. A suitable space shall be provided to keep 10 lengths of 63mm size fire hose each of 15 m length sufficient number of lockers for storage of equipments shall be provided with external access and at such height of about 1.67 mtrs. So as to be accessible from ground level. The top of lockers shall have roof, thereby providing a working platform for access to tank tops and also the roof mounted monitors. The bottom of all the lockers should be of chequered aluminium plate of 4mm thickness fitted on the base frame to avoid bending of the plate.

14.10 All the lockers shall be fitted with internal lighting with suitably located ‘ON/OFF’ switch. A master switch for isolating the locker lighting circuit shall also be fitted in the driver’s cab.

14.11 All the lockers shall have snap coupling belt fasteners to keep equipments in its place and order.

14.12 All the lockers shall have self-drainage of all wash down water.

14.13 Grab rails (Double) and non-slip step of heavy chequered plate shall be provided to give access on both sides to the roof of the appliance and for easy and speedy removal and mounting of ladder.

14.14 A GRAND/reputed BRAND make battery operated Multitone hooters/mike with amplifier & flashing light BEACON system shall be provided. Microphone shall be provided in the driver’s cabin. One loud speaker with standard make hooters like HWOTONE hooters shall be mounted on the driver’s cabin roof. Amplifiers and microphone shall be provided in front of officer’s seat in sealed box. Light bar shall have at least three lights on each side and shall have sound range of 1 Km., It shall be protected by wire mesh.

14.15 Ladder gallows of roller type shall be provided on the roof of the vehicle for easy placing/removal of 7.5m aluminium extension ladder. There shall be suitable gallows fitted with rollers and designed to facilitate easy & quick removal of the ladder by one man from the rear of the appliance.

14.16 All electrical system including that of the chassis must be through conduits and terminals in weather proof junction box. Battery cut off switch should be provided inside cabin. All electrical circuits shall have separate fuses suitably marked and grouped in a common fuse located in an easily accessible position. Provision shall be made for minimum 04 spare fuses in the box provided in cabin. Layout drawing of entire electrical wiring shall be submitted along with fire tender.

14.17 The entire structure of appliance including that of drivers cabin shall be welded structure made from
anticorrosion treated made of 14 SWG MS pressed section and channels structural steel (IS 2062) with minimum 16 SWG aluminium panelling. Complete flooring shall be of 16 SWG aluminium chequered plate. The cross members and supported channels should be zinc electroplated 50 microns for the channels ad 20 microns for supports.

14.18 The control panel of foam/water operation shall be done on aluminium sheets of 16 SWG/2 mm.

14.19 The vehicle shall be covered from Top with 3 mm chequered plate having rainwater channel at both side. The openings for equipments shall be sealed properly to ensure no water goes inside. Lockers, roof joints shall be sealed properly to avoid water ingress and corrosion.

14.20 The complete vehicle including the chassis shall be coated with best quality anti corrosive treatment/paint.

14.21 Strong grab rails shall be provided at the rear of vehicle for access to top of vehicle and foot boards shall be covered with 3 mm aluminium chequered plates.

14.22 No part of bodywork shall reduce road clearance to less than 36 cm nor increase the overall width more than 2.50m, the highest part of the appliance with the ladder and monitor mounted on it shall not reduce the angles of approach & departure below 30 degrees.

14.23 All spares, safety equipment as per Annexure-A & E shall have proper place in the tender. These spares shall have firm fixing arrangement. Placement of spares, safety equipment shall not disturb while Tender is accelerating, braking or moving on the poor road conditions. All these spares shall be easily accessible and shall have arrangement to remove them easily.

15.0 Control Panel:

15.1 The appliance shall have separate control panel for water/foam system operation.

15.2 Separate panel for water/foam system adequately illuminated shall be provided at rear side of appliance. All controls of the system shall be spaced properly and marked for easy operation. No valve shall be of wheel type.

15.3 All controls of the system shall be spaced properly and marked for easy operation. All valves shall be of lever operated type & shall be made of SS with Teflon seats.

15.4 Line diagram for Water and Foam system along with SOP shall be provided in rear of vehicle near rear pump operation panel/pump.

15.5 All other controls like electrical siren, PA system shall be provided at the driver’s cabin. All control panels shall have clearly written operating instruction plate. Adequately illuminated operating panels shall include the following:

a. Auxiliary throttle control for the engine.
b. Pump pressure gauge.
c. Hydrant connection for water tank filling pipes on either sides.
d. Delivery outlets of the pump along with the control levers and blank cap with chain.
e. Suction inlet of pump with blank cap & chain.
f. Control for using auxiliary foam pick-up tube.
g. Foam tank isolation valve control.
h. Foam proportioner valve control.
i. Electronic gauges for foam and water level in addition to normal tube gauges.
j. Pump suction – water tank isolating valve control.
k. Water and foam tank level indication of the graduated glass tube with isolating cock valve (suitable protected) type or other suitable type shall be provided.
l. Lighting for control panel illumination.
m. Operating instruction plate; & flushing out instruction plate.
n. Control for flushing out foam equipments & piping.
o. Compound Gauge.
p. Valve of Hose reels.
q. Drain valves.
r. All pressure gauges shall be made of SS dial and needles to be immersed in fluid.

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.

15.6 The dashboard panel in the driver's cabin should have:

In addition to chassis manufacturer features following should be provided at dashboard.

a) Siren switch.

b) Foam and water level electronic gauges (bar type). This is in addition to tube gauges provided at rear side of vehicle.

c) Rear view camera display screen.

d) PA system control panel.

e) Foam, Water system flow diagram.

f) PTO push button for engagement of PTO pneumatically. It should be labelled properly and protected with casing/box.

g) Master switch for batteries to be provided in driver cabin.

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.

16.0 Workmanship and Finish:

16.1 The standard of workmanship and finish of all mechanical and other parts should be such that the parts normally required to be replaced can be easily & conveniently replaced and fitted correctly.

16.2 Workmanship executed shall be of highest quality and order. All rivets & bolts shall have a coat of approved paint on both surfaces before riveting or bolting, welding. All steel screws, bolts, nuts. Studs, rivets etc. shall be zinc coated or shall have rust proof coats by a recognized process. All the material used material used in the fabrication of the body work shall be of good quality or approved make and type. All equipment and material shall comply with the requirements of the latest relevant IS specifications.

16.3 All the lockers and rear pump compartment shall be covered with extruded aluminium roller shutter of reputed make of best quality. Roller shutter shall be water tight when closed. The roller shutter shall be durable, maintenance free, weather & corrosion resistant. Guide rail shall support the shutter over entire length. The extruded aluminium roller shutter shall be powder coated/anodized to a smooth finish and aesthetic view. The roller shutter shall have mechanism to hold the shutter in partly opened condition and should not free fall.

16.4 If required, lower lockers shall be provided with flap type doors opening downwards. Heavy duty chain and hinges shall be provided on these doors so that these doors can be used as climbing step for access to upper lockers. Adequate grab handles shall be provided in upper lockers at convenient height for easy access.

16.5 Arrangement for keeping 04 numbers suction hoses shall be provided with suitable supports at convenient location.

16.6 All the portable equipments over top of the vehicle shall be provided with suitable bag/cover for protection from rain dust etc.

16.7 The equipments shall be covered by aluminium panelling from outside.

16.8 The gross vehicle weight of the Fire Tender with all equipments, consumable & crew should be approximately 85% of permissible axle load of chassis manufacturer’s specification. The weight distribution diagram, equipment layout shall be submitted along with the offer.

17.0 Painting & Marking:

17.1 The entire appliance shall be painted in 'Red' IS: 5 SHADE NO: 536, 0.12 to 0.2 mm thickness, using double coat spray painting on the outside. The paint shall conform to IS: 2932. The painting process shall be performed as:

a) each primer capable of passivating the metal and ensuring adequate adhesion for subsequent coat to a dry film thickness (DFT) of 6 microns shall first be applied. b) Acrylic polyurethane based sealer / primer shall be
applied to a DFT of 40 microns to guarantee and excellent gloss hold out, chip resistance and uniform base colour shall be the second coat. c) Top Coat- Two coats of lead free, chromate free acrylic polyurethane shall be applied providing excellent coverage and durability.

17.2 On either side of the Vehicle Logo of 'GAIL' and 'GAIL (India) Limited' monogram and "Multipurpose Fire Tender" shall be affixed (radium/HDPE sticker) in contrast colour at suitable places bilingually.

17.3 The driver's compartment shall be laminated and the inside of lockers shall be painted cream. Lockers shall be finished in shadow board painting to show the position of each pieces of equipment.

17.4 The chassis and wheel arches shall be painted black.

17.5 All the water piping shall be painted Red (fire red), all the foam lines shall be painted Yellow and High Pressure Water Mist Pipeline shall be painted Sea Green.

17.6 Two coats of anticorrosion paint and one zinc phosphate priming coat shall be applied before painting of Fire tender including chassis.

17.7 For, all water fittings like Branch Pipes etc. Quick Release type couplings are provided which enables the operator to locate the desired equipment instantly and thereby save valuable time at the time of fire. These Couplings also ensure that none of the items damage the internal paneling and thereby increase the life of the vehicle. Suitable clamps, brackets, holders etc. are provided for all other items.

17.8 Identification of each equipment placed in the Tender, shall be marked in a Brass/AL plate near the placement of the equipment.

17.9 The vehicle shall be clearly and permanently marked with the following, preferably on a metal plate attached in the driver’s cabin and also near pump operating control panels:

   a) Manufacturer’s name or trade mark.
   b) Year of Manufacture.
   c) Capacity of Pump in l/min., water tank and foam tank in litres.
   d) Engine and chassis number.
   e) All instrument controls shall be identified with name plates.
   f) All hoses & valves inlet & outlet shall also be identified by suitable name plates.

18.0 Spares:

Following spares shall be provided along with fire tender:

18.1 Valve of all type / sizes = 02 nos. each.
18.2 Cap along with stud-nut–bolts for manhole of water tank, foam tank = 01 each.
18.3 Drain cap with nut-bolts of water tank, foam tank = 02 each.
18.4 All type pressure gauge = 02 nos. for each type.
18.5 Landing valves (spare) = 02 nos.
18.6 All type spares of landing valve (gland nut, spindle, wheel, washer, chuck nut, nut & bolts, L V sheet, gasket) = 02 nos. each.
18.7 All size / type of NRV = 02 nos. each size/type.
18.8 Required spares for monitors = 02 nos. each.
18.9 Spares for water/foam pump and water mist pump: mechanical seals, shaft sleeves, bearing, gaskets, glands and other consumables: 02 numbers/sets of each.
18.10 Two tool boxes as given in annexure-C.

19.0 Accessories:

The Multipurpose Fire Tender shall also be provided with the following accessories in addition to those normally fitted to the chassis. All the accessories shall be suitably fixed in position or shall be kept in lockers or other suitable place as on
the tender. Electrical fittings shall be weather proof & equipment should be ISI marked.

19.1 Electrically operated siren - 01 No. 12 V with range 1km. to be mounted externally on Top. Make: Kheraj/Philips.
19.2 Fog lamps powered by the battery of the Vehicle, these shall be low mounted in front of the vehicle - 02 Nos.
19.3 Reversing lights - 04 Nos., suitably situated to assist reversing.
19.4 Blinker type traffic indicators - 02 Sets.
19.5 Twin colored revolving light with beacon on top & blinker light on rear side- 01 Set, cabin roof mounted (Lukas or some other standard make).
19.6 Good quality 02 nos. LED floods light with 100 mtrs. length of cable having more than 5000 lumen each with suitable stand - 01 Set.
19.7 Portable Inspection Lamp with brackets to be clamped to the battery-01 No.
19.8 All tools of standard make required for normal routine maintenance of the Fire Tender & Emergency Work (Carpenter, Electrical & Engg tools box), which are not included with the kit of the chassis – 01 complete Set each.
19.9 Removable CCOE/PESO Approved spark arrester fitted to the exhaust of the engine - 01 no. CCOE Certificate required at the time of supply.
19.10 Wind screen wipers (Electrically operated of approved design) if not provided with the chassis.
19.11 Public address system : (Philips or Ahuja make) Battery operated with a control panel in driver's cabin shall be provided. One loud speaker shall be mounted on driver's cabin roof. The range shall be 1 KM in still air and 500 mtrs. in noisy areas.

List of Equipments as per ANNEXURE "A" attached with this specification and other equipments confirming to specify respective IS shall be provided.

20.0 Acceptance Tests (Fire Tender):

Following tests shall be carried out before accepting the vehicle at manufacturer’s workshop / site to the complete satisfaction of owner's inspector without any extra cost.

20.1 The design of the Tender shall be such that it should not affect the chassis characteristics as specified by the chassis manufacture such as speed, turning circle, acceleration, breaking efficiency with appliance fully loaded, etc.

20.2 The pump shall run for a continuous period of minimum 4 hours at the rated capacity mentioned earlier. During test the temp. of engine should not exceed the rated temp & that of lube oil 79 degrees C.

20.3 The priming device shall be tested with a vertical lift of 7.0 M measured from water level to the centre of suction eye of the pump at a rate of not less than 30cm/sec.

20.4 The monitor and hand lines, separately and in combination as mentioned earlier shall be tested for delivering water/foam at their rated capacity and horizontal range a mentioned in this specification.

20.5 Foam making equipment shall be applied to check the induction ratio of foam compound, total foam discharge rate and expansion ratio of foam production using the foam compound.

20.6 All the piping for normal pressure shall be tested to a hydrostatic test pressure of 18.0 Kg/cm2 for a minimum period of 2 hrs. and high pressure water mist system at 150% of operating pressure.

20.7 Water and Foam tank shall be tested for leakage after fabrication before applying any paint. The tanks shall be kept full with water and shall be observed for 24 hrs for any leakage

20.8 The stability of the appliance shall be such that when under fully equipped and laden condition, if the surface on which the appliance stands is tilted to either side, the point at which the overturning occurs is not passed at an angle of 27½ °’ from horizontal.

20.9 Quality of material of tank and thickness of plate shall be inspected and stamped by a recognised third party, inspectors and shall be produced at the time of 2nd stage inspection.

20.10 Gradient of appliance shall be tested on the test ramp which has an angle/ rise slope of 1m in every 4m of distance travelled.

21.0 Documents/Information Required from Vendors:
21.1 Bidder shall submit following with offer, Non submission of the same shall lead to Technical Rejection of the Offer.
21.1.1 The basic layout of the tender as per requirement (Indicative layout of Multipurpose Fire Tender is given in Annexure-E for illustration purpose).
21.1.2 Fire Tender test facilities at vendor site.
21.1.3 Individual flow diagram of Foam & water system of Fire tender.
21.1.4 Load distribution calculation (laden & un-laden weight, total load on axle to be approximately 85% of the rated load capacity of axles).
21.1.5 Layout drawing showing the detailed engineering of Water tank, Foam tank, and associated system as per our specifications listed in this tender.
21.1.6 Electric load calculation.
21.1.7 Documents required (with offer) as mentioned in the specification.

21.2 After award of order following documents are to be submitted before fabrication for approval of GAIL:
21.2.1 Detailed Flow diagram of the appliance (Indicating pipe sizes).
21.2.2 Quality Assurance Plan.
21.2.3 Plan and elevation of the appliance showing various equipment.
21.2.4 Pump characteristics & performance curves with the pump working on hydrant & the Water tank, with manufacturer catalogues & model no. etc.
21.2.5 Design calculations for water, foam system indicating material specifications, design pressure, adopted thickness for tank sheet & radiographic.
21.2.6 Line diagram showing all piping and valve etc.
21.2.7 Line diagram of all electrical circuits.
21.2.8 Catalogues & technical details for all major parts like Pump, PTO, Chassis, Hose reel, Monitor, BA set, valves and fittings, brought out items with model no. to be sent along with offer and supply.
21.2.9 All relevant test certificates and approval shall be submitted along with supply.

21.3 On placement of order, vendor shall submit the stage wise inspecting plan for approval of GAIL. Job shall be undertaken after receipt of approval from GAIL. Inspection will be carried out by GAIL/GAIL appointed TPI or both.

First stage : Inspection of chassis at vendor’s site. Construction of under- structure, Water, Foam tanks. Documents related to Quality of material of tanks and thickness of tanks, radiography inspected and stamped by recognised third party inspector shall be produced at the time of 2nd stage inspection.

Second stage : Placement of all tanks, fittings, lockers, pump, quality of fabrication, checking of anticorrosion 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.

21.4 Technical Documents to be supplied by bidder along with the appliance.
21.4.1 Operation & maintenance manual along with parts list-Six sets.
21.4.2 All technical literature of major brought out items-Six sets.
21.4.3 Original/transparencies after incorporating the as built information shall be got signed by the GAIL Inspection engineer before submitting to GAIL for records-Six sets.
21.4.4 Final drawings as described in above-Six sets.
21.4.5 Import documents for imported equipments (if any)-Six sets.
21.4.6 ISI Mark Certificate and CCE approval certificate for Extinguisher, Nitrogen, CO2 cylinders etc.-1 Copy Each.
21.4.7 Radiography & Test certificate of Water, Foam tanks, pipe welding etc.-1 Copy each.
21.4.8 Calibration certificate of pressure safety valve (high pressure pump system), pressure gauge.
21.4.9 Hydro test certificate of hose reels, hoses, piping & fittings etc.
21.4.10 All relevant test certificates of tanks as per QAP.
21.4.11 02 sets of soft copies of all above mentioned documents shall be supplied in addition to hard copy.

21.5 Manufacturer’s Declaration for Tanks:

Leakage if observed in the tanks within 3 years of supply due to design / manufacturing / material defects shall be rectified by the supplier free of cost. The confirmation from bidder for the same shall be given in writing along with the bid and supply.

21.6 Insurance, Road Tax & Permanent Registration:

All the documents shall be prepared with beneficiary as GAIL (India) Ltd. Bidder shall arrange for all insurance liabilities, RTO documentation, statutory payment (road tax, registration, fitness, PUC etc.) at respective state RTO including transit period i.e. from the time of chassis is taken over by the bidder from /its Authorized Dealer for fabrication of Fire Tender complete in all respect till the time it is accepted by GAIL after delivery at Site.

For chassis, copy of all relevant documents e.g. insurance, registration, road tax payment and other RTO payment shall be handed over to GAIL site by bidder immediately after buying/taking over of chassis from /its Authorized Dealer.

The bidder has to submit the following documents at the time of delivery of vehicle with beneficiary as GAIL (India) Ltd. Bidder shall renew the documents to meet the validity period of the documents as required at its own cost.

21.6.1 Transit insurance.

21.6.2 Comprehensive Insurance Policy from recognized Insurance Agency of Fire Tender valid for the period of one year beyond the date of acceptance of vehicle at GAIL Site.

21.6.3 Road Tax Payment to RTOs (Vehicle manufacturing state RTO and RTO of GAIL Site) valid for the period of one year beyond the date of acceptance of vehicle at GAIL Site.

21.6.4 Permanent registration certificate of Vehicle from GAIL site RTO shall be obtained by vendor.

22.0 Buy Back of Old Fire Tender in Case of Replacement of Fire Tender as per GAIL Policy

GAIL intent to buyback existing fire tender fabricated on ----- chassis, model: ----. Bidder may see the fire tender and fully evaluate the fire tender on its own before quoting the rate of new fire tender. Bidder is required to quote for new fire tender and is also required to take back the old fire tender, in its then state/condition, and manner as given below:

22.1 Bidder shall not quote separate price for old fire tender.

22.2 Bidder is required to quote the bid price after taking into account the value of old fire tender. The details of old fire tender are given in technical specification of tender (Annexure-----).

22.3 All taxes, duties, documentation and other expenditure required and incurred in taking the buyback of old fire tender from GAIL, Site is in vendor’s scope. No invoice should be generated from GAIL; however the bidder shall pay all the taxes and duties as decided by the RTO. Bidder should not sell the old fire tender to any of the GAIL employees or his family member as per GAIL Rules.

23.0 Bidder shall confirm the point wise specification, deviation if any should be mentioned clearly.

24.0 Signature & seal of bidder:
## Annexure-A

### Schedule of Equipments to be Stowed in the Appliance

<table>
<thead>
<tr>
<th>SN</th>
<th>ITEM</th>
<th>QTY (NOS.)</th>
<th>Vendor Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Delivery hose, non percolating flexible, yellow/red colour, ISI marked IS: 636, Type-B as per IS:636, 63mm dia and 15mtr. Length</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Suction hose of PVC/Rubber 100 mm int. dia in 2.5 mt. length fitted with 100 mm Suction Hose Couplings (IS 902-1974 2ND Rev.)</td>
<td>04</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Three Way Suction Collecting Head 100 mm Size (IS904-1965 2ND REV)</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Suction Wrenches for 100 mm Suction Couplings (IS 4643)</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Suction Strainer 100 mm size (IS-907-1965)</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Basket Strainer (Cylinder Type)(IS3582-1966)</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Dividing Breaching with Control Inst. Pattern (IS5131)</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Collecting Breaching Inst. pattern 63 mm.</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Inline foam inductor (225 lpm)</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Akron/Elkart make Multi-gallonage, multipurpose firefighting nozzles of lightweight aluminum/pyrolight, 750 lpm above flow with at least 4 flow setting from 300-750 lpm range without shutoff. It shall have spinning teeth of hard plastic/SS 316, jet range: 35-40 m at 7 bar. It should have jet, spary/fog pattern and should be provided with shut off valve. It shall conform to NFPA-1964 or latest rev.</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Water curtain (SS), TP branches(Al alloy/SS) (02 of each)</td>
<td>04</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>NRV Spanner (for NRV hydrant to tank water inlet)</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Adaptor for 100 mm suction female screw coupling and 63 mm male instantaneous. (As per IS903-1975 2ND Rev.)</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Adaptor Double female Inst. Pattern 63 mm (As per IS903-1975 2ND Rev.)</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Adaptor Double male Inst. Pattern 63 mm (As per IS903-1975 2ND Rev.)</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Fireman axe (as per IS)</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Intrinsically safe torch (LED) Wolfite/Pelican with minimum 120 lumen, area classifications rating for Zone-0 application (IEC/ATEX/UL approved).</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Intrinsically safety rechargeable hand lamp (LED) Wolfite/Pelican with minimum light output of 350 lumen, area classifications rating for Zone-1 application (IEC/ATEX/UL approved).</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Portable fire extinguisher DCP, 09 Kg Stored pressure type (IS marked), ABC Type, 90% MAP</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Portable fire extinguisher DCP, 04 Kg Stored pressure type (IS marked), ABC Type, 90% MAP</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Portable CO2 fire ext., 4.5 Kg.(ISI marked &amp; CCEO approved)</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rescue rope 20 meter length, 12-15 mm, Polypropylene</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Fire Hook (IS 927-1964)</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Fire beater (IS 1931-1972)</td>
<td>04</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Lock Cutter</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>7.5 m Al, Extension Ladder as per IS-4571</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>First Aid Box for 10 person (Contents as per Factory Act)</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>Crow Bar (IS704-1968)</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Sledge Hammer, 6.5 Kg (IS841-1968)</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>Spanner, adjustable, 30cm long handle (IS6169)</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Door Breaker</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>Hydraullic Jack-7.5 tonnes (in addition to that provided with chassis kit)</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>Safety Helmet-10 nos., Ear Plugs-100 nos., Ear Muffs- 10 nos., Safety Belt double Lanyard- 02 nos., Dust Mask- 50 nos., Hand Gloves- 100 nos., Industrial Gum Boot-05 pairs, Safety Goggle- 20 nos.,</td>
<td>01 Set</td>
<td></td>
</tr>
<tr>
<td>S No.</td>
<td>Description of material (in each tool box)</td>
<td>Quantity of tools (in each tool box)</td>
<td>Vendor Comments</td>
</tr>
<tr>
<td>-------</td>
<td>----------------------------------------------------------------------------------------------------------</td>
<td>-------------------------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>1.</td>
<td>Set of pipe wrench of sizes: - 8&quot;, 10&quot;, 12&quot;, 14&quot;, 18&quot;, 24&quot;, 36&quot;.</td>
<td>01 each</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Double open end spanner (set of 6 mm to 32 mm)</td>
<td>01 set</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6x7, 8x9, 10x11, 12x13, 14x15, 16x17, 18x19, 20x22, 21x23, 22x24, 24x26, 24x27, 25x28, 30x32</td>
<td>01 set</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Ring spanner set (06 mm to 32 mm)</td>
<td>01 set</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6x7, 8x9, 10x11, 12x13, 14x15, 16x17, 18x19, 20x22, 21x23, 24x26, 24x27, 25x28, 30x32 (Total 13 Nos.)</td>
<td>01 set</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Adjustable slide wrench (04 Nos.) (150 mm, 200, 250 mm &amp; 300 mm)</td>
<td>01 each</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Allen keys (in L shape) &amp; (size in MM) 1.5, 2, 2.5, 3, 4, 5, 6, 7, 8, 9, 10 &amp; 12 (12 Nos.)</td>
<td>01 each</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Combination pliers (02 nos.) 150 mm &amp; 200 mm.</td>
<td>01 each</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Flat file (02 Nos.) 150 mm &amp; 200 mm.</td>
<td>01 each</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Half round file (200 mm).</td>
<td>01 No.</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Hack saw frame with handle (for 12&quot; long blade) along with 10 Nos. of blades.</td>
<td>01 set</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Screw drivers (in mm) 04 Nos. 50x3, 100x4, 125x6, 150x8.</td>
<td>01 each</td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>Oil Can 1/2 pint capacity.</td>
<td>01 No.</td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>Steel measuring tape (05 meter long).</td>
<td>01 No.</td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>Nose plier 150 mm.</td>
<td>01 No.</td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>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.</td>
<td>01 set</td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td>Note: Tools shall be of Taparia / Jhalani / Everestmake.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Specifications of
DCP cum Foam Fire Tender
(As per guidelines of IS: 10460 & IS 10993 or latest IS)

1.0 Scope:

The Multi purpose Water cum Foam cum DCP Tender including all accessories should be designed & manufactured as per BIS / ISI and sound engineering practice. All the equipments & accessories should be fixed on the appliance in a compact & neat manner & should be so placed that each part is easily & readily accessible for use and maintenance.

This specification covers the general requirements regarding materials performance and acceptance tests for DCP cum Foam Fire tender to be used for Fire Fighting. The scope of supply shall be inclusive of but not limited to the following:

1.1 Chassis having 16 tons GVW (BS III/applicable emission norms in that region) with power steering to be bought by vendor on behalf of GAIL (India) Ltd. Manufacturing of Chassis must be latest, not more than 06 months old from the date of PO.

1.2 A Multi pressure (normal & high) Centrifugal type pump of CE marked Firefly/Godiva /Rosenbauer make capable of delivering 3000-4000 LPM (based on the site requirement) @ 8.5 kg/cm2.

1.3 A Heavy duty full torque Power Take Off Unit of Martin Harper / Webster / VAS / Firefly MAKE capable of transmitting power for driving the Pump with above features.

1.4 A stainless steel (SS-316/316L- based on site requirement) Water tank of 3000 ltrs. Capacity.

1.5 A stainless steel Foam Tank (SS-316/316L) of 500 ltrs. capacity.

1.6 A aqua foam monitor of not less than 2500 LPM @ 7.0 Kg/CM2.

1.7 A first aid and high pressure Hose Reel of 60 Mtrs length.

1.8 DCP unit: There shall be one vessel of 1000 Kgs DCP capacity (DCP as per OISD 116 & UL listed/approved 299C) and vessel shall be designed considering apparent density of the powder. It should be provided with 02 nos. hose reel of 30 Mtrs on either side of vehicle, manual override pneumatic control valve.

1.9 Expellant gas system having nitrogen gas in cylinders with 100% spare cylinders with change-over facility.

1.10 A battery operated amplifier system, rear view camera with visual display in crew cabin to be provided.

1.11 Control panels.

1.12 Single compartment driver cabin of seating capacity six (02 front independent seats and 04 at rear bench type) with arrangement for keeping BA set, fireman suits and other tools in box, fixed/hinged lockers type arrangement.

1.13 10 nos. of synthetic hose (yellow/red colour) of 15 mtr. Length with SS couplings, type B, IS: 636 Marked as mentioned in Annexure A.

1.14 02 nos. light weight 6.8-6.9 L WC, 300 bar, Dragger/MSA/Scott/Honeywell make B.A Set, with 02 nos. spares cylinder as per EN 137: 2006 Type II as per attached specification in Annexure B.

1.15 Piping, necessary controls, hose lines and other accessories, Complete accessories as per ANNEXURE-A, & as per requirement listed in this tender document.

2.0 General:

2.1 The DCP cum Foam Fire Tender including all accessories shall be designed for oil and gas fire application and manufactured as per relevant Indian Standards and as per sound engineering practice. All valves shall be of lever operated ball valves type except of any other type of valves mentioned anywhere else in the specification.

2.2 The specification mentioned here under lays down the requirements regarding material, design, construction, workmanship and finish, accessories and acceptance test of Fire Tender.

2.3 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.
2.4 All material/equipment shall be BIS marked & where BIS is not specified/not available the material shall be of high quality from reputed manufacturer. The vendor shall be responsible for supplying all equipment/accessories and properly fixing them on the chassis as described in this specification. Other details & requirements which are not covered under this specification, but may be necessary to complete the Fire Tender and/or to fulfill the operation/performance requirement shall be provided by the vendor, who should be responsible for the design & construction of the complete appliance to the full satisfaction of the Owner (GAIL).

3.0 Chassis:

The DCP cum Foam Fire Tender shall be fabricated and built on TATA/Ashok Leyland/MAN/Volvo/Eicher/Bharat Benz/Mercedez Benzchassis (BS III/applicable emission norms in that region) with power steering and GVW 16 ton to be bought by the vendor on behalf of GAIL (India) Limited after placement of P.O. New chassis manufacturing recently (not more than six month old from the date of order) shall be used for fire tender fabrication. Offered chassis details to be submitted with bid.

3.1 The chassis shall be supplied with tool kit, spare wheel assembly with tyre (arrangement shall be made to fit on the tender), hydraulic jack etc.

3.2 All wiring shall be properly fixed in position and shall be protected against heat, oil and physical damage. All wiring shall pass through PVC sleeves/ conduits and to be distributed through distribution box. Lighting shall be provided for cabin, lockers, roofs, panels and other required area in addition to normal vehicle lighting. Wiring shall be colour coded or marked suitably at junction/terminator. Wiring shall be rated for more than 120 % of rated load and shall have minimum voltage drop/electrical losses. Circuit shall be suitably protected against over current, overheat.

3.3 Extra Leaf springs (as per load) shall be provided at rear, if required.

3.4 All important electrical circuits shall have separate fuses suitably indicated and grouped in a common fuse box located in an easily accessible position in the driver cabin.

3.5 Drag hook or eye of adequate strength & design shall be provided at the rear & front of the chassis. One towing hitch shall be provided at rear portion for towing minimum one tonne trailer.

4.0 Pump:

The DCP cum Foam Fire Tender shall be mounted with multi pressure (normal & high) centrifugal type pump of Firefly/GODIVA / Rosen Bauer make capable of delivering capable of delivering 3000-4000 LPM (based on the site requirement) @ 8.5 kg/cm2 approx. at 3 M lift & 300 LPM or higher at 35 kg/cm2 approx. and should be powered through the chassis engine via PTO. The Heavy duty full torque PTO unit shall be capable of transmitting power to pump by suitable propeller shaft.

4.1 Bidder shall specify the make, model of pump in the offer and send literature of pump with offer.

4.2 The suction side of the pump shall be able to connect directly to hydrant discharge outlets and also under pressure to the water tank of the tender.

4.3 The pump shall be rear mounted on the chassis and shall be accessible and readily removable for use, repair and maintenance. The pump shall have its control panel at rear.

4.4 The pump shall be of rigid construction and shall be made of Gun metal / light alloy compatible with fire fighting water and foam compound with stainless steel shaft suitable for use with saline water. The pump impeller shaft shall be carried in antifriction bearings.

4.5 The pump’s impeller neck rings and impeller rings shall be renewable types and the gland shall be of self-adjusting type. A drain plug shall be provided at the bottom of the casing.

4.6 PRIMER: The pump shall be fitted with pump manufacturer primer. It shall be capable of lifting water at least through 7.0 meter at a rate not less than 30 cm/sec. It shall be of such design as would not lead to its mechanical failure, would be easy in maintenance and would work satisfactorily even if it has been left dry for a long period.

4.7 The delivery outlet of pump shall be connected to monitor and two numbers of screwed 63 mm delivery female outlets instantaneous type with blank caps at the rear side along with twist type lugs made of gun metal. The monitor outlets should be fitted with lever operated ball valves.

4.8 The pump shall have one suction inlet threaded type at rear side & should be provided with strainers which should be removable easily. The pump shall be able to take suction from the water tank in normal condition.
5.0 Power Take Off Unit (PTO):

5.1 The power take off unit of suitable gear ratio to match the engine & pump characteristics shall be provided.

5.2 PTO shall be operated pneumatically with push button/lever in crew cabin.

5.3 Necessary support for PTO units, propeller shaft couplings, universal joints etc shall be provided.

5.4 The drive assembly component (shaft, couplings) shall be dynamically balanced.

5.5 The details of the PTO such as its make, name of the manufacturer etc, supported with catalogue/drawing shall be submitted along with the offer.

5.6 The PTO shall be Martin Harper / Webster / VAS / Firefly make and bidder shall specify make, model of PTO with offer and sent literature with the offer.

6.0 Water Tank:

6.1 Water tank of 3000 Litres capacity shall be suitably mounted on the chassis. It shall be fabricated out of SS 316/316L plates minimum 5mm thickness for bottom and remaining plates 4mm thickness for sides & top and 3mm thickness for removable baffles. The tank should be of welded construction & should be suitably baffled. 100% radiography should be followed at butt joint and report shall be submitted during inspection and supply. The welding shall be done using GTAW with ER 316 electrode and DP shall be done at all fillet joints. The tank should have adequate SS angle reinforcement.

6.2 It shall be provided with baffles across with 450 mm manhole flange to prevent surge while the vehicle is accelerating, cornering and braking and shall be so designed and mounted as to bring the centre of gravity as low as possible in the chassis. The baffles shall be arranged in a manner to facilitate the passage of a man throughout the Tank for cleaning purposes.

6.3 The tank shall be rectangular / elliptical in shape, corrugated sheet type from sides for better strength and maximum space availability and mounted on chassis. It shall be flexible type to prevent the tanks distortion due to the chassis flexion. The mounting shall permit full contents of the tank to flow into the pump. The tank shall be mounted on the vehicle on a sub-frame. This sub-frame shall be made from anti-corrosive treated MS section and shall be bolted with the chassis using the high tensile bolts.

6.4 An inspection manhole of not less than 450 mm size shall be provided on top with hinged or removable cover and shall be marked 'WATER'.

6.5 Suitable eyes shall be provided on the shell of the tank to enable it to be lifted off the vehicle for repair/replacement as necessary.

6.6 A cleaning hole of 250 mm diameter shall be provided at the bottom of the tank. The cleaning hole shall be provided with a 25 mm dia. drain pipe with a valve and plug connection and shall be taken down to a point well below the chassis without reducing the effective ground clearance.

6.7 The tank shall be fitted with min. 50 mm. bore overflow pipes and the discharge end shall be taken below the chassis without reducing the effective ground clearance.

6.8 Tank should have following connections to facilitate the operation:

6.8.1 Hydrant – Tank (01 number on both sides).

6.8.2 Tank - Pump- Hose reels (high pressure).

6.8.3 Tank –Pump- 2 nos. delivery.

6.8.4 Tank –Pump-Monitor (Aqua foam monitor).

6.8.5 Hydrant to Hose Reel (normal pressure).

6.8.6 Pump delivery to PTO, engine radiator cooling tank and back to pump suction.

6.9 The filling connections in the tank shall be suitable dia. and shall be fitted with 63 mm inst. Male connections of SS with removable strainer & blank cap & NRV.

6.10 The tank shall be connected to the pump with a ball valve.

6.11 A water level indicator (graduated glass tube) with isolation valve shall be provided close to the pump control panel indicating Full, ⅓, ½, ¾ & empty. In addition to this an electronic/digital water tank level indicator meter shall be provided at pump panel and crew cabin. It shall be suitably illuminated, calibrated and marked.
6.12 The complete tank shall be painted with epoxy paint after thorough cleaning & surface preparation, both internally and externally after fabrication to protect against corrosion. Suitable anticorrosion treatment shall be done internally and externally of tank.

6.13 The engineering of the tank should be of good quality so as to increase the life of the tank and should be of least maintenance. The tank shall be embossed with Die Pressed stiffeners on all four sides to prevent the surges while the vehicle is accelerating, cornering and braking and shall be so designed and mounted as to bring the centre of gravity as low as possible in the chassis.

6.14 The tank should have provision to avoid vacuum and overpressure.

6.15 Apart from the above, all facility shall be as per IS: 10460 for water tank.

6.16 Material test certificate for tank material and all other relevant test certificates shall be submitted along with fire tender.

7.0 Foam Tank:

7.1 Foam Compound (for AFFF- IS: 4989 & UL-162 approved) tank of 500 litres capacity shall be mounted on the chassis. Supply of foam is not in vendor scope. However the foam required for performance and other foam system test is in vendor scope. Tank should be fabricated out of SS 316/316L plates of minimum 5 mm thickness for bottom and 4 mm thickness for sides & top and 3 mm thickness for baffles. All internal and external surfaces shall be suitably treated to resist corrosion and shall be painted. Anti corrosion treatment shall be applied internally and externally to foam tank and all lines carrying foam compound and solution.

7.2 The foam tank shall be mounted on ridged or flexible mounting pads to prevent distortion due to chassis flexion. It shall be of rigid type with welded construction and should be suitably baffled & elliptical shape, curved at bottom; corrugated type sheet at sides for better strength and maximising space availability. In addition a 2% of expansion space should be made in the tank, over & above foam compound capacity. 100% radiography should be followed at butt joint and report shall be submitted during inspection and supply. Butt weld joint to be kept as minimum. The welding shall be done using GTAW with ER 316 electrode and DP shall be done at fillet joints. The tank should have adequate SS angle reinforcement.

7.3 The foam tank shall be fitted with Die Pressed stiffeners on all four sides to prevent the surges while the vehicle is accelerating, cornering and braking and shall be so designed and mounted as to bring the centre of gravity as low as possible in the chassis. Suitable eyes shall be provided on the shell of the tank to enable it to be lifted off the vehicle for repair /replacement as necessary. The tank shall be mounted on the vehicle on a sub-frame. This sub-frame shall be made from SS 316 or MS channels (as per site condition e.g. corrosion issues in humid and coastal regions) and shall be bolted with the chassis using the high tensile bolts.

7.4 The tank shall be fitted with a sludge trap. The tank shall also have a cleaning hole of 250 mm dia. and 25 mm drain pipe with a valve and plug incorporated in it. The cleaning hole shall be flanged type and easily accessible from bottom of the vehicle. The bottom of the tank should have a slight slope towards the sludge trap.

7.5 The tank shall have a filling orifice of not less than 150 mm dia. for foam filling from top of the tank. It shall be provided with removable strainer and cap marked as 'FOAM'. An additional filling pipe connection of 50 mm dia. shall be provided with 63 mm male coupling, blank cap, NRV and lever type ball valve on rear side of the vehicle. It shall be connected to the tank at the top. It shall be marked as foam filling line, painted yellow. It shall be suitable for filling foam in foam tank from external source, even during drawing of foam from tank.

7.6 The tank shall have one number of 450 mm dia. inspection manholes with hinged or removable covers. The manhole covers shall be marked 'FOAM' at the top.

7.7 The tank shall be provided with a breather valve to avoid vacuum during drawing of foam from tank and pressurization during filling of foam in tank.

7.8 All plumbing shall be reasonably accessible for maintenance purpose. Screwed bends, joints shall be avoided as far as possible. Joints shall be of flange type and provided with suitable O rings. All the outlet and inlets to tanks shall be taken by installing nozzles of SS 316/316L and shall have suitable reinforcement pads of SS 316/316L.

7.9 The draw off line shall be connected to the foam compound proportioner / inductor and pump. The draw-off pipe shall be fitted with removable strainer and ball valve of S.S material.

7.10 Foam tank shall be tested for leakage period of 24 Hrs.
7.11 Material test certificate and all other relevant test certificates for tank shall be submitted along with fire tender.

8.0 Foam Proportioning System:

8.1 Around the pump foam proportioner/inductor type (capacity for 3%-6% induction) with selector valve should be provided between suction & delivery of the pump to induct 3%-6% foam solution in the water stream with no loss in delivery pressure from the pump. The proportioner should be so installed that it should not be liable to mechanical or other damage. The selector valve should have variable setting between ON & OFF positions. It shall be calibrated for hose & monitor operation and combination operation. Make, model and literature of foam proportioner to be submitted with offer.

8.2 Auxiliary Connection: Auxiliary connection for foam pickup tube with strainers shall be provided to enable the foam compound to be induced into the pump directly from the drums or outside source. 3 M pick up tube with 600 mm length SS 316 dip pipe & strainer shall also be provided for this purpose.

9.0 Aqua Foam Monitor:

9.1 There shall be one number of Multipurpose (Water-cum-Foam) Aqua Foam Monitor of 2500 LPM @ 7 Kg/cm2. It shall be made of SS 316 with bronze bearing/worm. It shall be provided with drain valve. Make, model & literature of offered monitor to be submitted with offer.

9.2 The monitor shall be connected through pipeline to the discharge outlet of the pump and provided with ball valve near monitor.

9.3 The monitor shall be lever operated and shall be capable of traversing through 360 degree in a horizontal plane, +45 degree & above up and -15 degree down in the vertical plane.

9.4 The horizontal throw range of water and foam at 7 Kg/cm2 pressure shall not be less than 50 and 45 mtr respectively in still air.

9.5 The monitor nozzle shall have a variation for fog pattern application, and shall design / manufacture in such a way that jet & spray shall create wind velocity in favourable wind direction.

9.6 A suitable place shall be provided for the operator to stand and operate the monitor comfortably in any direction.

10.0 Water Hose Reels:

10.1 The high pressure pump should operate through a separate hose reel of 60m length which should be provided at a suitable place on the appliance. The hose used for the hose reel shall be rated for 150 bar working pressure (200 bar test pressure) & should be of 16-19 mm ID. It shall have geared winding system. At the discharge end of the hose reel, a high-pressure fog guns capable of discharging 300 LPM @ 35 bars in jet or fog patterns, as required shall be connected. The jet range should not be less than 20 Mtrs & the water droplets in the spray form should be of approximately 300 microns at an angle of 45 degrees.

10.2 An additional 60 M first aid hose reel (braided non kinking hose IS marked) operating at normal pump pressure shall be provided along with hydrant to hose reel, pump to hose reel connection. It shall have gear operated winding system.

11.0 Cooling System (Engine and PTO)

11.1 A suitable capacity additional heat exchanger for cooling of engine coolant shall be provided. The water cooling system for PTO oil and Engine coolant heat exchanger shall be directly connected to pump discharge side.

11.2 The cooling system shall be of closed circuit type i.e. cooling water should go back to pump. It shall provide adequate cooling to PTO and engine for high efficiency during stationery and prolonged operation of fire tender. Lever operated ball valves shall be provided for cooling line flow control and draining hot water at engine coolant heat exchanger.

11.3 The heat exchanger (PTO and cooling tank for Engine Coolant) piping shall be of copper for effective cooling.

11.4 A set (02 nos. each) of flexible hoses and clamps connecting engine radiator to heat exchanger shall be supplied with fire tender.
12.0 **DCP Unit**

12.1 DCP unit shall comprise of one vessel of 1000 Kg Dry Chemical Powder, two (02) hose reels with discharge gun for DCP discharge, one DCP Monitor, necessary control systems etc. and mounted on the chassis behind the cabin. Material used for fabrication to be specified in details with precautionary measures/treatment for avoiding corrosion and suitable for high humid environment. Arrangement shall be provided to expel the powder from each of the vessels through both hose reels as well as monitor.

12.2 **DRY CHEMICAL POWDER VESSEL:** The appliance shall have one 1000kg Dry Chemical Powder (designed as per apparent density 0.6 - 0.9 gm/cc of DCP powder as per QISO-116, UL 299C) vessel. For design of vessel powder apparent/tap density of 0.80 gm/cc to be considered. The vessel volume for 1000 Kg capacity should not less than 1375 litres. The selected shell thickness (including corrosion allowance) should not be less than 16 mm. The vessel shall be designed, fabricated & inspected as per ASME Code VIII Div-I. The material for the vessel shall be as per ASME/BIS codes. The plates shall be ultrasonically tested. The DCP vessel shall be mounted on the chassis with suitable foundation arrangements. The corrosion allowance for shell & dished end should be taken as minimum 2.5 mm.

12.3 The vessel shall be treated for anti-corrosion. The vessels shall be designed for design pressure of 22 kg/sq.cm; working pressure of vessel should be 15 kg/sq.cm. The hydro test of the vessel should be done at 35 kg/sq.cm.The test certificate should be submitted with supply.

12.4 Vender shall submit the design calculations for the DCP vessel along with his bid indicating material specifications, design pressure, test pressure, radiographic requirements, adopted thickness for shell and dished end, nozzles & piping etc.

12.5 Vessels should be provided with filling aperture of 18" dia. with flanged cover at top and drain hole of 10" dia. at bottom with flanged cover. Vessel shall be fitted with safety valve, pressure gauge, pressure reducing device, isolation valve, charging valve fitted at suitable location. Vessel should be provided with a blow valve/safety valve or similar device on top to discharge N2 gas in the atmosphere without discharging powder. Blank rubber cap to be provided at monitor outlet to avoid water ingress. Manual tank pressure vent should be provided.

12.6 The DCP vessels shall be cylindrically shaped and shall be hermetically seating type cap with easy means for removing for the purpose of re-filling dry Chemical powder.

12.7 The vessels shall be provided with pressure gauge, drain plug, safety valve set at pressure of 16 kg/sq.cm.

12.8 Supply of DCP is not in vendor scope i.e. The DCP vessel shall not be provided with/filled with DCP. However a permanent marking of dry chemical powder filling height should be considered to avoid over-pressurisation of cylinder.

12.9 The DCP system (with any one vessel, both side hose line and associated accessories) shall be tested with normal DCP (PBC/ SBC/ any powder having apparent density 0.6 - 0.9 gm/cc etc.) at vendor site during inspection. The normal DCP & other consumables required for the test shall be in vendor scope.

12.10 **NITROGEN CYLINDERS:** DCP system shall have sufficient nos. of Nitrogen cylinders of 150 bar rating (however nitrogen cylinder pressure of 140 bars should be considered for hydraulic calculation and nitrogen cylinder requirement) to achieve the required pressure (15 kg/cm²), flow and discharge of minimum 95% of Dry Chemical Powder within the required time. The system shall also have minimum one spare Nitrogen cylinder for flushing of vessel, hose reel, monitor lines after the operation; however all the cylinders shall be in line. For main bank of vessel total nos. of cylinders (e.g. four nitrogen cylinders of 47-68 L depending upon hydraulic calculation) to be provided and shall be considered after taking into account a loss of 10% N2 gas due to various reasons over a period a time, and above flushing requirement over and above the operational requirement for meeting performance criteria. A hydraulic calculation for nitrogen capacity requirement meeting our performance requirement shall be submitted with offer for evaluation.

12.11 100% spare Nitrogen cylinders (stand by) shall be mounted and connected to manifold with changeover facility for ready to use.

12.12 A set (02 nos.) of suitable portable pressure measuring device with pressure releasing facility, shall be supplied with the fire tender.

12.13 The cylinder batteries shall be mounted on frame with easy & independent removal or placement of each battery. The frame shall have the anti-corrosive treatment.
12.14 Nitrogen cylinders IS 7285 marked shall be provided with valve IS-3224 marked, & should be approved by PESO (COC) Nagpur. The PESO (COC) certificate, Manufacturer test certificates (physical, chemical, hydrostatic test etc.) for N2 Cylinders shall be provided along with cylinders. The DCP vessel shall be provided with suitable device to maintain the fluidity of the powder at all times.

12.15 There shall be a separate connection to flush the DCP system (discharge pipe, hose reel, monitor etc.) with internal nitrogen pressure.

12.16 DCP HOSE REEL: Total two (02) hose reels shall be provided at easily accessible location on either side of the fire tender when one vessel is provided. The hose reel shall be quick rolling type with ball bearing. An arrangement shall be made to prevent the overrunning of the hose. Each hose reel shall be provided with 30 meter long high pressure pneumatic reinforced rubber hose of 30 mm bore fitted with trigger type pistol grip nozzle. The discharge rate of the powder shall be 2.5 Kg/Sec through each nozzle and the throw shall not be less than 10 m while working with both the hose reels.

12.17 DCP Monitor: One DCP monitor shall be mounted with the control valve on the top of the vehicle. Monitor should be rotated 360 degree in horizontal plane. Vertical movement should be adjusted to 100 degree depending upon requirement. Both movements shall be equipped with locking devices to keep the monitor locked in driving/working condition. Flow rate of powder shall be regulated in the steps of 15kg/sec., 25kg/sec. and 40kg/sec. by means of a lockable operating lever at monitor. The monitor shall be easily accessible and should have safe operating platform. The monitor shall be connected with discharge line of the DCP vessels. The discharge line shall have pneumatic control ball valves. The valves shall be operable from system nitrogen pressure with valve operation mechanism/ selector switch placed on the monitor for discharging of DCP from the vessel. The hoses used in DCP system operation shall be high pressure hoses of rating not less than 280 kg/cm2.

Material of construction for DCP monitor:

- Size: 75mm for DCP Monitor
- Body: AL Alloy/Lightweight material.
  - It should have horizontal & vertical motion manual operation.

12.18 Spares for DCP system: Spares shall be provided with material. 02 nos. of each for metal part (selector switch, pressure regulator, safety valve, manifold, coupling, pneumatic discharge valves with actuators, monitor unions, plug nuts, bends, discharge valve, pressure gauges, nitrogen cylinder pressure measuring device, hose reel nozzle) and 04 nos. of each of flexible hoses of each size/type (e.g. Cylinder to manifold, Manifold to DCP vessel etc.).

12.19 Line diagram for DCP system along with SOP shall be provided on both side of vehicle DCP system for ease of operation.

Sample calculation for Nitrogen cylinder requirement for each vessel.

Volume of vessel = 1375 Ltrs. Operating pressure = 15 Kg/cm2, DCP discharge requirement is 95 %, Nitrogen Cylinder pressure = 140 bar. So Nitrogen gas required for 95% of discharge = 0.95 x 1375 x 15 / 140 = 139.96 Ltrs. Take 10 % losses, so minimum nitrogen required is = 153.95 say 154 Ltrs. Nos. of 68 Ltrs cylinder required is = 2.26 i.e., 03 numbers. 01 nitrogen cylinder of same capacity is required for flushing operation. Hence total 04 nitrogen cylinders of 68 L WC and 150 bar rating are required for each DCP vessel. 08 nos. nitrogen to be supplied in loose quantity for fitting on vehicle if required.

13.0 Pipings

13.1 All piping should be sized so as to have minimum pressure drop and achieve the required pressure and flow at various locations.

13.2 All pipe fittings and valves should be SS 316 or cast equivalent.

13.3 All piping should be seamless and designed for 10% over the maximum pressures encountered in the pipe.

13.4 The piping should be flanged for ease of maintenance. However, flange joins kept minimum.

13.5 All lines should be hydraulically tested at 1.5 times the design pressure However, in no case should the lines be hydraulically tested below 21 kg/cm2(g).

13.6 All lines should be suitably supported so as to provide rigidity and avoid vibrations.
13.7 All lines less than 1.5” NB size can be socket welded to matching pipe rating fittings. All lines above 2” NB size should be butt welded with full penetration welds.

13.8 All gaskets in foam lines should be spiral wound with SS-316 and asbestos filler.

13.9 All bolting should be of SS-316 or cast equivalent.

13.10 The foam draw off pipe should be provided in such a manner and in such a position that sludge not pass into foam piping.

13.11 100% radiography shall be done for butt welded joints of piping. Documents shall be submitted along with appliance.

14.0 Body Work:

14.1 Enclosed accommodation shall be provided for two men in front portion of compartment including driver. Both the seats shall be independent. The driver’s seat shall be adjustable type. The rear area of compartment of driver’s cabin shall have one fixed seat for full width of cabin for crew members with back rest. Provision for fixing of PA system /base shall be in crew cabin. All seats shall have foam cushions and shall be covered with good quality Rexene. Door on either side shall be fitted with safety glasses (splinter proof) and winding type regulators. Door locking arrangement with single key operation shall be provided. The cabin floor shall be provided with 6mm rubber matting. One roof light shall be provided in the driver’s cabin. Dual sun visors and long arm outside fitting rear view mirror shall be fitted to the cab. 02 nos. wall mounted portable fans shall be provided/fitted for officer seat and driver seat. The front glass of cabin shall be single piece.

14.2 In cabin the rear removable but hinged and secured seat with good support shall have box type arrangement to accommodate battery in enclosed box, tool box, and other important equipments. Six numbers of hooks shall be provided above the rear seat at suitable height for hanging fireman suit/helmets. Arrangement to stow the two no. light weight (MOC: carbon composite) BA sets with spare cylinders in the recessed back rest of the crew member seats shall be provided with good quality snap belt fasteners in without hampering free movement in cabin and shall have easy donning facility of BA sets. Grab bar to be provided in centre of cabin for rear seat users. The seats shall be provided with seat belts.

14.3 Battery shall be placed in totally enclosed box with sealed gland for cable entry.

14.4 Installed battery of chassis shall have a charging facility from external source at its location itself.

14.5 Fabricator shall ensure that the power distribution is sufficient for all electrical equipments / devices to be used at a time. Extra battery backup may be provided if required.

14.6 Provision shall be made on dashboard for installation of VHF set with separate power supply. Supply of VHF set is not the scope of vendor.

14.7 The entire structure of the Fire Tender including that of driver’s cabin shall be a welded structure made from MS pressed sections and channels with thick aluminium sheet panelling outside. The cross members and supports channels shall be electroplated/hot dip galvanised. Fabrication shall confirm to Motor Vehicles Act & BIS. Shutter space below chassis shall be fully utilised. The DCP system and pump system to be covered with adequate sized shutters. Sufficient protection should also be given to these systems from under chassis side.

14.8 All lockers above chassis shall have Anodized Aluminium (MCD France or Fireco Italy make or equivalent) rolling type shutters. A suitable space shall be provided to keep 15 lengths of 63mm size fire hose each of 15 m length sufficient number of lockers for storage of equipments shall be provided with external access and at such height of about 1.67 mtrs. So as to be accessible from ground level. The top of lockers shall have roof, thereby providing a working platform for access to tank tops and also the roof mounted monitors. The bottom of all the lockers should be of chequered aluminium plate of 4 mm thickness fitted on the base frame to avoid bending of the plate.

14.9 All the lockers shall be fitted with internal lighting with suitably located ‘ON/OFF’ switch. A master switch for isolating the locker lighting circuit shall also be fitted in the driver’s cab.

14.10 All the lockers shall have snap coupling belt fasteners to keep equipments in its place and order.

14.11 All the lockers shall have self-drainage of all wash down water.

14.12 Grab rails (Double) and non-slip step of heavy chequered plate shall be provided to give access on both sides to the roof of the appliance and for easy and speedy removal and mounting of ladder.
14.13 A GRAND/reputed BRAND make battery operated Multitone hooters/mike with amplifier & flashing light BEACON system shall be provided. Microphone shall be provided in the driver’s cabin. One loud speaker with standard make hooters like HWOTONE hooters shall be mounted on the driver’s cabin roof. Amplifiers and microphone shall be provided in front of officer’s seat in sealed box. Light bar shall have at least three lights on each side and shall have sound range of 1 Km. It shall be protected by wire mesh.

14.14 Ladder gallows of roller type shall be provided on the roof of the vehicle for easy placing/removal of 10.5m aluminium extension ladder. There shall be suitable gallows fitted with rollers and designed to facilitate easy & quick removal of the ladder by one man from the rear of the appliance.

14.15 All electrical system including that of the chassis must be through conduits and terminals in weather proof junction box. Battery cut off switch should be provided inside cabin. All electrical circuits shall have separate fuses suitably marked and grouped in a common fuse located in an easily accessible position. Provision shall be made for minimum 04 spare fuses in the box provided in cabin. Layout drawing of entire electrical wiring shall be submitted along with fire tender.

14.16 The entire structure of appliance including that of drivers cabin shall be welded structure made from anticorrosion treated made of 14 SWG MS pressed section and channels structural steel (IS 2062) with minimum 16 SWG aluminium panelling. Complete flooring shall be of 16 SWG aluminium chequered plate. The cross members and supported channels should be zinc electroplated 50 microns for the channels ad 20 microns for supports.

14.17 The control panel of foam/water operation shall be done on aluminium sheets of 16 SWG/2 mm.

14.18 The vehicle shall be covered from Top with 3 mm chequered plate having rainwater channel at both side. The openings for equipments shall be sealed properly to ensure no water goes inside. Lockers, roof joints shall be sealed properly to avoid water ingress and corrosion.

14.19 The complete vehicle including the chassis shall be coated with best quality anti corrosive treatment/paint.

14.20 Strong grab rails shall be provided at the rear of vessel for access to top of vehicle and foot bards shall be covered with 3 mm aluminium chequered plates.

14.21 No part of bodywork shall reduce road clearance to less than 36 cm nor increase the overall width more than 2.50 m.

14.22 All spares as per Annexure-A shall have proper place in the tender. These spares shall have firm fixing arrangement. Placement of spares shall not disturb while Tender is accelerating, braking or moving on the poor road conditions. All these spares shall be easily accessible and shall have arrangement to remove them easily.

15.0 Control Panel:

15.1 The appliance shall have separate control panel for water/foam and DCP system operation.

15.2 Separate panel for water/foam system adequately illuminated shall be provided at rear side of appliance. All controls of the system shall be spaced properly and marked for easy operation. No valve shall be of wheel type.

15.3 For DCP system adequate illuminated operation control shall be provided on both side of appliance in a proper interior covered with shutter. Panel shall include PG for expellant gas cylinder and PG to indicate DCP vessel pressure.

15.4 All controls of the system shall be spaced properly and marked for easy operation. All valves shall be of lever operated type & shall be made of SS with Teflon seats.

15.5 Line diagram for Water and Foam system along with SOP shall be provided in rear of vehicle near rear pump operation panel/pump.

15.6 All other controls like electrical siren, PA system shall be provided at the driver’s cabin. All control panels shall have clearly written operating instruction plate. Adequately illuminated operating panels shall include the following:

a. Auxiliary throttle control for the engine.

b. Pump pressure gauge.

c. Hydrant connection for water tank filling pipes on either sides.

d. Delivery outlets of the pump along with the control levers and blank cap with chain.
e. Suction inlet of pump with blank cap & chain.
f. Control for using auxiliary foam pick-up tube.
g. Foam tank isolation valve control.
h. Foam proportioner valve control.
i. Electronic gauges for foam and water level in addition to normal tube gauges.
j. Pump suction — water tank isolating valve control.
k. Foam filling facility (external filling) and control.
l. Water and foam tank level indication of the graduated glass tube with isolating cock valve (suitable protected) type or other suitable type shall be provided.
m. Lighting for control panel illumination.
n. Operating instruction plate; & flushing out instruction plate.
o. Pump RPM meter for shaft speed.
p. Control for flushing out foam equipments & piping.
q. Compound Gauge.
r. Valve of Hose reels.
s. Drain valves.
t. All pressure gauges shall be made of SS dial and needles to be immersed in fluid.

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.

15.7 The dashboard panel in the driver’s cabin should have:

In addition to chassis manufacturer features following should be provided at dashboard.
a) Siren switch.
b) Foam and water level electronic gauges (bar type). This is in addition to tube gauges provided at rear side of vehicle.
c) Rear view camera display screen.
d) PA system control panel.
e) Foam, Water, & DCP system flow diagram.
f) PTO push button for engagement of PTO pneumatically. It should be labelled properly and protected with casing/box.
g) Master switch for batteries to be provided in driver cabin.

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.

16.0 Workmanship and Finish:

16.1 The standard of workmanship and finish of all mechanical and other parts should be such that the parts normally required to be replaced can be easily & conveniently replaced and fitted correctly.

16.2 Workmanship executed shall be of highest quality and order. All rivets & bolts shall have a coat of approved paint on both surfaces before riveting or bolting, welding. All steel screws, bolts, nuts. Studs, rivets etc. shall be zinc coated or shall have rust proof coats by a recognized process. All the material used material used in the fabrication of the body work shall be of good quality or approved make and type. All equipment and material shall comply with the requirements of the latest relevant IS specifications.

16.3 All the lockers and rear pump compartment shall be covered with extruded aluminium roller shutter of reputed make of best quality. Roller shutter shall be water tight when closed. The roller shutter shall be durable, maintenance free, weather & corrosion resistant. Guide rail shall support the shutter over entire length. The extruded aluminium roller shutter shall be powder coated/anodized to a smooth finish and aesthetic view. The
16.4 If required, lower lockers shall be provided with flap type doors opening downwards. Heavy duty chain and hinges shall be provided on these doors so that these doors can be used as climbing step for access to upper lockers. Adequate grab handles shall be provided in upper lockers at convenient height for easy access.

16.5 Arrangement for keeping 04 numbers suction hoses shall be provided with suitable supports at convenient location.

16.6 All the portable equipments over top of the vehicle shall be provided with suitable bag/cover for protection from rain dust etc.

16.7 The equipments shall be covered by aluminium panelling from outside.

16.8 The gross vehicle weight of the Fire Tender with all equipments, consumable & crew should be approximately 85% of permissible axle load of chassis manufacturer’s specification. The weight distribution diagram, equipment layout shall be submitted along with the offer.

17.0 Painting & Marking:

17.1 The entire appliance shall be painted in ‘Red’ IS: 5 SHADE NO: 536, 0.12 to 0.2 mm thickness, using double coat spray painting on the outside. The paint shall conform to IS: 2932. The painting process shall be performed as:
   a) each primer capable of passivating the metal and ensuring adequate adhesion for subsequent coat to a dry film thickness (DFT) of 6 microns shall first be applied.
   b) Acrylic polyurethane based sealer / primer shall be applied to a DFT of 40 microns to guarantee and excellent gloss hold out, chip resistance and uniform base colour shall be the second coat.
   c) Top Coat- Two coats of lead free, chromate free acrylic polyurethane shall be applied providing excellent coverage and durability.

17.2 On either side of the Vehicle Logo of ‘GAIL’ and ‘GAIL (India) Limited’ monogram and "DCP cum Foam Tender" shall be affixed (radium/HDPE sticker) in contrast colour at suitable places bilingually.

17.3 The driver's compartment shall be laminated and the inside of lockers shall be painted cream. Lockers shall be finished in shadow board painting to show the position of each pieces of equipment.

17.4 The chassis and wheel arches shall be painted black.

17.5 All the water pipings shall be painted Red (fire red) and all the foam lines shall be painted Yellow and all DCP lines shall be painted blue.

17.6 Two coats of anticorrosion paint and one zinc phosphate priming coat shall be applied before painting of Fire tender including chassis.

17.7 For, all water fittings like Branch Pipes etc. Quick Release type couplings are provided which enables the operator to locate the desired equipment instantly and thereby save valuable time at the time of fire. These Couplings also ensure that none of the items damage the internal panelling and thereby increase the life of the vehicle. Suitable clamps, brackets, holders etc. are provided for all other items.

17.8 Identification of each equipment placed in the Tender, shall be marked in a Brass/AL plate near the placement of the equipment.

17.9 The vehicle shall be clearly and permanently marked with the following, preferably on a metal plate attached in the driver's cabin and also near pump operating control panels:
   a) Manufacturer's name or trade mark.
   b) Year of Manufacture.
   c) Capacity of Pump in l/min., water tank and foam tank in litres.
   d) Engine and chassis number.
   e) All instrument controls shall be identified with name plates
   f) All hoses & valves inlet & outlet shall also be identified by suitable name plates.

18.0 Spares:

Following Foam, water DCP system spares shall be provided along with fire tender:

a. Valve of all type / sizes = 02 nos. each.
b. Cap along with stud-nut–bolts for manhole of water tank, foam tank = 01 each.
c. Drain cap with nut-bolts of water tank, foam tank and DCP vessels = 02 each.
d. Safety valve for DCP vessel = 02 nos. for each vessel and other spares as given in 12.18.
e. All type pressure gauge = 02 nos. for each type.
f. Landing valves (spare) = 04 nos.
g. All type spares of landing valve (gland nut, spindle, wheel, washer, chuck nut, nut & bolts, L V sheet, gasket) = 04 nos. each.
h. All size / type of NRV = 02 nos. each size/type.
i. Required spares for monitors = 02 nos. each.
j. Spares for water/foam pump: mechanical seals, shaft sleeves, bearing, gaskets, glands and other consumables: 02 numbers/sets of each.
k. Two tool boxes as given in annexure-C

19.0 **Accessories:**

The DCP cum Foam Fire Tender shall also be provided with the following accessories in addition to those normally fitted to the chassis. All the accessories shall be suitably fixed in position or shall be kept in lockers or other suitable place as on the tender. Electrical fittings shall be weather proof & equipment should be ISI marked.

19.1 Electrically operated siren - 01 No. 12 V with range 1 km. to be mounted externally on Top. Make: Kheraj/Philips.
19.2 Fog lamps powered by the battery of the Vehicle, these shall be low mounted in front of the vehicle - 02 Nos.
19.3 Reversing lights - 04 Nos., suitably situated to assist reversing.
19.4 Blinker type traffic indicators - 02 Sets.
19.5 Twin colored revolving light with beacon on top & blinker light on rear side- 01 Set, cabin roof mounted (Lukas or some other standard make).
19.6 Good quality Search light with halogen bulb with 100 mtrs. length of cable having 100 watt luminescent with tripod etc. complete - 01 Set.
19.7 An adjustable spotlight - 01 No.
19.8 Portable Inspection Lamp with brackets to be clamped to the battery-01 No.
19.9 All tools of standard make required for normal routine maintenance of the Fire Tender & Emergency Work (Carpenter, Electrical & Engg tools box), which are not included with the kit of the chassis – 01 complete Set each.
19.10 Removable CCOE/PESCO Approved spark arrestor fitted to the exhaust of the engine - 01 no. CCOE Certificate required at the time of supply.
19.11 Wind screen wipers (Electrically operated of approved design) if not provided with the chassis.
19.12 Public address system : (Philips or Ahuja make) Battery operated with a control panel in driver's cabin shall be provided. One loud speaker shall be mounted on driver's cabin roof. The range shall be 1 KM in still air and 500 mtrs. in noisy areas.
List of Equipments as per ANNEXURE "A“ attached with this specification and other equipment confirming to specify respective IS shall be provided.

20.0 **Acceptance Tests (Fire Tender):**

Following tests shall be carried out before accepting the vehicle at manufacturer's workshop / site to the complete satisfaction of owner's inspector without any extra cost.

20.1 The design of the Tender shall be such that it should not affect the chassis characteristics as specified by the chassis manufacture such as speed, turning circle, acceleration, breaking efficiency with appliance fully loaded, etc.

20.2 The pump shall run for a continuous period of minimum 4 hours at the rated capacity mentioned earlier. During test the temp. of engine should not exceed the rated temp & that of lube oil 79 degrees C.
20.3 The priming device shall be tested with a vertical lift of 7.0 M measured from water level to the centre of suction eye of the pump at a rate of not less than 30 cm/sec.

20.4 The monitor and hand lines, separately and in combination as mentioned earlier shall be tested for delivering water/foam at their rated capacity and horizontal range as mentioned in this specification.

20.5 Foam making equipment shall be applied to check the induction ratio of foam compound, total foam discharge rate and expansion ratio of foam production using the foam compound.

20.6 All the piping shall be tested to a hydrostatic test pressure of 18.0 Kg/cm² for a min. period of 2 hrs.

20.7 Water and Foam tank shall be tested for leakage after fabrication before applying any paint. The tanks shall be kept full with water and shall be observed for 24 hrs for any leakage.

20.8 The stability of the appliance shall be such that when under fully equipped and laden condition, if the surface on which the appliance stands is tilted to either side, the point at which the overturning occurs is not passed at an angle of 27 ½° from horizontal.

20.9 Quality of material of vessel and thickness of vessel plate shall be inspected and stamped by a recognised third party, inspectors and shall be produced at the time of 2nd stage inspection.

20.10 Performance test of the DCP system with hose reels and monitor as per specifications. During checking of DCP system, the ordinary dry chemical powder (IS marked) may be used which shall be in vendor scope.

20.11 Gradient of appliance shall be tested on the test ramp which has an angle/ rise slope of 1m in every 4m of distance travelled.

21.0 Documents/information Required From Vendors:

21.1 Bidder shall submit following with offer, Non submission of the same shall lead to Technical Rejection of the Offer:

21.1.1 The basic layout of the tender as per requirement.

21.1.2 Fire Tender test facilities at vendor site.

21.1.3 Individual flow diagram of DCP system, Foam & water system of Fire tender.

21.1.4 Load distribution calculation (laden & un-laden weight, total load on axle to be approximately 85% of the rated load capacity of axles).

21.1.5 Layout drawing showing the detailed engineering of Water tank, Foam tank, DCP Vessel and associated system as per our specifications listed in this tender.

21.1.6 Design calculation of DCP vessel, dish ends etc. along with nitrogen cylinder capacity calculation shall be submitted as per our requirement.

21.1.7 Electric load calculation.

21.1.8 Documents required (with offer) as mentioned in the specification.

21.2 After award of order following documents are to be submitted before fabrication for approval of GAIL:

21.2.1 Detailed Flow diagram of the appliance (Indicating pipe sizes).

21.2.2 Quality Assurance Plan.

21.2.3 Plan and elevation of the appliance showing various equipment.

21.2.4 Pump characteristics & performance curves with the pump working on hydrant & the Water tank, with manufacturer catalogues & model no. etc.

21.2.5 Design calculations for water, foam & DCP vessel indicating material specifications, design pressure, adopted thickness for shell, dish end & radiographic.

21.2.6 Line diagram showing all piping and valve etc.

21.2.7 Line diagram of all electrical circuits.

21.2.8 Catalogues & technical details for all major parts like Pump, PTO, Chassis, Hose reel, Monitor, BA set, valves and fittings, brought out items with model no. to be sent along with offer and supply.

21.2.9 All relevant test certificates and approval shall be submitted along with supply.
21.3 On placement of order, vendor shall submit the stage wise inspecting plan for approval of GAIL. Job shall be undertaken after receipt of approval from GAIL. Inspection will be carried out by GAIL/GAIL appointed TPI or both:

First stage : Inspection of chassis at vendor’s site. Construction of under-structure, Water, Foam tanks and DCP vessel. Documents related to Quality of material of vessel / tanks and thickness of vessel plate / tanks, radiography inspected and stamped by recognised third party inspector shall be produced at the time of 2nd stage inspection.

Second stage : Placement of all tanks, fittings, lockers, pump, quality of fabrication, checking of anticorrosion 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.

21.4 Technical Documents to be supplied by bidder along with the appliance:

21.4.1 Operation & maintenance manual along with parts list-Six sets.
21.4.2 All technical literature of major brought out items-Six sets.
21.4.3 Original/transparencies after incorporating the as built information shall be got signed by the GAIL Inspection engineer before submitting to GAIL for records-Six sets.
21.4.4 Final drawings as described in above-Six sets.
21.4.5 Import documents for imported equipments (if any)-Six sets.
21.4.6 ISI Mark Certificate and CCE approval certificate for Extinguisher, Nitrogen, CO2 cylinders etc.-1 Copy Each.
21.4.7 Radiography & Test certificate of Water, Foam tanks and DCP vessels, pipe welding, safety valve etc.-1 Copy each.
21.4.8 Calibration certificate of pressure safety valve, pressure gauge.
21.4.9 Hydro test certificate of DCP vessel, hose reels, hoses, piping & fittings etc.
21.4.10 All relevant test certificates of tanks and vessel as per QAP.
21.4.11 02 sets of soft copies of all above mentioned documents shall be supplied in addition to hard copy.

21.5 Manufacturer’s declaration for tanks:
Leakage if observed in the tanks within 3 years of supply due to design / manufacturing / material defects shall be rectified by the supplier free of cost. The confirmation from bidder for the same shall be given in writing along with the bid and supply.

21.6 Insurance, road tax & permanent registration:
All the documents shall be prepared with beneficiary as GAIL (India) Ltd. Bidder shall arrange for all insurance liabilities, RTO documentation, statutory payment (road tax, registration, fitness, PUC etc.) at respective state RTO including transit period i.e. from the time of chassis is taken over by the bidder from /its Authorized Dealer for fabrication of Fire Tender complete in all respect till the time it is accepted by GAIL after delivery at Site.

For chassis, copy of all relevant documents e.g. insurance, registration, road tax payment and other RTO payment shall be handed over to GAIL site by bidder immediately after buying/taking over of chassis from /its Authorized Dealer.

The bidder has to submit the following documents at the time of delivery of vehicle with beneficiary as GAIL (India) Ltd. Bidder shall renew the documents to meet the validity period of the documents as required at its own cost.

21.6.1 Transit insurance.
21.6.2 Comprehensive Insurance Policy from recognized Insurance Agency of Fire Tender valid for the period of one year beyond the date of acceptance of vehicle at GAIL Site
21.6.3 Road Tax Payment to RTOs (Vehicle manufacturing state RTO and RTO of GAIL Site valid for the period of one year beyond the date of acceptance of vehicle at GAIL Site.
21.6.4 Permanent registration certificate of Vehicle from GAIL site RTO shall be obtained by vendor.
22.0 Buyback of Old Fire Tender in Case of Replacement of Fire Tender as Per GAIL Policy

GAIL intent to buyback existing fire tender fabricated on ----- chassis, model: ----. Bidder may see the fire tender and fully evaluate the fire tender on its own before quoting the rate of new fire tender. Bidder is required to quote for new fire tender and is also required to take back the old fire tender, in its then state/condition, and manner as given below:

22.1 Bidder shall not quote separate price for old fire tender.
22.2 Bidder is required to quote the bid price after taking into account the value of old fire tender. The details of old fire tender are given in technical specification of tender (Annexure----).
22.3 All taxes, duties, documentation and other expenditure required and incurred in taking the buyback of old fire tender from GAIL, Site is in vendor’s scope. No invoice should be generated from GAIL; however the bidder shall pay all the taxes and duties as decided by the RTO.

Bidder should not sell the old fire tender to any of the GAIL employees or his family member as per GAIL Rules.

23.0 Bidder shall confirm the point wise specification, deviation if any should be mentioned clearly.

24.0 Signature & seal of bidder:

Annexure-A
Schedule of Equipments to be stowed in the Appliance

<table>
<thead>
<tr>
<th>SN</th>
<th>ITEM</th>
<th>QTY (NOS.)</th>
<th>Vendor Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Dehivery hose, non percolating flexible, yellow/red colour, ISI marked IS: 636, Type-B as per IS:636, 63mm dia and 15mtr. Length</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Suction hose of PVC/Rubber 100 mm int. dia in  2.5 mt. length fitted with 100 mm Suction Hose Couplings (IS 902-1974 2ND Rev.)</td>
<td>04</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Three Way Suction Collecting Head 100 mm Size (IS904-1965 2ND REV.)</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Suction Wrenches for 100 mm Suction Couplings (IS 4643)</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Suction Strainer 100 mm size (IS-907-1965)</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Basket Strainer (Cylinder Type)(IS3582-1966)</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Dividing Breaching with Control Inst. Pattern (ISS131)</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Collecting Breaching Inst. pattern 63 mm.</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Fog Nozzle with extension applicator with fog head</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Inline foam inductor (225 lpm)</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Akron / Elkart make Multi-gallonage, multipurpose firefighting nozzles of lightweight aluminum/pyrolight, 750 lpmor above flow with at least 4 flo setting from 300-750 lpmor upper range without shutoff. It shall have spinning teeth of hard plastic/SS 316, jet range: 35-40 m at 7 bar. It should have jet, spary/fog pattern and should be provided with shut off valve. It shall conform to NFPA-1964 or latest rev.</td>
<td>04</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>TP branches, revolving branch (Al alloy/SS) (02 of each)</td>
<td>04</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>NRV Spanner (for NRV hydrant to tank water inlet)</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Adaptor for 100 mm suction female screw coupling and 63 mm male instantaneous (As per IS903-1975 2ND Rev.)</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td>Item</td>
<td>Description</td>
<td>Quantity</td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>----------</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Adaptor Double female Inst. Pattern 63 mm (As per IS903-1975 2ND Rev.)</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Adaptor Double male Inst. Pattern 63 mm (As per IS903-1975 2ND Rev.)</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Water curtain (SS)</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Fireman axe (as per IS)</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Intrinsically safe torch (LED) Wolflite/Pelican with minimum 120 lumen, area classifications rating for Zone-0 application (IEC/ATEX/UL approved).</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Intrinsically safety rechargeable hand lamp (LED) Wolflite/Pelican with minimum light output of 350 lumen, area classifications rating for Zone-1 application (IEC/ ATEX / UL approved).</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Portable fire extinguisher DCP, 09 Kg SP type (ISI marked), ABC Type</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Portable CO2 fire ext., 4.5 Kg.(ISI marked &amp; CCEO approved)</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Foam making Branch FB-5 &amp; FB-10 with pick up tube (IS 2097)</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Lowering line-50 mm circumference hemp or terylene or PP, 40 m long Having 2 ends spliced in &amp; 01 end with a running Nose (IS 1084-1969)</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Long line-50 mm circumference manila/PP-30 m long (IS1084-1969)</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Short line-50 mm circumference manila/PP-15 m long(IS1084-1969)</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>First Aid Box for 10 person (Contents as per Factory Act)</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Crow Bar (IS704-1968)</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>Sledge Hammer, 6.5 Kg (IS841-1968)</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Spanner, adjustable, 30 cm long handle (IS6169)</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>Door Breaker</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>Hydraulic Jack-7.5 tonnes (in addition to that provided with chassis kit)</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>Fire Hook (IS 927-1964)</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>Fire beater (IS 1931-1972)</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>Lock Cutter</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>BA set as per our enclosed specs. in annexure 'B'</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>10.5 m Al, Extension Ladder as per IS-4571</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>Standard LPG Tanker leakage handling kit.</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>39</td>
<td>Water gel blanket / burn shield blanket CE marked, size: 6FTX6FT</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>Hose Ramp (hose ramp for 02 nos. 63 mm delivery hose) (1 set-02 nos.)</td>
<td>02 set</td>
<td></td>
</tr>
<tr>
<td>41</td>
<td>Tool kit as per enclosed specifications in Annexure 'C'</td>
<td>02 set</td>
<td></td>
</tr>
<tr>
<td>42</td>
<td>Electric motor operated barrel type foam transfer Pump of reputed. (MOC of body, shaft, rotor impeller: SS 316, Discharge: 40-50 lpm approx. at discharge head 5 M) from foam drum/barrel to foam tank (as per site requirement).</td>
<td>01</td>
<td></td>
</tr>
</tbody>
</table>
| 43   | Non sparking tools (Beryllium free Aluminum Bronze alloy) :  
  - Brass Hammer, size: 02kg = 01 no.  
  - Double open end Spanners (Size: 19x22, 24x27, 26x27, 30x32) = 02 no. each.  
  - Hack saw blade (OAL – 300mm) = 05nos.  
  - Hack – saw Frame (OAL- 540mm) = 01no.  
  Tools shall be of Mekaster / Snapon / Hindustan Everest / Hebei Boton or Equivalent make only                                                                 |          |
| 44   | All the above items 1 to 40 should be confirming to relevant IS and as specified in relevant item description. All above said items shall be placed and fixed in vehicle with proper holders, clamps etc. Bidder shall confirm the point wise specification, deviation if any should be mentioned clearly. |          |

**Signature & seal of bidder:**
Annexure-B  
Specifications of BA set as per GAIL PPE specification  
(Site Should add the specification of BA Set)  

Annexure-C  
Description of Ordinary Hand Tools

<table>
<thead>
<tr>
<th>SN</th>
<th>Description of Material (in each tool box)</th>
<th>Qty. of Tools (in each tool box)</th>
<th>Vendor Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Set of pipe wrench of sizes: - 8&quot;, 10&quot;, 12&quot;, 14&quot;, 18&quot;, 24&quot;, 36&quot;.</td>
<td></td>
<td>01 each</td>
</tr>
<tr>
<td>2.</td>
<td>Double open end spanner (set of 6 mm to 32 mm) 6x7, 8x9, 10x11, 12x13, 14x15, 16x17, 18x19, 20x22, 21x23, 22x24, 24x26, 24x27, 25x28, 30x32</td>
<td>01 Set</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Ring spanner set (06 mm to 32 mm) 6x7, 8x9, 10x11, 12x13, 14x15, 16x17, 18x19, 20x22, 21x23, 24x26, 24x27, 25x28, 30x32 (Total 13 Nos.)</td>
<td>01 Set</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Adjustable slide wrench (04 Nos.) (150 mm, 200, 250 mm &amp; 300 mm)</td>
<td>01 each</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Allen keys (in L' shape) &amp; (size in MM) 1.5, 2, 2.5, 3, 04, 05, 06, 07, 08, 09, 10 &amp; 12 (12 Nos.)</td>
<td>01 each</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Combination pliers (02 nos.) 1.50 mm &amp; 200 mm.</td>
<td>01 each</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Flat file (02 Nos.) 150 mm &amp; 200 mm.</td>
<td>01 each</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Half round file (200 mm).</td>
<td>01 No.</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Hack saw frame with handle (for 12&quot; long blade) along with 10 Nos. of blades.</td>
<td>01 Set</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Screw drivers (in mm) 04 Nos. 50x3, 100x4, 125x6, 150x8.</td>
<td>01 each</td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>Oil Can 1/2 pint capacity.</td>
<td>01 No.</td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>Steel measuring tape (05 meter long).</td>
<td>01 No.</td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>Nose plier 150 mm.</td>
<td>01 No.</td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>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.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td>Note: Tools shall be of Taparia / Jhalani / Everestmake.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Bidder shall confirm the point wise specification, deviation if any should be mentioned clearly.

Signature & seal of bidder:
Specifications of DCP cum Foam Fire Tender
(As per guidelines of IS: 10460 & IS 10993 or latest IS)

1.0 Scope:

The Multi purpose Water cum Foam cum DCP Tender including all accessories should be designed & manufactured as per BIS / ISI and sound engineering practice. All the equipments & accessories should be fixed on the appliance in a compact & neat manner & should be so placed that each part is easily & readily accessible for use and maintenance. (Indicative layout of DCP cum Foam Fire Tender is given in Annexure-E for illustration purpose).

This specification covers the general requirements regarding materials performance and acceptance tests for DCP cum Foam Fire tender to be used for Fire Fighting. The scope of supply shall be inclusive of but not limited to the following:

1.1 Chassis having 25 tons GVW (BS III/applicable emission norms in that region) with power steering having payload capacity of more than 18 tonnes (approx. for fire tender construction) to be bought by vendor on behalf of GAIL (India) Ltd. Manufacturing of Chassis must be latest, not more than 06 months old from the date of PO.

1.2 A Multi pressure (normal & high) Centrifugal type pump of CE marked Firefly/Goédia /Rosenbauer make capable of delivering 3000-4000 LPM (based on the site requirement) @ 8.5 kg/cm².

1.3 A Heavy duty full torque Power Take Off Unit of Martin Harper / Webster / VAS / Firefly MAKE capable of transmitting power for driving the Pump with above features.

1.4 A stainless steel (SS-316/316L- based on site requirement) Water tank of 3000 ltrs. Capacity.

1.5 A stainless steel Foam Tank (SS-316/316L) of 2000 ltrs.capacity.

1.6 A aqua foam monitor of not less than 2500 LPM @ 7.0 Kg/CM²

1.7 A first aid and high pressure Hose Reel of 60 Mtrs length.

1.8 DCP unit: There shall be two vessels of 1000 Kgs each (i.e. 1000kg Main + 1000kg-stby) DCP capacity (DCP as per OISD 116 &UL listed/approved 299C) and vessel shall be designed considering apparent density of the powder. It should be provided with 02 nos. hose reel of 30 Mtrs on either side of vehicle, manual override pneumatic control valve.

1.9 Expellant gas system having nitrogen gas in cylinders with 100% spare cylinders with change-over facility.

1.10 A battery operated amplifier system, rear view camera with visual display in crew cabin to be provided.

1.11 Control panels.

1.12 Single compartment driver cabin of seating capacity six (02 front independent seats and 04 at rear bench type) with arrangement for keeping BA set, fireman suits and other tools in box, fixed/hinged lockers type arrangement.

1.13 15 nos. of synthetic hose (yellow/red colour) of 15 mtr. Length with SS couplings, type B, IS: 636 Marked as mentioned in Annexure A.

1.14 02 nos. light weight 6.8-6.9 L WC, 300 bar, Dragger/MSA/Scott/Honeywell make B.A Set, with 02 nos. spares cylinder as per EN 137: 2006 Type II as per attached specification in Annexure B.

1.15 Piping, necessary controls, hose lines and other accessories, Complete accessories as per ANNEXURE-A, & as per requirement listed in this tender document.

2.0 General:

2.1 The DCP cum Foam Fire Tender including all accessories shall be designed for oil and gas fire application and manufactured as per relevant Indian Standards and as per sound engineering practice. All valves shall be of lever operated ball valves type except of any other type of valves mentioned anywhere else in the specification.

2.2 The specification mentioned here under lays down the requirements regarding material, design, construction, workmanship and finish, accessories and acceptance test of Fire Tender.

2.3 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.

2.4 All material/equipment shall be BIS marked & where BIS is not specified / not available the material shall be of high quality from reputed manufacturer. The vendor shall be responsible for supplying all equipment/accessories and properly fixing them on the chassis as described in this specification. Other details & requirements which are not covered under this specification, but may be necessary to complete the Fire Tender and/or to fulfil the operation/performance requirement shall be provided by the vendor, who should be responsible for the design & construction of the complete appliance to the full satisfaction of the Owner (GAIL).

3.0 Chassis:

The DCP cum Foam Fire Tender shall be fabricated and built on TATA/Ashok Leyland/Man/Volkswagen/Eicher/Bharat Benz/Mercedez Benz chassis (BS III/applicable emission norms in that region) with power steering, superstructure (fire tender) payload capacity of 18 tonnes (approx.) to be bought by the vendor on behalf of GAIL (India) Limited after placement of P.O. New chassis manufacturing recently (not more than six month old from the date of order) shall be used for fire tender fabrication. Offered chassis details to be submitted with bid.

3.1 The chassis shall be supplied with tool kit, spare wheel assembly with tyre (arrangement shall be made to fit on the tender), hydraulic jack etc.

3.2 All wiring shall be properly fixed in position and shall be protected against heat, oil and physical damage. All wiring shall pass through PVC sleeves/ conduits and to be distributed through distribution box. Lighting shall be provided for cabin, lockers, roofs, panels and other required area in addition to normal vehicle lighting. Wiring shall be colour coded or marked suitably at junction/terminator. Wiring shall be rated for more than 120% of rated load and shall have minimum voltage drop/electrical losses. Circuit shall be suitably protected against overcurrent, overheat.

3.3 Extra Leaf springs (as per load) shall be provided at rear, if required.

3.4 All important electrical circuits shall have separate fuses suitably indicated and grouped in a common fuse box located in an easily accessible position in the driver cabin.

3.5 Drag hook or eye of adequate strength & design shall be provided at the rear & front of the chassis. One towing hitch shall be provided at rear portion for towing minimum one tonne trailer.

4.0 Pump:

The DCP cum Foam Fire Tender shall be mounted with multi pressure (normal & high) centrifugal type pump of Firefly/GODIVA / RosenBauer make capable of delivering capable of delivering 3000-4000 LPM (based on the site requirement) @ 8.5 kg/cm2 approx. at 3 M lift & 300 LPM at 35 kg/cm2 approx. and should be powered through the chassis engine via PTO. The Heavy duty full torque PTO unit shall be capable of transmitting power to pump by suitable propeller shaft.

4.1 Bidder shall specify the make, model of pump in the offer and send literature of pump with offer.

4.2 The suction side of the pump shall be able to connect directly to hydrant discharge outlets and also under pressure to the water tank of the tender.

4.3 The pump shall be rear mounted on the chassis and shall be accessible and readily removable for use, repair and maintenance. The pump shall have its control panel at rear.

4.4 The pump shall be of rigid construction and shall be made of Gun metal / light alloy compatible with fire fighting water and foam compound with stainless steel shaft suitable for use with saline water. The pump impeller shaft shall be carried in antifriction bearings.

4.5 The pump's impeller neck rings and impeller rings shall be renewable types and the gland shall be of self-adjusting type. A drain plug shall be provided at the bottom of the casing.

4.6 PRIMER: The pump shall be fitted with pump manufacturer primer. It shall be capable of lifting water at least through 7.0 meter at a rate not less than 30 cm/sec. It shall be of such design as would not lead to its mechanical failure, would be easy in maintenance and would work satisfactorily even if it has been left dry for a long period.

4.7 The delivery outlet of pump shall be connected to monitor and four numbers of screwed 63 mm delivery female outlets instantaneous type with blank caps at the rear side along with twist type lugs made of gun metal. The
monitor outlets should be fitted with lever operated ball valves.

4.8 The pump shall have one suction inlet threaded type at rear side & should be provided with strainers which should be removable easily. The pump shall be able to take suction from the water tank in normal condition.

5.0 Power Take Off Unit (PTO):

5.1 The power take off unit of suitable gear ratio to match the engine & pump characteristics shall be provided.

5.2 PTO shall be operated pneumatically with push button/lever in crew cabin.

5.3 Necessary support for PTO units, propeller shaft couplings, universal joints etc shall be provided.

5.4 The drive assembly component (shaft, couplings) shall be dynamically balanced.

5.5 The details of the PTO such as its make, name of the manufacturer etc, supported with catalogue/ drawing shall be submitted along with the offer.

5.6 The PTO shall be Martin Harper / Webster / VAS / Firefly make and bidder shall specify make, model of PTO with offer and sent literature with the offer.

6.0 Water Tank:

6.1 Water tank of 3000 Litres capacity shall be suitably mounted on the chassis. It shall be fabricated out of SS 316/316L plates minimum 5 mm thickness for bottom and remaining plates 4 mm thickness for sides & top and 3 mm thickness for removable baffles. The tank should be of welded construction & should be suitably baffled. 100% radiography should be followed at butt joint and report shall be submitted during inspection and supply. The welding shall be done using GTAW with ER 316 electrode and DP shall be done at all fillet joints. The tank should have adequate SS angle reinforcement.

6.2 It shall be provided with baffles across with 450 mm manhole flange to prevent surge while the vehicle is accelerating, cornering and braking and shall be so designed and mounted as to bring the centre of gravity as low as possible in the chassis. The baffles shall be arranged in a manner to facilitate the passage of a man throughout the Tank for cleaning purposes.

6.3 The tank shall be rectangular / elliptical in shape, corrugated sheet type from sides for better strength and maximising space availability and mounted on chassis. It shall be flexible type to prevent the tanks distortion due to the chassis flexion. The mounting shall permit full contents of the tank to flow into the pump. The tank shall be mounted on the vehicle on a sub-frame. This sub-frame shall be made from anti-corrosive treated MS section and shall be bolted with the chassis using the high tensile bolts.

6.4 An inspection manhole of not less than 450 mm size shall be provided on top with hinged or removable cover and shall be marked ‘WATER’.

6.5 Suitable eyes shall be provided on the shell of the tank to enable it to be lifted off the vehicle for repair / replacement as necessary.

6.6 A cleaning hole of 250 mm diameter shall be provided at the bottom of the tank. The cleaning hole shall be provided with a 25 mm dia. drain pipe with a valve and plug connection and shall be taken down to a point well below the chassis without reducing the effective ground clearance.

6.7 The tank shall be fitted with min. 50 mm. bore overflow pipes and the discharge end shall be taken below the chassis without reducing the effective ground clearance.

6.8 Tank should have following connections to facilitate the operation:

6.8.1 Hydrant — Tank (01 number on both sides).

6.8.2 Tank — Pump — Hose reels (high pressure).

6.8.3 Tank — Pump — 4 nos. deliveries.

6.8.4 Tank — Pump — Monitor (Aqua foam monitor).

6.8.5 Hydrant to Hose Reel (normal pressure).

6.8.6 Pump delivery to PTO, engine radiator cooling tank and back to pump suction.

6.9 The filling connections in the tank shall be suitable dia. and shall be fitted with 63 mm inst. Male connections of SS with removable strainer & blank cap & NRV.
6.10 The tank shall be connected to the pump with a ball valve.

6.11 A water level indicator (graduated glass tube) with isolation valve shall be provided close to the pump control panel indicating Full, ¾, ½, ¼ & empty. In addition to this an electronic/digital water tank level indicator meter shall be provided at pump panel and crew cabin. It shall be suitably illuminated, calibrated and marked.

6.12 The complete tank shall be painted with epoxy paint after thorough cleaning & surface preparation, both internally and externally after fabrication to protect against corrosion. Suitable anticorrosion treatment shall be done internally and externally of tank.

6.13 The engineering of the tank should be of good quality so as to increase the life of the tank and should be of least maintenance. The tank shall be embossed with Die Pressed stiffeners on all four sides to prevent the surges while the vehicle is accelerating, cornering and braking and shall be so designed and mounted as to bring the centre of gravity as low as possible in the chassis.

6.14 The tank should have provision to avoid vacuum and overpressure.

6.15 Apart from the above, all facility shall be as per IS: 10460 for water tank.

6.16 Material test certificate for tank material and all other relevant test certificates shall be submitted along with fire tender.

7.0 Foam Tank:

7.1 Foam Compound (for AFFF- IS: 4989 & UL-162 approved) tank of 2000 litres capacity shall be mounted on the chassis. Supply of foam is not in vendor scope. However the foam required for performance and other foam system test is in vendor scope. Tank should be fabricated out of SS 316/316L plates of minimum 5 mm thickness for bottom and 4 mm thickness for sides & top and 3 mm thickness for baffles. All internal and external surfaces shall be suitably treated to resist corrosion and shall be painted. Anticorrosion treatment shall be applied internally and externally to foam tank and all lines carrying foam compound and solution.

7.2 The foam tank shall be mounted on ridged or flexible mounting pads to prevent distortion due to chassis flexion. It shall be of rigid type with welded construction and should be suitably baffled & elliptical shape, curved at bottom; corrugated type sheet at sides for better strength and maximising space availability. In addition a 2% of expansion space should be made in the tank, over & above foam compound capacity. 100% radiography should be followed at butt joint and report shall be submitted during inspection and supply. Butt weld joint to be kept as minimum. The welding shall be done using GTAW with ER 316 electrode and DP shall be done at fillet joints. The tank should have adequate SS angle reinforcement.

7.3 The foam tank shall be fitted with Die Pressed stiffeners on all four sides to prevent the surges while the vehicle is accelerating, cornering and braking and shall be so designed and mounted as to bring the centre of gravity as low as possible in the chassis. Suitable eyes shall be provided on the shell of the tank to enable it to be lifted off the vehicle for repair / replacement as necessary. The tank shall be mounted on the vehicle on a sub-frame. This sub-frame shall be made from SS 316 or MS channels (as per site condition e.g. corrosion issues in humid and coastal regions) and shall be bolted with the chassis using the high tensile bolts.

7.4 The tank shall be fitted with a sludge trap. The tank shall also have a cleaning hole of 250 mm dia. and 25 mm drain pipe with a valve and plug incorporated in it. The cleaning hole shall be flanged type and easily accessible from bottom of the vehicle. The bottom of the tank should have a slight slope towards the sludge trap.

7.5 The tank shall have a filling orifice of not less than 150 mm dia. for foam filling from top of the tank. It shall be provided with removable strainer and cap marked as 'FOAM'. An additional filling pipe connection of 50 mm dia. shall be provided with 63 mm male coupling, blank cap, NRV and lever type ball valve on rear side of the vehicle. It shall be connected to the tank at the top. It shall be marked as foam filling line, painted yellow. It shall be suitable for filling foam in foam tank from external source, even during drawing of foam from tank.

7.6 The tank shall have one number of 450 mm dia. inspection manholes with hinged or removable covers. The manhole covers shall be marked 'FOAM' at the top.

7.7 The tank shall be provided with a breather valve to avoid vacuum during drawing of foam from tank and pressurization during filling of foam in tank.

7.8 All plumbing shall be reasonably accessible for maintenance purpose. Screwed bends, joints shall be avoided as far as possible. Joints shall be of flange type and provided with suitable O rings. All the outlet and inlets to tanks
shall be taken by installing nozzles of SS 316/316L and shall have suitable reinforcement pads of SS 316/316L.

7.9 The draw off line shall be connected to the foam compound proportioner / inductor and pump. The draw-off pipe shall be fitted with removable strainer and ball valve of S.S material.

7.10 Foam tank shall be tested for leakage period of 24 Hrs.

7.11 Material test certificate and all other relevant test certificates for tank shall be submitted along with fire tender.

8.0 Foam Proportioning System:

8.1 Around the pump foam proportioner/inductor type (capacity for 3%-6% induction) with selector valve should be provided between suction & delivery of the pump to induct 3%-6% foam solution in the water stream with no loss in delivery pressure from the pump. The proportioner should be so installed that it should not be liable to mechanical or other damage. The selector valve should have variable setting between ON & OFF positions. It shall be calibrated for hose & monitor operation and combination operation. Make, model and literature of foam proportioner to be submitted with offer.

8.2 Auxiliary Connection: Auxiliary connection for foam pickup tube with strainers shall be provided to enable the foam compound to be induced into the pump directly from the drums or outside source. 3 M pick up tube with 600 mm length SS 316 dip pipe & strainer shall also be provided for this purpose.

9.0 Aqua Foam Monitor:

9.1 There shall be one number of Multipurpose (Water-cum-Foam) Aqua Foam Monitor of 2500 LPM @ 7 Kg/cm2. It shall be made of SS 316 with bronze bearing/worm. It shall be provided with drain valve. Make, model & literature of offered monitor to be submitted with offer.

9.2 The monitor shall be connected through pipeline to the discharge outlet of the pump and provided with ball valve near monitor.

9.3 The monitor shall be lever operated and shall be capable of traversing through 360 degree in a horizontal plane, +45 degree & above up and -15 degree down in the vertical plane.

9.4 The horizontal throw range of water and foam at 7 Kg/cm2 pressure shall not be less than 50 and 45 mtr respectively in still air.

9.5 The monitor nozzle shall have a variation for fog pattern application, and shall design / manufacture in such a way that jet & spray shall create wind velocity in favourable wind direction.

9.6 A suitable place shall be provided for the operator to stand and operate the monitor comfortably in any direction.

10.0 Water Hose Reels:

10.1 The high pressure pump should operate through a separate hose reel of 60 m length which should be provided at a suitable place on the appliance. The hose used for the hose reel shall be rated for 150 bar working pressure (200 bar test pressure) & should be of 16-19 mm ID. It shall have geared winding system. At the discharge end of the hose reel, a high-pressure fog guns capable of discharging 300 LPM @ 35 bars in jet or fog patterns, as required shall be connected. The jet range should not be less than 20 Mtrs. & the water droplets in the spray form should be of approximately 300 microns at an angle of 45 degrees.

10.2 An additional 60 M first aid hose reel (braided non kinking hose IS marked) operating at normal pump pressure shall be provided along with hydrant to hose reel, pump to hose reel connection. It shall have gear operated winding system.

11.0 Cooling System (Engine and PTO)

11.1 A suitable capacity additional heat exchanger for cooling of engine coolant shall be provided. The water cooling system for PTO oil and Engine coolant heat exchanger shall be directly connected to pump discharge side.

11.2 The cooling system shall be of closed circuit type i.e. cooling water should go back to pump. It shall provide adequate cooling to PTO and engine for high efficiency during stationery and prolonged operation of fire tender. Lever operated ball valves shall be provided for cooling line flow control and draining hot water at engine coolant heat exchanger.
11.3 The heat exchanger (PTO and cooling tank for Engine Coolant) piping shall be of copper for effective cooling.

11.4 A set (02 nos. each) of flexible hoses and clamps connecting engine radiator to heat exchanger shall be supplied with fire tender.

12.0 DCP Unit

12.1 DCP unit shall comprise of two vessels of 1000 Kgs. each capacity Dry Chemical Powder, two (02) hose reels (interconnected) with discharge gun for DCP discharge, one DCP Monitor, necessary control systems etc. and mounted on the chassis behind the cabin. Material used for fabrication to be specified in details with precautionary measures/treatment for avoiding corrosion and suitable for high humid environment. Arrangement shall be provided to expel the powder from each of the vessels through both hose reels as well as monitor.

12.2 DRY CHEMICAL POWDER VESSELS: The appliance shall have two vessels of 1000 kg each Dry Chemical Powder (designed as per apparent density 0.6 - 0.9 gm/cc of DCP powder as per OISD-116, UL 299C) vessel. For design of vessel powder apparent/tap density of 0.80 gm/cc to be considered. The vessel volume for 1000 Kg capacity should not less than 1375 litres. The selected shell thickness (including corrosion allowance) should not be less than 16 mm. The vessels shall be designed, fabricated & inspected as per ASME Code VIII Div-I. The material for the vessels shall be as per ASME/BIS codes. The plates shall be ultrasonically tested. The DCP vessels shall be mounted on the chassis with suitable foundation arrangements. The corrosion allowance for shell & dished end should be taken as minimum 2.5 mm.

12.3 The vessels shall be treated for anti-corrosion. The vessels shall be designed for design pressure of 22 kg/sq.cm; working pressure of vessel should be 15 kg/sq.cm. The hydro test of the vessels should be done at 35 kg/sq.cm. The test certificate should be submitted with supply.

12.4 Vendor shall submit the design calculations for the DCP vessels along with his bid indicating material specifications, design pressure, test pressure, radiographic requirements, adopted thickness for shell and dished end, nozzles & piping etc.

12.5 Vessels should be provided with filling aperture of 18" dia. with flanged cover at top and drain hole of 10" dia. at bottom with flanged cover. Vessels shall be fitted with safety valve, pressure gauge, pressure reducing device, isolation valve, charging valve fitted at suitable location. Vessels should be provided with a blow valve/safety valve or similar device on top to discharge N2 gas in the atmosphere without discharging powder. Blank rubber cap to be provided at monitor outlet to avoid water ingress. Manual tank pressure vent should be provided.

12.6 The DCP vessels shall be cylindrically shape and shall be hermetically seating type cap with easy means for removing for the purpose of re-filling dry Chemical powder.

12.7 The vessels shall be provided with pressure gauge, drain plug, safety valve set at pressure of 16 kg/sq.cm.

12.8 Supply of DCP is not in vendor scope i.e. The DCP vessel shall not be provided with/filled with DCP. However a permanent marking of dry chemical powder filling height should be considered to avoid over-pressureisation of cylinder.

12.9 The DCP system (with any one vessel, both side hose line and associated accessories) shall be tested with normal DCP (PBC/ SBC/ any powder having apparent density 0.6 - 0.9 gm/cc etc.) at vendor site during inspection. The normal DCP & other consumables required for the test shall be in vendor scope.

12.10 NITROGEN CYLINDERS: DCP system shall have sufficient nos. of Nitrogen cylinders of 150 bar rating (however nitrogen cylinder pressure of 140 bars should be considered for hydraulic calculation and nitrogen cylinder requirement) to achieve the required pressure (15 kg/cm2), flow and discharge of minimum 95% of Dry Chemical Powder within the required time. The system shall also have minimum one spare Nitrogen cylinder for flushing of vessel, hose reel, monitor lines after the operation; however all the cylinders shall be in line. For main bank of vessel total nos. of cylinders (e.g. four nitrogen cylinders of 47-68 L depending upon hydraulic calculation) to be provided and shall be considered after taking into account a loss of 10% N2 gas due to various reasons over a period of time, and above flushing requirement over and above the operational requirement for meeting performance criteria. A hydraulic calculation for nitrogen capacity requirement meeting our performance requirement shall be submitted with offer for evaluation.

12.11 100% spare Nitrogen cylinders (stand by) shall be mounted and connected to manifold with changeover facility for ready to use.
12.12 A set (02 nos.) of suitable portable pressure measuring device with pressure releasing facility, shall be supplied with the fire tender.

12.13 The cylinder batteries shall be mounted on frame with easy & independent removal or placement of each battery. The frame shall have the anti-corrosive treatment.

12.14 Nitrogen cylinders IS 7285 marked shall be provided with valve IS-3224 marked, & should be approved by PESO (CCE) Nagpur. The PESO (CCE) certificate, Manufacturer test certificates (physical, chemical, hydrostatic test etc.) for N2 Cylinders shall be provided along with cylinders. The DCP vessel shall be provided with suitable device to maintain the fluidity of the powder at all times.

12.15 There shall be a separate connection to flush the DCP system (discharge pipe, hose reel, monitor etc.) with internal nitrogen pressure.

12.16 DCP HOSE REEL: Total two (02) hose reels shall be provided at easily accessible location on either side of the fire tender. Both the hose reels shall be connected with common manifold. The hose reels shall be quick rolling type with ball bearing. An arrangement shall be made to prevent the overrunning of the hose. Each hose reel shall be provided with 30 meter long high pressure pneumatic reinforced rubber hose of 30 mm bore fitted with trigger type pistol grip nozzle. The discharge rate of the powder shall be 2.5 Kg/Sec through each nozzle and the throw shall not be less than 10 m while working with both the hose reels.

12.17 DCP Monitor: One DCP monitor shall be mounted with the control valve on the top of the vehicle. Monitor should be rotated 360 degree in horizontal plane. Vertical movement should be adjusted to 100 degree depending upon requirement. Both movements shall be equipped with locking devices to keep the monitor locked in driving/working condition. Flow rate of powder should be regulated in the steps of 15kg/sec., 25kg/sec. and 40kg/sec. by means of a lockable operating lever at monitor. The monitor shall be easily accessible and should have safe operating platform.

The monitor shall be connected with discharge line of the DCP vessels. The discharge line shall have pneumatic control ball valves. The valves shall be operable from system nitrogen pressure with valve operation mechanism/ selector switch placed on the monitor for discharging of DCP from the vessel. The hoses used in DCP system operation shall be high pressure hoses of rating not less than 280 kg/cm².

Material of construction for DCP monitor:

- **Size**: 75mm for DCP Monitor
- **Body**: AL Alloy/Lightweight material.

It should have horizontal & vertical motion manual operation.

12.18 Spares for DCP system: Spares shall be provided with material. 02 nos. of each for metal part (selector switch, pressure regulator, safety valve, manifold, coupling, pneumatic discharge valves with actuators, monitor unions, plug nuts, bends, discharge valve, pressure gauges, nitrogen cylinder pressure measuring device, hose reel nozzle) and 04 nos. of each of flexible hoses of each size/type (e.g. Cylinder to manifold, Manifold to DCP vessel etc.).

12.19 Line diagram for DCP system along with SOP shall be provided on both side of vehicle DCP system for ease of operation.

Sample calculation for Nitrogen cylinder requirement for each vessel.

Volume of vessel = 1375 Ltrs. Operating pressure = 15 Kg/cm², DCP discharge requirement is 95 %, Nitrogen Cylinder pressure = 140 bar. So Nitrogen gas required for 95% of discharge = 0.95 x 1375 x 15 / 140 = 139.96 Ltrs. Take 10 % losses, so minimum nitrogen required is = 153.95 say 154 Ltrs. Nos. of 68 Ltrs cylinder required is = 2.26 i.e. 03 numbers. 01 nitrogen cylinder of same capacity is required for flushing operation. Hence total 04 nitrogen cylinders of 68 L WC and 150 bar rating are required for each DCP vessel.08 nos. nitrogen to be supplied in loose quantity for fitting on vehicle if required.

### 13.0 Pipings

13.1 All piping should be sized so as to have minimum pressure drop and achieve the required pressure and flow at various locations.

13.2 All pipe fittings and valves should be SS 316 or cast equivalent.

13.3 All piping should be seamless and designed for 10% over the maximum pressures encountered in the pipe.
13.4 The piping should be flanged for ease of maintenance. However, flange joints kept minimum.
13.5 All lines should be hydraulically tested at 1.5 times the design pressure. However, in no case should the lines be hydraulically tested below 21 kg/cm²(g).
13.6 All lines should be suitably supported so as to provide rigidity and avoid vibrations.
13.7 All lines less than 1.5” NB size can be socket welded to matching pipe rating fittings. All lines above 2” NB size should be butt welded with full penetration welds.
13.8 All gaskets in foam lines should be spiral wound with SS-316 and asbestos filler.
13.9 All bolting should be of SS-316 or cast equivalent.
13.10 The foam draw off pipe should be provided in such a manner and in such a position that sludge not pass into foam piping.
13.11 100% radiography shall be done for butt welded joints of piping. Documents shall be submitted along with appliance.

14.0 Body Work:

14.1 Enclosed accommodation shall be provided for two men in front portion of compartment including driver. Both the seats shall be independent. The driver’s seat shall be adjustable type. The rear area of compartment of driver’s cabin shall have one fixed seat for full width of cabin for crew members with back rest. Provision for fixing of PA system/base shall be in crew cabin. All seats shall have foam cushions and shall be covered with good quality Rexene. Door on either side shall be fitted with safety glasses (splinter proof) and winding type regulators. Door locking arrangement with single key operation shall be provided. The cabin floor shall be provided with 6mm rubber mating. One roof light shall be provided in the driver’s cabin. Dual sun visors and long arm outside fitting rear view mirror shall be fitted to the cab. 02 nos. wall mounted portable fans shall be provided/fitted for officer seat and driver seat. The front glass of cabin shall be single piece.

14.2 In cabin the rear removable but hinged and secured seat with good support shall have box type arrangement to accommodate battery in enclosed box, tool box, and other important equipments. Six numbers of hooks shall be provided above the rear seat at suitable height for hanging fireman suit/helmets. Arrangement to stow the two no. light weight (MOC: carbon composite) BA sets with spare cylinders in the recessed back rest of the crew member seats shall be provided with good quality snap belt fasteners in without hampering free movement in cabin and shall have easy donning facility of BA sets. Grab bar to be provided in centre of cabin for rear seat users. The seats shall be provided with seat belts.

14.3 Battery shall be placed in totally enclosed box with sealed gland for cable entry.
14.4 Installed battery of chassis shall have a charging facility from external source at its location itself.
14.5 Fabricator shall ensure that the power distribution is sufficient for all electrical equipments / devices to be used at a time. Extra battery backup may be provided if required.
14.6 Provision shall be made on dashboard for installation of VHF set with separate power supply. Supply of VHF set is not the scope of vendor.
14.7 The entire structure of the Fire Tender including that of driver’s cabin shall be a welded structure made from MS pressed sections and channels with thick aluminium sheet panelling outside. The cross members and supports channels shall be electroplated/hot dip galvanised. Fabrication shall confirm to Motor Vehicles Act & BIS. Shutter space below chassis shall be fully utilised. The DCP system and pump system to be covered with adequate sized shutters. Sufficient protection should also be given to these systems from under chassis side.
14.8 All lockers above chassis shall have Anodized Aluminium (MCD France or Fireco Italy make or equivalent) rolling type shutters. A suitable space shall be provided to keep 15 lengths of 63 mm size fire hose each of 15 m length sufficient number of lockers for storage of equipments shall be provided with external access and at such height of about 1.67 mtrs. So as to be accessible from ground level. The top of lockers shall have roof, thereby providing a working platform for access to tank tops and also the roof mounted monitors. The bottom of all the lockers should be of chequered aluminium plate of 4 mm thickness fitted on the base frame to avoid bending of the plate.
14.9 All the lockers shall be fitted with internal lighting with suitably located ‘ON/OFF’ switch. A master switch for isolating the locker lighting circuit shall also be fitted in the driver’s cab.
14.10 All the lockers shall have snap coupling belt fasteners to keep equipments in its place and order.

14.11 All the lockers shall have self-drainage of all wash down water.

14.12 Grab rails (Double) and non-slip step of heavy chequered plate shall be provided to give access on both sides to the roof of the appliance and for easy and speedy removal and mounting of ladder.

14.13 A GRAND/reputed BRAND make battery operated Multitone hooters/mike with amplifier & flashing light BEACON system shall be provided. Microphone shall be provided in the driver’s cabin. One loud speaker with standard make hooters like HWOTONE hooters shall be mounted on the driver’s cabin roof. Amplifiers and microphone shall be provided in front of officer’s seat in sealed box. Light bar shall have at least three lights on each side and shall have sound range of 1 Km. It shall be protected by wire mesh.

14.14 Ladder gallows of roller type shall be provided on the roof of the vehicle for easy placing/removal of 10.5m aluminium extension ladder. There shall be suitable gallows fitted with rollers and designed to facilitate easy & quick removal of the ladder by one man from the rear of the appliance.

14.15 All electrical system including that of the chassis must be through conduits and terminals in weather proof junction box. Battery cut off switch should be provided inside cabin. All electrical circuits shall have separate fuses suitably marked and grouped in a common fuse located in an easily accessible position. Provision shall be made for minimum 04 spare fuses in the box provided in cabin. Layout drawing of entire electrical wiring shall be submitted along with fire tender.

14.16 The entire structure of appliance including that of drivers cabin shall be welded structure made from anticorrosion treated made of 14 SWG MS pressed section and channels structural steel (IS 2062) with minimum 16 SWG aluminium panelling. Complete flooring shall be of 16 SWG aluminium chequered plate. The cross members and supported channels should be zinc electroplated 50 microns for the channels ad 20 microns for supports.

14.17 The control panel of foam /water operation shall be done on aluminium sheets of 16 SWG/2 mm.

14.18 The vehicle shall be covered from Top with 3 mm chequered plate having rainwater channel at both side. The openings for equipments shall be sealed properly to ensure no water goes inside. Lockers, roof joints shall be sealed properly to avoid water ingress and corrosion.

14.19 The complete vehicle including the chassis shall be coated with best quality anti corrosive treatment/paint.

14.20 Strong grab rails shall be provided at the rear of vessel for access to top of vehicle and foot bards shall be covered with 3 mm aluminium chequered plates.

14.21 No part of bodywork shall reduce road clearance to less than 36 cm nor increase the overall width more than 2.50m.

14.22 All spares as per Annexure-A shall have proper place in the tender. These spares shall have firm fixing arrangement. Placement of spares shall not disturb while Tender is accelerating, braking or moving on the poor road conditions. All these spares shall be easily accessible and shall have arrangement to remove them easily.

15.0 Control Panel:

15.1 The appliance shall have separate control panel for water/foam and DCP system operation.

15.2 Separate panel for water/foam system adequately illuminated shall be provided at rear side of appliance. All controls of the system shall be spaced properly and marked for easy operation. No valve shall be of wheel type.

15.3 For DCP system adequate illuminated operation control shall be provided on both side of appliance in a proper interior covered with shutter. Panel shall include PG for expellant gas cylinder and PG to indicate DCP vessel pressure.

15.4 All controls of the system shall be spaced properly and marked for easy operation. All valves shall be of lever operated type & shall be made of SS with Teflon seats.

15.5 Line diagram for Water and Foam system along with SOP shall be provided in rear of vehicle near rear pump operation panel/pump.

15.6 All other controls like electrical siren, PA system shall be provided at the driver’s cabin. All control panels shall have clearly written operating instruction plate. Adequately illuminated operating panels shall include the following:
   a. Auxiliary throttle control for the engine.
b. Pump pressure gauge,
c. Hydrant connection for water tank filling pipes on either sides.
d. Delivery outlets of the pump along with the control levers and blank cap with chain.
e. Suction inlet of pump with blank cap & chain.
f. Control for using auxiliary foam pick-up tube.
g. Foam tank isolation valve control.
h. Foam proportioner valve control.
i. Electronic gauges for foam and water level in addition to normal tube gauges.
j. Pump suction – water tank isolating valve control.
k. Foam filling facility (external filling) and control.
l. Water and foam tank level indication of the graduated glass tube with isolating cock valve (suitable protected) type or other suitable type shall be provided.
m. Lighting for control panel illumination.
n. Operating instruction plate & flushing out instruction plate.
o. Pump RPM meter for shaft speed.
p. Control for flushing out foam equipments & piping.
q. Compound Gauge.
r. Valve of Hose reels.
s. Drain valves.
t. All pressure gauges shall be made of SS dial and needles to be immersed in fluid.

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.

15.7 The dashboard panel in the driver’s cabin should have:

In addition to chassis manufacturer features following should be provided at dashboard.

a) Siren switch.
b) Foam and water level electronic gauges (bar type). This is in addition to tube gauges provided at rear side of vehicle.
c) Rear view camera display screen.
d) PA system control panel.
e) Foam, Water, & DCP system flow diagram.
f) PTO push button for engagement of PTO pneumatically. It should be labelled properly and protected with casing/box.
g) Master switch for batteries to be provided in driver cabin.

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.

16.0 Workmanship and Finish:

16.1 The standard of workmanship and finish of all mechanical and other parts should be such that the parts normally required to be replaced can be easily & conveniently replaced and fitted correctly.

16.2 Workmanship executed shall be of highest quality and order. All rivets & bolts shall have a coat of approved paint on both surfaces before riveting or bolting, welding. All steel screws, bolts, nuts. Studs, rivets etc. shall be zinc coated or shall have rust proof coats by a recognized process. All the material used material used in the fabrication of the body work shall be of good quality or approved make and type. All equipment and material shall comply with the requirements of the latest relevant IS specifications.

16.3 All the lockers and rear pump compartment shall be covered with extruded aluminium roller shutter of reputed
make of best quality. Roller shutter shall be water tight when closed. The roller shutter shall be durable, maintenance free, weather & corrosion resistant. Guide rail shall support the shutter over entire length. The extruded aluminium roller shutter shall be powder coated/anodized to a smooth finish and aesthetic view. The roller shutter shall have mechanism to hold the shutter in partly opened condition and should not free fall.

16.4 If required, lower lockers shall be provided with flap type doors opening downwards. Heavy duty chain and hinges shall be provided on these doors so that these doors can be used as climbing step for access to upper lockers. Adequate grab handles shall be provided in upper lockers at convenient height for easy access.

16.5 Arrangement for keeping 04 numbers suction hoses shall be provided with suitable supports at convenient location.

16.6 All the portable equipments over top of the vehicle shall be provided with suitable bag/cover for protection from rain dust etc.

16.7 The equipments shall be covered by aluminium panelling from outside.

16.8 The gross vehicle weight of the Fire Tender with all equipment, consumable & crew should be approximately 85% of permissible axle load of chassis manufacturer’s specification. The weight distribution diagram, equipment layout shall be submitted along with the offer.

17.0 Painting & Marking:

17.1 The entire appliance shall be painted in 'Red' IS: 5 SHADE NO: 536,0.12 to 0.2 mm thickness, using double coat spray painting on the outside. The paint shall conform to IS: 2932. The painting process shall be performed as:
   a) each primer capable of passivating the metal and ensuring adequate adhesion for subsequent coat to a dry film thickness (DFT) of 6 microns shall first be applied. b) Acrylic polyurethane based sealer / primer shall be applied to a DFT of 40 microns to guarantee and excellent gloss hold out, chip resistance and uniform base colour shall be the second coat. c) Top Coat- Two coats of lead free, chromate free acrylic polyurethane shall be applied providing excellent coverage and durability

17.2 On either side of the Vehicle Logo of 'GAIL' and 'GAIL (India) Limited' monogram and "DCP cum Foam Tender" shall be affixed (radium/HDPE sticker) in contrast colour at suitable places bilingually.

17.3 The driver’s compartment shall be laminated and the inside of lockers shall be painted cream. Lockers shall be finished in shadow board painting to show the position of each pieces of equipment.

17.4 The chassis and wheel arches shall be painted black.

17.5 All the water piping shall be painted Red (fire red) and all the foam lines shall be painted Yellow and all DCP lines shall be painted blue.

17.6 Two coats of anticorrosion paint and one zinc phosphate priming coat shall be applied before painting of Fire tender including chassis.

17.7 For, all water fittings like Branch Pipes etc. Quick Release type couplings are provided which enables the operator to locate the desired equipment instantly and thereby save valuable time at the time of fire. These Couplings also ensure that none of the items damage the internal paneling and thereby increase the life of the vehicle. Suitable clamps, brackets, holders etc. are provided for all other items.

17.8 Identification of each equipment placed in the Tender, shall be marked in a Brass/AL plate near the placement of the equipment.

17.9 The vehicle shall be clearly and permanently marked with the following, preferably on a metal plate attached in the driver’s cabin and also near pump operating control panels:
   a) Manufacturer’s name or trade mark.
   b) Year of Manufacture.
   c) Capacity of Pump in l/min., water tank and foam tank in litres.
   d) Engine and chassis number.
   e) All instrument controls shall be identified with name plates
   f) All hoses & valves inlet & outlet shall also be identified by suitable name plates.
18.0 Spares:

Following Foam, water DCP system spares shall be provided along with fire tender:

a. Valve of all type / sizes = 02 nos. each.
b. Cap along with stud-nut–bolts for manhole of water tank, foam tank = 01 each.
c. Drain cap with nut-bolts of water tank, foam tank and DCP vessels = 02 each.
d. Safety valve for DCP vessel = 02 nos. for each vessel and other spares as given in 12.18.
e. All type pressure gauge = 02 nos. for each type.
f. Landing valves (spare) = 04 nos.
g. All type spares of landing valve (gland nut, spindle, wheel, washer, chuck nut, nut & bolts, LV sheet, gasket) = 04 nos. each.
h. All size / type of NRV = 02 nos. each size/type.
i. Required spares for monitors = 02 nos. each.
j. Spares for water/foam pump: mechanical seals, shaft sleeves, bearing, gaskets, glands and other consumables: 02 numbers/sets of each.
k. Two tool boxes as given in annexure-C.

19.0 Accessories:

The DCP cum Foam Fire Tender shall also be provided with the following accessories in addition to those normally fitted to the chassis. All the accessories shall be suitably fixed in position or shall be kept in lockers or other suitable place as on the tender. Electrical fittings shall be weather proof & equipment should be ISI marked.

19.1 Electrically operated siren - 01 No. 12 V with range 1km. to be mounted externally on Top. Make: Kheraj/Philips.
19.2 Fog lamps powered by the battery of the Vehicle, these shall be low mounted in front of the vehicle - 02 Nos.
19.3 Reversing lights - 04 Nos., suitably situated to assist reversing.
19.4 Blinker type traffic indicators - 02 Sets.
19.5 Twin colored revolving light with beacon on top& blinker light on rear side- 01 Set, cabin roof mounted (Lukas or some other standard make).
19.6 Good quality Search light with halogen bulb with 100 mtr. Length of cable having 100 watt luminescent with tripod etc. complete - 01 Set.
19.7 An adjustable spot light - 01 No.
19.8 Portable Inspection Lamp with brackets to be clamped to the battery-01 No.
19.9 All tools of standard make required for normal routine maintenance of the Fire Tender & Emergency Work (Carpenter, Electrical, &Engg tools box), which are not included with the kit of the chassis – 01 complete Set each.
19.10 Removable CCOE/PESO Approved spark arrestor fitted to the exhaust of the engine - 01 no. CCOE Certificate required at the time of supply.
19.11 Wind screen wipers (Electrically operated of approved design) if not provided with the chassis.
19.12 Public address system : (Philips or Ahuja make) Battery operated with a control panel in driver’s cabin shall be provided. One loud speaker shall be mounted on driver’s cabin roof. The range shall be 1 KM in still air and 500 mtrs. in noisy areas.

List of Equipments as per ANNEXURE “A” attached with this specification and other equipment confirming to specify respective IS shall be provided.

20.0 Acceptance Tests (Fire Tender):

Following tests shall be carried out before accepting the vehicle at manufacturer’s workshop / site to the complete satisfaction of owner’s inspector without any extra cost :
20.1 The design of the Tender shall be such that it should not affect the chassis characteristics as specified by the chassis manufacture such as speed, turning circle, acceleration, breaking efficiency with appliance fully loaded, etc.

20.2 The pump shall run for a continuous period of minimum 4 hours at the rated capacity mentioned earlier. During test the temp. of engine should not exceed the rated temp & that of lube oil 79 degrees C.

20.3 The priming device shall be tested with a vertical lift of 7.0 M measured from water level to the centre of suction eye of the pump at a rate of not less than 30cm/sec.

20.4 The monitor and hand lines, separately and in combination as mentioned earlier shall be tested for delivering water/foam at their rated capacity and horizontal range a mentioned in this specification.

20.5 Foam making equipment shall be applied to check the induction ratio of foam compound, total foam discharge rate and expansion ratio of foam production using the foam compound.

20.6 All the piping shall be tested to a hydrostatic test pressure of 18.0 Kg/cm2 for a min. period of 2 hrs.

20.7 Water and Foam tank shall be tested for leakage after fabrication before applying any paint. The tanks shall be kept full with water and shall be observed for 24 hrs for any leakage.

20.8 The stability of the appliance shall be such that when under fully equipped and laden condition, if the surface on which the appliance stands is tilted to either side, the point at which the overturning occurs is not passed at an angle of 27 ½’ from horizontal.

20.9 Quality of material of vessel and thickness of vessel plate shall be inspected and stamped by a recognised third party, inspectors and shall be produced at the time of 2nd stage inspection.

20.10 Performance test of the DCP system with hose reels and monitor as per specifications. During checking of DCP system, the ordinary dry chemical powder (IS marked) may be used which shall be in vendor scope.

20.11 Gradient of appliance shall be tested on the test ramp which has an angle/ rise slope of 1m in every 4 m of distance travelled.

21.0 Documents/information Required From Vendors:

21.1 Bidder shall submit following with offer, Non submission of the same shall lead to Technical Rejection of the Offer.

21.1.1 The basic layout of the tender as per requirement (Indicative layout of DCP cum Foam Fire Tender is given in Annexure-E for illustration purpose).

21.1.2 Fire Tender test facilities at vendor site.

21.1.3 Individual flow diagram of DCP system, Foam & water system of Fire tender.

21.1.4 Load distribution calculation (laden & un-laden weight, total load on axle to be approximately 85% of the rated load capacity of axles).

21.1.5 Layout drawing showing the detailed engineering of Water tank, Foam tank, DCP Vessel and associated system as per our specifications listed in this tender.

21.1.6 Design calculation of DCP vessel, dish ends etc. along with nitrogen cylinder capacity calculation shall be submitted as per our requirement.

21.1.7 Electric load calculation.

21.1.8 Documents required (with offer) as mentioned in the specification.

21.2 After award of order following documents are to be submitted before fabrication for approval of GAIL:

21.2.1 Detailed Flow diagram of the appliance (Indicating pipe sizes).

21.2.2 Quality Assurance Plan.

21.2.3 Plan and elevation of the appliance showing various equipment.

21.2.4 Pump characteristics & performance curves with the pump working on hydrant & the Water tank, with manufacturer catalogues & model no. etc.

21.2.5 Design calculations for water, foam & DCP vessel indicating material specifications, design pressure, adopted thickness for shell, dish end & radiographic.

21.2.6 Line diagram showing all piping and valve etc.
21.2.7 Line diagram of all electrical circuits.

21.2.8 Catalogues & technical details for all major parts like Pump, PTO, Chassis, Hose reel, Monitor, BA set, valves and fittings, brought out items with model no. to be sent along with offer and supply.

21.2.9 All relevant test certificates and approval shall be submitted along with supply.

21.3 On placement of order, vendor shall submit the stage wise inspecting plan for approval of GAIL. Job shall be undertaken after receipt of approval from GAIL. Inspection will be carried out by GAIL/GAIL appointed TPI or both:

**First stage**: Inspection of chassis at vendor’s site. Construction of under-structure, Water, Foam tanks and DCP vessel. Documents related to Quality of material of vessel / tanks and thickness of vessel plate / tanks, radiography inspected and stamped by recognised third party inspector shall be produced at the time of 2nd stage inspection.

**Second stage**: Placement of all tanks, fittings, lockers, pump, quality of fabrication, checking of anticorrosion 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.

21.4 Technical Documents to be supplied by bidder along with the appliance

21.4.1 Operation & maintenance manual along with parts list-Six sets

21.4.2 All technical literature of major brought out items-Six sets

21.4.3 Original/transparencies after incorporating the as built information shall be got signed by the GAIL Inspection engineer before submitting to GAIL for records Six sets.

21.4.4 Final drawings as described in above-Six sets

21.4.5 Import documents for imported equipments (if any)-Six sets

21.4.6 ISI Mark Certificate and CCE approval certificate for Extinguisher, Nitrogen, CO2 cylinders etc.-1 Copy Each.

21.4.7 Radiography & Test certificate of Water, Foam tanks and DCP vessels, pipe welding, safety valve etc.-1 Copyeach.

21.4.8 Calibration certificate of pressure safety valve, pressure gauge.

21.4.9 Hydro test certificate of DCP vessel, hose reels, hoses, piping & fittings etc.

21.4.10 All relevant test certificates of tanks and vessel as per QAP.

21.4.11 02 sets of soft copies of all above mentioned documents shall be supplied in addition to hard copy.

21.5 Manufacturer’s declaration for tanks:

Leakage if observed in the tanks within 3 years of supply due to design / manufacturing / material defects shall be rectified by the supplier free of cost. The confirmation from bidder for the same shall be given in writing along with the bid and supply.

21.6 Insurance, road tax & permanent registration:

All the documents shall be prepared with beneficiary as GAIL (India) Ltd. Bidder shall arrange for all insurance liabilities, RTO documentation, statutory payment (road tax, registration, fitness, PUC etc.) at respective state RTO including transit period i.e. from the time of chassis is taken over by the bidder from /its Authorized Dealer for fabrication of Fire Tender complete in all respect till the time it is accepted by GAIL after delivery at Site.

For chassis, copy of all relevant documents e.g. insurance, registration, road tax payment and other RTO payment shall be handed over to GAIL site by bidder immediately after buying/taking over of chassis from /its Authorized Dealer.

The bidder has to submit the following documents at the time of delivery of vehicle with beneficiary as GAIL (India) Ltd. Bidder shall renew the documents to meet the validity period of the documents as required at its own cost.

21.6.1 Transit insurance.

21.6.2 Comprehensive Insurance Policy from recognized Insurance Agency of Fire Tender valid for the period of one year beyond the date of acceptance of vehicle at GAIL Site.
21.6.3 Road Tax Payment to RTOs (Vehicle manufacturing state RTO and RTO of GAIL Site valid for the period of one year beyond the date of acceptance of vehicle at GAIL Site.

21.6.4 Permanent registration certificate of Vehicle from GAIL site RTO shall be obtained by vendor.

22.0 Buyback of Old Fire Tender in Case of Replacement of Fire

TENDER AS PER GAIL POLICY
GAIL intent to buyback existing fire tender fabricated on ----- chassis, model: ----. Bidder may see the fire tender and fully evaluate the fire tender on its own before quoting the rate of new fire tender. Bidder is required to quote for new fire tender and is also required to take back the old fire tender, in its then state/condition, and manner as given below:

22.1 Bidder shall not quote separate price for old fire tender.

22.2 Bidder is required to quote the bid price after taking into account the value of old fire tender. The details of old fire tender are given in technical specification of tender (Annexure----).

22.3 All taxes, duties, documentation and other expenditure required and incurred in taking the buyback of old fire tender from GAIL, Site is in vendor’s scope. No invoice should be generated from GAIL; however the bidder shall pay all the taxes and duties as decided by the RTO.
Bidder should not sell the old fire tender to any of the GAIL employees or his family member as per GAIL Rules.

23.0 Bidder shall confirm the point wise specification, deviation if any should be mentioned clearly.

24.0 Signature & seal of bidder:

Annexure-A
Schedule of Equipments to be stowed in the Appliance

<table>
<thead>
<tr>
<th>SN</th>
<th>Description of Material (in each tool box)</th>
<th>Qty. of Tools (in each tool box)</th>
<th>Vendor Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Delivery hose, non percolating flexible, yellow/red colour, ISI marked IS: 636, Type-B as per IS:636, 63 mm dia and 15 mtr. Length</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Suction hose of PVC/Rubber 100 mm int. dia in 2.5 mt. length fitted with 100 mm Suction Hose Couplings (IS 902-1974 2ND Rev.)</td>
<td>04</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Three Way Suction Collecting Head 100 mm Size (IS904-1965 2ND REV.)</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Suction Wrenches for 100 mm Suction Couplings (IS 4643)</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Suction Strainer 100 mm size (IS-907-1965)</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Basket Strainer (Cylinder Type)(IS3582-1966)</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Dividing Breaching with Control Inst. Pattern (ISS131)</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Collecting Breaching Inst. pattern 63 mm.</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Fog Nozzle with extension applicator with fog head</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Inline foam inductor (225 lpm)</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>Quantity</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>-----------------------------------------------------------------------------</td>
<td>----------</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Akron / Elkart make Multi-gallonage, multipurpose firefighting nozzles of lightweight aluminum/pyrolight, 750 lpmor above flow with at least 4 flow setting from 300-750 lpmor upper range without shutoff. It shall have spinning teeth of hard plastic/SS 316, jet range: 35-40 m at 7 bar. It should have jet, spary/fog pattern and should be provided with shut off valve. It shall conform to NFPA-1964 or latest rev.</td>
<td>04</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Gun metal Branch Pipe (IS-903-1975 2ND REV.), Water curtain (SS), TP branches, revolving branch (Al alloy/SS) (02 of each)</td>
<td>08</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>NRV Spanner (for NRV hydrant to tank water inlet)</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Adaptor for 100 mm suction female screw coupling and 63 mm male instantaneous (As per IS903-1975 2ND Rev.)</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Adaptor Double female Inst. Pattern 63 mm (As per IS903-1975 2ND Rev.)</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Adaptor Double male Inst. Pattern 63 mm (As per IS903-1975 2ND Rev.)</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Nozzle Spanners (IS:903-1975)</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Fireman axe (as per IS)</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Intrinsically safe torch (LED) Wolfite/Pelican with minimum 120 lumen, area classifications rating for Zone-0 application (IEC/ATEX/UL approved).</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Intrinsically safety rechargeable hand lamp (LED) Wolfite/Pelican with minimum light output of 350 lumen, area classifications rating for Zone-1 application (IEC/ATEX/UL approved).</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Portable fire extinguisher DCP, 09 Kg SP type (ISI marked), ABC Type</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Portable CO2 fire ext., 4.5 Kg.(ISI marked &amp; CCEO approved)</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Foam making Branch FB-5 &amp; FB-10 with pick up tube (IS 2097)</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Lowering line-50mm circumference hemp or terylene or PP, 40 m long. Having 2 ends spliced in &amp; 01 end with a running Nose (IS 1084-1969)</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Long line-50 mm circumference manila/PP-30 m long (IS1084-1969)</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Short line-50 mm circumference manila/PP-15 m long (IS1084-1969)</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>First Aid Box for 10 person (Contents as per Factory Act)</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Crow Bar (IS704-1968)</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>Sledge Hammer, 6.5 Kg (IS841-1968)</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Spanner, adjustable, 30cm long handle (IS6169)</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>Door Breaker</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>Hydraulic Jack-7.5 tonnes (in addition to that provided with chassis kit)</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Item Description</td>
<td>Quantity</td>
<td></td>
</tr>
<tr>
<td>-----</td>
<td>----------------------------------------------------------------------------------</td>
<td>----------</td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>Fire Hook (IS 927-1964)</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>Fire beater (IS 1931-1972)</td>
<td>04</td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>Lock Cutter</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>BA set as per our enclosed specs. in annexure ‘B’</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>10.5 m Al, Extension Ladder as per IS-4571</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>Standard LPG Tanker leakage handling kit.</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td>39</td>
<td>Water gel blanket / burn shield blanket CE marked, size: 6FTX5FT</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>Hose Ramp (hose ramp for 02 nos. 63 mm delivery hose)</td>
<td>02 set</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1 set-02 nos.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>41</td>
<td>Tool kit as per enclosed specifications in Annexure ‘C’</td>
<td>02 set</td>
<td></td>
</tr>
<tr>
<td>42</td>
<td>Electric motor operated barrel type foam transfer Pump of reputed. (MOC of body, shaft, rotor impeller: SS 316, Discharge: 40-50 lpm approx. at discharge head 5 M) from foam drum/barrel to foam tank (as per site requirement)</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>43</td>
<td>Non sparking tools (Beryllium free Aluminum Bronze alloy) :</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Brass Hammer, size: 02kg = 01 no.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Double open end Spanners (Size: 19x22, 24x27, 26x27, 30x32) = 02 no. each.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Hack – saw blade (OAL – 300mm) = 05 nos.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Hack – saw Frame (OAL- 540mm) = 01 no.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tools shall be of Mekaster / Snapon / Hindustan Everest / Hebei Boton or Equivalent make only</td>
<td></td>
<td></td>
</tr>
<tr>
<td>44</td>
<td>All the above items 1 to 40 should be confirming to relevant IS and as specified in relevant item description. All above said items shall be placed and fixed in vehicle with proper holders, clamps etc. Bidder shall confirm the point wise specification, deviation if any should be mentioned clearly.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Signature & seal of bidder:**
**Annexure ‘B’**

Specifications of BA set as Per GAIL PPE Specification
(Site should add the specification of BA Set)

**Annexure ‘C’**

Description of Ordinary Hand Tools

<table>
<thead>
<tr>
<th>SN</th>
<th>Description of Material (in each tool box)</th>
<th>Qty. of Tools (in each tool box)</th>
<th>Vendor Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Set of pipe wrench of sizes: - 8&quot;,10&quot;,12&quot;,14&quot;,18&quot;,24&quot;,36&quot;</td>
<td>01 each</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Double open end spanner (set of 6 mm to 32 mm) 6x7, 8x9, 10x11, 12x13, 14x15, 16x17, 18x19, 20x22, 21x23, 22x24, 24x26, 24x27, 25x28, 30x32</td>
<td>01 Set</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Ring spanner set (06 mm to 32 mm) 6x7, 8x9, 10x11, 12x13, 14x15, 16x17, 18x19, 20x22, 21x23, 24x26, 24x27, 25x28, 30x32 (Total 13 Nos.)</td>
<td>01 Set</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Adjustable slide wrench (04 Nos.) (150 mm, 200, 250 mm &amp; 300 mm)</td>
<td>01 each</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Allen keys (in L’ shape) &amp; (size in MM) 1.5, 2, 2.5, 3, 04, 05, 06, 07, 08, 09, 10 &amp; 12 (12 Nos.)</td>
<td>01 each</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Combination pliers (02 nos.) 150 mm &amp; 200 mm.</td>
<td>01 each</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Flat file (02 Nos.) 150 mm &amp; 200 mm.</td>
<td>01 each</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Half round file (200 mm).</td>
<td>01 No.</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Hack saw frame with handle (for 12&quot; long blade) along with 10 Nos. of blades.</td>
<td>01 Set</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Screw drivers (in mm) 04 Nos. 50x3, 100x4, 125x6, 150x8.</td>
<td>01 each</td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>Oil Can 1/2 pint capacity.</td>
<td>01 No.</td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>Steel measuring tape (05 meter long).</td>
<td>01 No.</td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>Nose plier 150 mm.</td>
<td>01 No.</td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>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.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td>Note: Tools shall be of Taparia / Jhalani / Everest make.</td>
<td>Bidder shall confirm the point wise specification, deviation if any should be mentioned clearly.</td>
<td></td>
</tr>
</tbody>
</table>

Signature & seal of bidder:

**Annexure ‘E’**

Indicative Layout of DCP cum foam Fire Tender on 25 TON GVW chasis

![Indicative Layout of DCP cum foam Fire Tender on 25 TON GVW chasis](image)

*Figure 1: INDICATIVE LAYOUT OF DCP CUM FOAM FIRE TENDER ON 25 TON GVW CHASIS*
Firefighting Equipments
Stored Pressure Type  
DCP Fire Extinguisher – 4/6/9 Kg Cap

1. The capacity of the extinguisher should be 4kg/ 6kg/ 9Kg.
2. The extinguisher should be as per IS 15683: 2006 (or latest revision) and ISI marked.
3. Copy of valid BIS certificate for extinguisher should be submitted with offer & supply.
4. The extinguisher should be stored pressure type, pressurized with dry Nitrogen gas.
5. A pressure gauge indicating inside pressure of the cylinder should be fitted on the extinguisher. It should be durable. The pressure gauge should also have red/green marking corresponding to the pressure requirements.
6. The extinguisher should be filled with 90% Mono Ammonium Phosphate (MAP) Dry Chemical Powder (DCP) suitable for Class: A, B, & C fire. DCP should be IS: 14609 marked.
7. Copy of valid BIS certificate for DCP, make of offered DCP should be submitted with offer.
8. IS Certificate for DCP, and 90% MAP test report from manufacturer and Government Approved Lab shall be submitted along with the supply.
9. The cylinder- inner surface should be coated with anticorrosive treatment.
10. Name of Manufacturer, IS mark, Type, Capacity, Ext Sr No. & Year of manufacturing should be permanently embossed on the body of extinguisher.
11. It should be fitted with best quality squeeze grip control valve having stopper to avoid accidental pressing of squeeze grip.
12. The hose should be fitted directly to nozzle having other end connecting to control valve. Hose should be braided rubber type having bursting pressure not less than 50 kgf/cm².
13. Suitable wall hanging arrangements should be provided in the body of each extinguisher and wall hanging clamps shall be sent with supply.
14. Performance and hydro test of sample lot of extinguishers and conformity of Dry Chemical powder shall be tested in presence of GAIL’s representative at vendor’s site. All consumable for Inspection shall be in scope of vendor.
15. Fire test shall be carried out at vendor’s site in presence of GAIL’s representative as per IS:15683 as per rated capacity.
16. Material test certificate, 90% MAP test report from manufacturer should be reviewed during inspection & shall be submitted along with supply.
17. Dry Chemical Powder shall not be more than 6 months old.
18. A sample of powder will be drawn by GAIL representative for sending to third party lab for inspection. In inspection 90% MAP content and other parameters as per relevant IS will be tested. Refer SCC for details of test.
19. Documents to be supplied at the time of delivery.
   i. BIS certificate for powder & extinguisher.
   ii. Copy of relevant material test certificate for extinguisher.
   iii. Hydro-test certificate of extinguishers.
   iv. Extinguisher performance testing certificate.
   v. Extinguisher shall pass the entire test mentioned in IS 15683:2006.

DCP-75 Kg Fire Extinguishers

1. The capacity of the extinguisher should be 25 Kg/ 50 Kg/ 75 Kg DCP (design for filling/charging dry chemical powder of density 0.9 g/ml).
2. The extinguisher should be as per IS: 10658 (Latest version) and ISI marked. A copy of valid BIS approval/license shall be submitted with the offer.
3. The extinguisher should be supplied without Powder
4. A pressure gauge for indicating pressure inside the extinguisher should be fitted on the extinguisher body in the top shell. A safety valve with set pressure of 25 Kgf/cm² shall be provided fitted on the top shell of extinguisher body.
5. The body should be cylindrical in shape and should be fabricated from mild steel sheets. The inner surface should be coated with anticorrosive treatment. Suitable drain with blank cap should be provided at the bottom of the extinguisher shell.
6. Discharge tube shall be of high pressure reinforced braided rubber hose and ISI marked. The end fitting shall be jacketed/crimped to hose. Bursting pressure of hose shall not be less than 50 kg/cm². Test certificate shall be submitted along with supply. Length of hose should be 7 M (+ 0.1M).
7. Discharge nozzle shall be made of Aluminium Alloy confirming grade 4450 of IS 617 trigger control/ball valve of SS. It shall be capable to discharge dry chemical powder as per BIS and shall be so designed as to eliminate moisture penetration.
8. The extinguisher shall be mounted on solid rubber tyres and shall have arrangement of handle for pushing / pulling the trolley. It shall have arrangement for keeping discharge hose & nozzle on the extinguisher in rolled/coiled condition without any kink.
9. Cap of extinguisher should be of stainless steel. Vent holes shall be provided in caps for releasing pressure if any during cap opening.
10. A suitable capacity CO₂ gas cylinder as expellant for satisfactory performance of extinguisher as per BIS standard shall be provided with extinguisher. It should be ISI marked and approved by CCOE should be connected to the main body by copper tubing with bursting pressure of 275 Kg/cm², and firmly clamped with body.
11. CCOE approval证书 (with refilling permission) for CO₂ cylinders shall be submitted with supply.
12. The extinguisher should be painted with fire red confirming to shade 536 of IS 5. Name of Manufacturer, Type, Capacity, Ext Sr No. & Year of manufacturing should be permanently embossed on cylindrical skirt at the bottom of extinguisher body.
13. Operating instruction shall be painted on extinguisher or a PVC sticker of ‘SOP for extinguisher’ shall be affixed on extinguisher body.
14. Material test certificates (physical, chemical, hydro test etc) should be checked at the time of Inspection and shall be submitted along with supply.
15. Performance test with DCP (any type e.g. MAP, PBC etc. with apparent density of MAP 90%) and hydro test of sample lot of extinguishers shall be carried out at vendor’s site in presence of Gail’s representative. All consumable including dry chemical powder required for Inspection shall be in the scope of vendor.

Co₂ Fire Extinguisher of Capacity 3.2 Kg/ 4.5 Kg

1. Capacity of the extinguisher shall be of 3.2 Kg/ 4.5kg.
2. The extinguisher shall be as per IS: 2878 (Latest version) and ISI marked. Copy of BIS certificate shall be submitted with offer.
3. Body of extinguishers shall be made as per IS: 7285 & CCOE approved.
4. CO₂ discharge valve should be confirming IS: 3224 & marked.
5. CCOE approval certificate for extinguishers shall be submitted along with supply.
6. CO₂ gas shall be as per IS:307. Certificate of quality conformity of CO₂ shall be submitted along with supply.
7. Discharge hose: Metal wire braided tube of minimum bursting pressure 275 kgf/cm² along with electrically non conducting horn shall be supplied.
8. Material and hydro test certificate shall be submitted along with supply.
9. Painting: each ext. shall be painted Fire red confirming to shade no. 536, IS: 5
10. Wall mounting bracket & screw shall be supplied along with extinguishers.
11. Performance test and inspection of extinguishers shall be carried out in presence of GAIL’S representative at vendor’s site.

**Co2 Fire Extinguisher of Capacity 6.5 Kg / 9 Kg / 22.5 Kg**

1. Capacity of the extinguisher shall be 6.5 Kg / 9 Kg/ 22.5 Kg.
2. The extinguisher shall be as per IS: 2878 (Latest version) and ISI marked. Copy of BIS certificate shall be submitted with offer.
3. Body of extinguishers shall be made as per IS: 7285 & CCOE approved.
4. CO2 discharge valve should be confirming IS: 3224 & marked.
5. CCOE approval certificate for extinguishers shall be submitted along with supply.
6. CO2 gas shall be as per IS:307. Certificate of quality conformity of CO2 shall be submitted along with supply.
7. Discharge hose: Metal wire braided tube of minimum bursting pressure 275 kgf/cm² along with electrically non conducting horn shall be supplied.
8. Material and hydro test certificate shall be submitted along with supply.
9. Painting: each ext. shall be painted Fire red confirming to shade no. 536, IS: 5
10. Extinguisher carrying trolley shall be supplied along with the fire extinguishers.
11. Performance test and inspection of extinguishers shall be carried out in presence of GAIL’S representative at vendor’s site.

**Hose Box**

1. The hose box shall be of Outdoor Self Standing weather proof type
2. Material:
   a. Hose box: 16 Gauge M.S. Sheet./ FRP
   b. b) Hose hook: Mild steel
   c. c) Hammer: Mild steel
3. Construction:
   a. Size of hose box: 30”X 24”X 10”
   b. Rectangular construction having two hinged doors with two panels. The front doors should be provided with transparent acrylic sheet fitted with steel frames, and having locking arrangement. The recess for key is to be covered with breakable glass. 02 nos. keys shall be provided along with each hose box.
   c. A small hammer of M.S. with G.I. chain shall be provided to the cabinet to break the glass.
   d. Two nos. brackets for mounting the hose box shall be provided and suitable holes shall be provided in brackets for bolting with channel.
   e. 02 nos. of suitable metal channel (size: 1.5mtr in length & 3” wide) for each hose box for hanging of hose box shall be provided along with hose boxes.
   f. The suitable space shall be provided to keep 01 no. branch pipe, 02 nos. Delivery Hoses 15 mtrs. long with coupling.
   g. 02 Nos. drain points should be inside the hose box to drain out the water.
4. Painting: All the hose cabinets should be painted with two coats of enamel paint of anticorrosive 'Fire Red' for process plants & yellow color for pipelines on external surfaces and white colour on the internal surfaces over two coats of zinc chromate primer.
5. Drawing of complete hose box shall be approved by GAIL’s representative before supply.
Mobile Foam Unit (capacity: 200 Liter)

1. The mobile foam trolley shall be designed for rapid one man deployment. The unit shall be made of a corrosion resistant FRP Foam tank having foam capacity of 200 liters. The foam tank shall be bright yellow colour.

2. The unit shall be equipped with followings:
   a. Light alloy variable foam inductors (0-3-6%) confirming to IS 2097 with selector valve. The Aluminum alloy inline inductor shall be suitably connected to foam tank and shall be capable of delivering 225 LPM at 7.0 Kg/cm2 pressure.
   b. Foam making branch with 63 mm SS male inst. inlet capable of delivering 225 LPM at 7.0 Kg/cm2 pressure.
   c. Provision shall be made to accommodate the 02 nos. of delivery hose (15 mt in length), FB2 foam branch & inline inductor.

3. The unit shall be mounted on noncorrosive rigid body with rubber tyre, carrying handle and caster wheel for easy deployment.

4. Suitable provision of Foam filling and drain shall be provided. These should be of corrosion resistant.

5. The distance of throw shall not be less than 16 mtrs. At 7kg/cm2

6. Operating instructions of mobile unit shall be painted/Affixed along with GAIL Logo in BOLD for easy understanding, by the vendor prior to dispatching the unit.

7. Performance test report of unit shall be submitted along with supply.

8. Material shall be accepted after satisfactory performance test at Gail sites.

9. The Unit shall be able to produce foam as follows:

<table>
<thead>
<tr>
<th>Pressure</th>
<th>Foam Water solution flow</th>
<th>Foam Production</th>
</tr>
</thead>
<tbody>
<tr>
<td>7kg/cm2</td>
<td>225 LPM</td>
<td>2250 LPM</td>
</tr>
<tr>
<td>10Kg/cm2</td>
<td>255 LPM</td>
<td>2550 LPM</td>
</tr>
</tbody>
</table>

10. Entire mobile foam unit shall be dynamically balanced.


12. Marking: Water curtain shall be clearly and permanently marked on the body:
   a. Manufacturer’s name or Trademark.
   b. Type.

13. Literature, documents: Bidder should submit catalogue/literature of offer equipment along with the offer.
    Note: Vendor must confirm the point wise specifications. Deviation, if any shall be mentioned clearly.

<table>
<thead>
<tr>
<th>SN</th>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Item description</td>
<td>Manual operated Long Range Water cum Foam Monitor, size: 6 inch</td>
</tr>
<tr>
<td>2</td>
<td>Type</td>
<td>Stand post type, manual operated</td>
</tr>
<tr>
<td>3</td>
<td>Operating Conditions</td>
<td></td>
</tr>
<tr>
<td>3.1</td>
<td>Fluid Handled</td>
<td>Water &amp; foam</td>
</tr>
<tr>
<td>3.2</td>
<td>Temperature</td>
<td>Ambient.</td>
</tr>
<tr>
<td>3.3</td>
<td>Pressure (typical at inlet base flange)</td>
<td>Max. 16.0 Kg/sq cm g, a suitable range pressure to be provided on monitor body.</td>
</tr>
<tr>
<td>3.4</td>
<td>Axis drive mechanism</td>
<td>Self-locking worm and worm gear</td>
</tr>
<tr>
<td>4</td>
<td>Monitor Body</td>
<td></td>
</tr>
<tr>
<td>4.1</td>
<td>Operation type</td>
<td>Manual operated.</td>
</tr>
<tr>
<td>4.2</td>
<td>Movements</td>
<td>Horizontal 360 degree</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Elevation +90 degree to - 15 degree or more</td>
</tr>
<tr>
<td>4.3</td>
<td>Inlet Connection</td>
<td>Size- 6” flange, ANSI B16.5, 150 rating</td>
</tr>
<tr>
<td>5</td>
<td>Nozzle</td>
<td></td>
</tr>
<tr>
<td>5.1</td>
<td>Type</td>
<td>Self-inducting/non aspirating type aqua foam nozzle variable flow having facility of making of jet, fog / spray.</td>
</tr>
<tr>
<td>5.2</td>
<td>Connection</td>
<td>Threaded/flanged</td>
</tr>
<tr>
<td>5.3</td>
<td>Induction</td>
<td>3% approx.</td>
</tr>
<tr>
<td>6</td>
<td>Performance</td>
<td></td>
</tr>
<tr>
<td>6.1</td>
<td>Nozzle pressure</td>
<td>7.0 kg/sq cm</td>
</tr>
<tr>
<td>6.2</td>
<td>Flow rate</td>
<td>2000-1500-1000 GPM, variable (US Gallon)</td>
</tr>
<tr>
<td>6.3</td>
<td>Minimum discharge range (at 30 degree)</td>
<td>1) 2000 USGPM; Horizontal Foam Throw - 70 meters; Horizontal Water Throw -75 meters,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2) 1500 USGPM: 65 &amp; 70 M respectively.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3) 1000 US GPM: 60 &amp; 65 M respectively.</td>
</tr>
<tr>
<td>7</td>
<td>Material (As below or as per UL listed/FM approved drawing MOC of monitor)</td>
<td></td>
</tr>
<tr>
<td>7.1</td>
<td>Nozzle, body, elbow</td>
<td>SS316/SS316L</td>
</tr>
<tr>
<td>7.2</td>
<td>Worn gears, worm, swivel joint</td>
<td>SS316/SS316L/Bronze/GM</td>
</tr>
<tr>
<td>7.3</td>
<td>Handle</td>
<td>SS self-locking wheel.</td>
</tr>
<tr>
<td>7.4</td>
<td>Drain valve</td>
<td>SS316/SS316L</td>
</tr>
<tr>
<td>7.5</td>
<td>Flanges</td>
<td>SS316/SS316L</td>
</tr>
<tr>
<td>8</td>
<td>Foam induction system</td>
<td>PVC tube reinforced with high tensile steel wire helix (3-4 meter length)/reinforced flexible tube/pipe; with SS dip pipe with strainer for foam induction from foam barrel / tank along with SS ball valve at foam inlet to nozzle.</td>
</tr>
<tr>
<td>9</td>
<td>Test &amp; Inspection</td>
<td>Yes</td>
</tr>
<tr>
<td>9.1</td>
<td>Dimension and workmanship</td>
<td>Yes</td>
</tr>
<tr>
<td>9.2</td>
<td>Performance test</td>
<td>Yes</td>
</tr>
<tr>
<td>9.3</td>
<td>Hydrostatic test pressure</td>
<td>Main body: 25 kg/sq. cm.</td>
</tr>
<tr>
<td>9.4</td>
<td>Approval</td>
<td>Monitor shall be UL / FM approved: Bidder shall submit UL / FM approval certificate along with the offer.</td>
</tr>
<tr>
<td>10</td>
<td>Painting</td>
<td>02 coats of fire red paint as per IS: 2932 and conforming to shade no 536 of IS: 5 or polyurethane paint/coating, over 2 coats of red oxide zinc chromate primer/single coat of aluminum paint.</td>
</tr>
<tr>
<td>11</td>
<td>Literature/Documents/ Drawing</td>
<td>Bidder should submit literature/catalogue of offer product. Drawing of UL/Listed/FM Approved monitor should be submitted with offer.</td>
</tr>
</tbody>
</table>

Bidder shall submit material test (chemical & physical) certificates along with the material.

<table>
<thead>
<tr>
<th>SN</th>
<th>Item</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Item description</td>
<td>Manual operated Long Range Water cum Foam Monitor, size: 4 inch</td>
</tr>
<tr>
<td>2</td>
<td>Type</td>
<td>Stand post type, manual operated</td>
</tr>
<tr>
<td>3</td>
<td>Operating Conditions</td>
<td></td>
</tr>
<tr>
<td>3.1</td>
<td>Fluid Handled</td>
<td>Water &amp; foam</td>
</tr>
<tr>
<td>3.2</td>
<td>Temperature</td>
<td>Ambient.</td>
</tr>
<tr>
<td>3.3</td>
<td>Pressure (typical at inlet base flange)</td>
<td>Max. 16.0 Kg/sq cm g, a suitable range pressure to be provided on monitor body.</td>
</tr>
<tr>
<td>3.4</td>
<td>Axis drive mechanism</td>
<td>Self-locking worm and worm gear</td>
</tr>
<tr>
<td>4</td>
<td>Monitor Body</td>
<td></td>
</tr>
<tr>
<td>4.1</td>
<td>Operation type</td>
<td>Manual operated.</td>
</tr>
<tr>
<td>4.2</td>
<td>Movements</td>
<td>Horizontal 360 degree Elevation+90 degree to - 15 degree or more</td>
</tr>
<tr>
<td>4.3</td>
<td>Inlet Connection</td>
<td>Size- 4” flange, ANSI B16.5, 150 rating</td>
</tr>
<tr>
<td>5</td>
<td>Nozzle</td>
<td></td>
</tr>
<tr>
<td>5.1</td>
<td>Type</td>
<td>Self inducting/non aspirating type aqua foam nozzle variable flow having facility of making of jet, fog / spray.</td>
</tr>
<tr>
<td>5.2</td>
<td>Connection</td>
<td>Threaded/flanged</td>
</tr>
<tr>
<td>5.3</td>
<td>Induction</td>
<td>3% approx.</td>
</tr>
<tr>
<td>6</td>
<td>Performance</td>
<td></td>
</tr>
<tr>
<td>6.1</td>
<td>Nozzle pressure</td>
<td>7.0 kg/sq cm</td>
</tr>
<tr>
<td>6.2</td>
<td>Flow rate</td>
<td>1000-750-500 GPM, variable (US Gallon)</td>
</tr>
<tr>
<td>6.3</td>
<td>Minimum discharge range (at 30 degree)</td>
<td>1) 1000 USGPM; Horizontal Foam Throw – 60 meters; Horizontal Water Throw– 65 meters, 2) 750 USGPM: 50 &amp; 55 M respectively. 3) 500 US GPM: 40 &amp; 45 M respectively.</td>
</tr>
<tr>
<td>7</td>
<td>Material (As below or as per UL listed/FM approved drawing MOC of monitor)</td>
<td></td>
</tr>
<tr>
<td>7.1</td>
<td>Nozzle, body, elbow</td>
<td>SS316/SS316L</td>
</tr>
<tr>
<td>7.2</td>
<td>Worn gears, worm, swivel joint</td>
<td>SS316/SS316L/Bronze/GM</td>
</tr>
<tr>
<td>7.3</td>
<td>Handle</td>
<td>SS self-locking wheel.</td>
</tr>
<tr>
<td>7.4</td>
<td>Drain valve</td>
<td>SS316/SS316L</td>
</tr>
<tr>
<td>7.5</td>
<td>Flanges</td>
<td>SS316/SS316L</td>
</tr>
<tr>
<td>8</td>
<td>Foam induction system</td>
<td>PVC tube reinforced with high tensile steel wire helix (3-4 meter length)/reinforced flexible tube/pipe; with SS dip pipe with strainer for foam induction from foam barrel / tank along with SS ball valve at foam inlet to nozzle.</td>
</tr>
<tr>
<td>9</td>
<td>Test &amp; Inspection</td>
<td></td>
</tr>
<tr>
<td>9.1</td>
<td>Dimension and workmanship</td>
<td>Yes</td>
</tr>
<tr>
<td>9.2</td>
<td>Performance test</td>
<td>Yes</td>
</tr>
<tr>
<td>9.3</td>
<td>Hydrostatic test pressure</td>
<td>Main body: 25 kg/sq. cm.</td>
</tr>
<tr>
<td>9.4</td>
<td>Approval</td>
<td>Monitor shall be UL / FM approved: Bidder shall submit UL / FM approval certificate along with the offer.</td>
</tr>
<tr>
<td>10</td>
<td>Painting</td>
<td>02 coats of fire red paint as per IS: 2932 and conforming to shade no 536 of IS: 5 or polyurethane paint/coating, over 2 coats of red oxide zinc chromate primer/single coat of aluminum paint.</td>
</tr>
<tr>
<td>11</td>
<td>Literature/Documents/ Drawing</td>
<td>Bidder should submit literature/catalogue of offer product. Drawing of UL/Listed/FM Approved monitor should be submitted with offer. Bidder shall submit material test (chemical &amp; physical) certificates along with the material.</td>
</tr>
</tbody>
</table>
# Technical Data Sheet for Stand Post Type Water Monitor

(1750/2580/3500 LPM)

<table>
<thead>
<tr>
<th>SN</th>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Item description</td>
<td>Manual operated Water Monitor, size: 63 mm/ 75mm/ 100 mm, IS: 8442 approved and marked.</td>
</tr>
<tr>
<td>2</td>
<td>Type</td>
<td>Stand post type, manual operated</td>
</tr>
<tr>
<td>3</td>
<td>Operating Conditions</td>
<td></td>
</tr>
<tr>
<td>3.1</td>
<td>Fluid Handled</td>
<td>Water.</td>
</tr>
<tr>
<td>3.2</td>
<td>Temperature</td>
<td>Ambient.</td>
</tr>
<tr>
<td>3.3</td>
<td>Pressure (typical at inlet base flange)</td>
<td>Operating pressure 7.0 Kg/sq cm g. (Minimum)</td>
</tr>
<tr>
<td>3.4</td>
<td>Axis drive mechanism</td>
<td>Swivel joint with lock</td>
</tr>
<tr>
<td>4</td>
<td>Monitor Body</td>
<td></td>
</tr>
<tr>
<td>4.1</td>
<td>Operation type</td>
<td>Manual operated.</td>
</tr>
<tr>
<td>4.2</td>
<td>Movements</td>
<td>Horizontal 360 degree</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Elevation +90 degree to - 45 degree</td>
</tr>
<tr>
<td>4.3</td>
<td>Inlet Connection</td>
<td>Size- 3&quot; for 63 mm size flange or 4&quot; for 75 mm &amp; 100 mm size flange, ANSI B16.5, 150 rating</td>
</tr>
<tr>
<td>5</td>
<td>Nozzle</td>
<td></td>
</tr>
<tr>
<td>5.1</td>
<td>Type</td>
<td>Solid Jet Nozzle.</td>
</tr>
<tr>
<td>5.2</td>
<td>Connection</td>
<td>Threaded</td>
</tr>
<tr>
<td>6</td>
<td>Performance</td>
<td></td>
</tr>
<tr>
<td>6.1</td>
<td>Nozzle pressure</td>
<td>7.0 kg/sq cm</td>
</tr>
<tr>
<td>6.2</td>
<td>Flow rate</td>
<td>1750/2580/3500 LPM for 63 mm / 75 mm / 100 mm size respectively</td>
</tr>
<tr>
<td>6.3</td>
<td>Minimum discharge range (at 30 degree)</td>
<td>Horizontal Water Throw</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1) 1750 LPM; 53 meters,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2) 2580 LPM: 60 M;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3) 3500 LPM: 64 M</td>
</tr>
<tr>
<td>7</td>
<td>Material (As below or as per IS 8442 for stainless steel construction)</td>
<td></td>
</tr>
<tr>
<td>7.1</td>
<td>Base Flange</td>
<td>Plate sheet conforming to IS 6911</td>
</tr>
<tr>
<td>7.2</td>
<td>Reducer, Elbow, Water barrel, Drain valve</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>7.3</td>
<td>Swivel Joint</td>
<td>Stainless Steel conforming to IS: 6603.</td>
</tr>
<tr>
<td>7.4</td>
<td>Lock Handle</td>
<td>Stainless Steel conforming to IS: 6603.</td>
</tr>
<tr>
<td>7.5</td>
<td>Nozzle</td>
<td>Stainless Steel conforming to IS :3444</td>
</tr>
<tr>
<td>7.6</td>
<td>Handle</td>
<td>Mild steel conforming to IS: 1732</td>
</tr>
<tr>
<td>8</td>
<td>Test &amp; Inspection</td>
<td></td>
</tr>
<tr>
<td>8.1</td>
<td>Dimension and workmanship</td>
<td>Yes</td>
</tr>
<tr>
<td>8.2</td>
<td>Performance test</td>
<td>Yes</td>
</tr>
<tr>
<td>8.3</td>
<td>Hydrostatic test pressure</td>
<td>Entire Assembly 23 kg/sq. cm.</td>
</tr>
<tr>
<td>8.4</td>
<td>Approval</td>
<td>Monitor shall be IS: 8442 approved &amp; marked: Bidder shall submit BIS approval certificate along with the offer.</td>
</tr>
<tr>
<td>9</td>
<td>Anticorrosion treatment &amp; Painting</td>
<td>Monitor shall be painted with fire red</td>
</tr>
<tr>
<td></td>
<td></td>
<td>red colour conforming to shade No. 536 of IS 5. The paint shall conform to IS 2932, over 2 coats of red oxide zinc chromate primer.</td>
</tr>
<tr>
<td>10</td>
<td>Literature/ Documents/ Drawing &amp; Marking</td>
<td>Bidder should submit literature/catalogue of offer product. Drawing of IS marked monitor should be submitted with offer. Bidder shall submit material test (chemical &amp; physical) certificates along with the material.</td>
</tr>
</tbody>
</table>
### Technical Data Sheet for Jet/Spray Water Cum Foam Monitor (1750/2580/3500 LPM)

<table>
<thead>
<tr>
<th>SN</th>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Item description</td>
<td>Manual operated Jet/Spray Water cum Foam Monitor, size: 63 mm/ 75mm/ 100 mm, IS: 8442 approved and marked</td>
</tr>
<tr>
<td>2</td>
<td>Type</td>
<td>Stand post type, manual worm gear operated</td>
</tr>
<tr>
<td>3</td>
<td>Operating Conditions</td>
<td></td>
</tr>
<tr>
<td>3.1</td>
<td>Fluid Handled</td>
<td>Water &amp; Foam</td>
</tr>
<tr>
<td>3.2</td>
<td>Temperature</td>
<td>Ambient.</td>
</tr>
<tr>
<td>3.3</td>
<td>Pressure (typical at inlet base flange)</td>
<td>Operating pressure 7.0 Kg/sq cm g.</td>
</tr>
<tr>
<td>3.4</td>
<td>Axis drive mechanism</td>
<td>Worm and worm gear with hand wheel.</td>
</tr>
<tr>
<td>4</td>
<td>Monitor Body</td>
<td></td>
</tr>
<tr>
<td>4.1</td>
<td>Operation type</td>
<td>Manual hand wheel operated.</td>
</tr>
<tr>
<td>4.2</td>
<td>Movements</td>
<td>Horizontal 360 degree&lt;br&gt;Elevation +90 degree to -45 degree</td>
</tr>
<tr>
<td>4.3</td>
<td>Inlet Connection</td>
<td>Size- 3” for 63 mm size flange or 4” for 75 mm/100 mm size flange, ANSI B16.5, 150 rating</td>
</tr>
<tr>
<td>5</td>
<td>Nozzle</td>
<td></td>
</tr>
<tr>
<td>5.1</td>
<td>Type</td>
<td>Non Air Aspirating type Jet-Spray Nozzle.</td>
</tr>
<tr>
<td>5.2</td>
<td>Connection</td>
<td>Threaded</td>
</tr>
<tr>
<td>5.3</td>
<td>Foam Expansion</td>
<td>Min- 1:3</td>
</tr>
<tr>
<td>5.4</td>
<td>Induction</td>
<td>3% approx.</td>
</tr>
<tr>
<td>6</td>
<td>Performance</td>
<td></td>
</tr>
<tr>
<td>6.1</td>
<td>Nozzle pressure</td>
<td>7.0 kg/sq cm</td>
</tr>
<tr>
<td>6.2</td>
<td>Flow rate</td>
<td>1750/2580/3500 LPM for 63 mm / 75 mm / 100 mm size respectively</td>
</tr>
<tr>
<td>6.3</td>
<td>Minimum discharge range (at 30 degree)</td>
<td>Horizontal Water Throw 1) 1750 LPM;~ 53 meters, 2) 2580 LPM: 60 M; 3) 3500 LPM: 64 M respectively.&lt;br&gt; Horizontal Foam Throw 1) 1750 LPM;~ 45 meters, 2) 2580 LPM: 50 M; 3) 3500 LPM: 55 M respectively.</td>
</tr>
<tr>
<td>7</td>
<td>Material (As below or as per IS 8442 for stainless steel construction)</td>
<td></td>
</tr>
<tr>
<td>7.1</td>
<td>Base Flange</td>
<td>Plate sheet conforming to IS 6911</td>
</tr>
<tr>
<td>7.2</td>
<td>Reducer, Elbow, Water barrel, Drain valve</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>7.3</td>
<td>Worm &amp; Worm wheel/gears</td>
<td>Grade 2/3 of IS:318 or Grade 3 of IS:304 or Stainless Steel conforming to IS:6603.</td>
</tr>
<tr>
<td>7.4</td>
<td>Jet/Spray nozzle</td>
<td>Stainless Steel conforming to IS:3444</td>
</tr>
<tr>
<td>7.5</td>
<td>Worm shaft</td>
<td>Stainless Steel conforming to IS: 6603</td>
</tr>
<tr>
<td>7.6</td>
<td>Hand wheel</td>
<td>Cast iron conforming to Grade 200 of Is 210</td>
</tr>
<tr>
<td>7.7</td>
<td>Foam control valve, foam strainer</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>8</td>
<td>Foam induction system (Jet spray nozzle)</td>
<td>PVC tube reinforced with high tensile steel (3-4 meter length) or reinforced flexible tube/pipe; with 600 mm length SS dip pipe with strainer for foam induction from foam barrel/tank along with SS foam control ball valve at foam inlet to jet spray nozzle.</td>
</tr>
<tr>
<td></td>
<td>Test &amp; Inspection</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>------------------</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Dimension and workmanship</td>
<td>Yes</td>
</tr>
<tr>
<td>9.2</td>
<td>Performance test</td>
<td>Yes</td>
</tr>
<tr>
<td>9.3</td>
<td>Hydrostatic test pressure</td>
<td>Entire Assembly 23 kg/sq. cm.</td>
</tr>
</tbody>
</table>
| 9.4 | Approval | Monitor shall be IS 8442 approved & marked:  
Flow: 1750 / 2580 / 3500 LPM for 63 mm / 75 mm / 100 mm size respectively.  
Nozzle: Non Air Aspirating type Jet-Spray Nozzle.  
Operating pressure: 07 kg/sq. cm or 100 psi.  
Bidder shall submit BIS approval certificate along with the offer. |
| 10 | Anticorrosion treatment & Painting | Monitor shall be painted with fire red colour conforming to shade No. 536 of IS:5. The paint shall conform to IS:2932, over 2 coats of red oxide zinc chromate primer/single coat of aluminum paint. |
| 11 | Literature/Documents/ Drawing & Marking | Bidder should submit literature/catalogue of offer product.  
Drawing of IS marked monitor should be submitted with offer.  
Bidder shall submit material test (chemical & physical) certificates along with the material.  
Marking: Each monitor shall be clearly and permanently marked:  
1) Manufacturer's name and Trademark.  
2) Year of manufacturing.  
3) Discharge Capacity in LPM; in addition to BIS Certification Stamp & License Number (CM/L number). |
## Technical Data Sheet for Portable Ground Monitor (1800-2400 LPM)

<table>
<thead>
<tr>
<th>SN</th>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Item description</td>
<td>Manual operated Portable Ground Water/Foam Monitor.</td>
</tr>
<tr>
<td>2</td>
<td>Type</td>
<td>Portable lightweight monitor, suitable for ground operation.</td>
</tr>
<tr>
<td>3</td>
<td>Operating Conditions</td>
<td></td>
</tr>
<tr>
<td>3.1</td>
<td>Fluid Handled</td>
<td>Water/Foam</td>
</tr>
<tr>
<td>3.2</td>
<td>Temperature</td>
<td>Ambient.</td>
</tr>
<tr>
<td>3.3</td>
<td>Pressure (typical at inlet base flange)</td>
<td>Operating pressure 7.0 Kg/sq cm g.</td>
</tr>
<tr>
<td>3.4</td>
<td>Axis drive mechanism</td>
<td>Worm &amp; Worm gears wheel operated.</td>
</tr>
<tr>
<td>4</td>
<td>Monitor Body</td>
<td></td>
</tr>
<tr>
<td>4.1</td>
<td>Operation type</td>
<td>Manual operated.</td>
</tr>
<tr>
<td>4.2</td>
<td>Movements</td>
<td>Horizontal 180 degree Elevation +80 degree</td>
</tr>
<tr>
<td>4.3</td>
<td>Inlet Connection</td>
<td>02 numbers 63 mm male instantaneous coupling inlets with NRV and ABS plastic blank caps.</td>
</tr>
<tr>
<td>5</td>
<td>Nozzle</td>
<td></td>
</tr>
<tr>
<td>5.1</td>
<td>Type</td>
<td>Lightweight jet, spray type master stream nozzle and solid jet nozzle (as spare)</td>
</tr>
<tr>
<td>5.2</td>
<td>Connection</td>
<td>Threaded to monitor body</td>
</tr>
<tr>
<td>6</td>
<td>Performance</td>
<td></td>
</tr>
<tr>
<td>6.1</td>
<td>Nozzle pressure</td>
<td>7.0 kg/sq. cm.</td>
</tr>
<tr>
<td>6.2</td>
<td>Flow rate</td>
<td>1800 LPM/ 2400 LPM at operating pressure.</td>
</tr>
<tr>
<td>6.3</td>
<td>Minimum discharge range (at 30 degree)</td>
<td>Horizontal throw- 55 M, at 07.00 kg/sq. cm. g in still</td>
</tr>
<tr>
<td>7</td>
<td>Material</td>
<td></td>
</tr>
<tr>
<td>7.1</td>
<td>Body</td>
<td>Aluminum alloy/Pyrolite/SS 316</td>
</tr>
<tr>
<td>7.2</td>
<td>Nozzle</td>
<td>Aluminum alloy/Pyrolite/SS316</td>
</tr>
<tr>
<td>8</td>
<td>Safety &amp; Stability</td>
<td></td>
</tr>
<tr>
<td>8.1</td>
<td>Safety</td>
<td>Safety stops from lift off or locking arrangement from lift off movement</td>
</tr>
<tr>
<td>8.2</td>
<td>Stability</td>
<td>Base of monitor should be provided with folding legs having carbide tips spikes and locks/brakes etc. to ensure stability in unmanned full range operating conditions.</td>
</tr>
<tr>
<td>9</td>
<td>Test &amp; Inspection</td>
<td></td>
</tr>
<tr>
<td>9.1</td>
<td>Dimension and workmanship</td>
<td>Yes</td>
</tr>
<tr>
<td>9.2</td>
<td>Performance test</td>
<td>Yes</td>
</tr>
<tr>
<td>9.3</td>
<td>Hydrostatic test pressure</td>
<td>Entire Assembly 21 kg/sq. cm.</td>
</tr>
<tr>
<td>10</td>
<td>Painting</td>
<td>Monitor shall be painted with fire red colour conforming to shade No. 536 of IS 5 or polyurethane paint/coating.</td>
</tr>
<tr>
<td>11</td>
<td>Literature/Documents/ Drawing &amp; Marking</td>
<td>Bidder should submit literature/catalogue of offer product.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bidder shall submit material test (chemical &amp; physical) certificates along with the material.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Marking: Each monitor shall be clearly and permanently marked:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1) Manufacturer’s name and Trademark.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2) Year of manufacturing.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3) Discharge Capacity in LPM.</td>
</tr>
</tbody>
</table>
# Technical Data Sheet for Oscillating Water/Foam Monitor (1000 GPM)

<table>
<thead>
<tr>
<th>SN</th>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Item description</td>
<td>Manual &amp; Automatic (Hydraulic motor) Operated Water/Foam Monitor, size: 4 inch</td>
</tr>
<tr>
<td>2</td>
<td>Type</td>
<td>Stand post type, manual operated Elevation &amp; Automatic water motor driver/Hydraulic Oscillation.</td>
</tr>
<tr>
<td>3</td>
<td>Operating Conditions</td>
<td></td>
</tr>
<tr>
<td>3.1</td>
<td>FluidHandled</td>
<td>Water/foam</td>
</tr>
<tr>
<td>3.2</td>
<td>Temperature</td>
<td>Ambient</td>
</tr>
<tr>
<td>3.3</td>
<td>Pressure (typical at base flange)</td>
<td>Mini. 3.5 Kg/sq cm g, Max. 14.0 Kg/sq cm g or higher, a suitable range inlet pressure gauge to be provided on monitor body.</td>
</tr>
<tr>
<td>3.4</td>
<td>Axis drive mechanism</td>
<td>Self-locking worm and worm gear</td>
</tr>
<tr>
<td>3.5</td>
<td>Vertical movement</td>
<td>Manual Gear operated hand wheel</td>
</tr>
<tr>
<td>3.6</td>
<td>Horizontal</td>
<td>Automatic water motor driven/hydraulic oscillation. User setting option for oscillation range selection is required to be provided on hydraulic motor along with manual override.</td>
</tr>
<tr>
<td>3.7</td>
<td>Automatic water motor gears</td>
<td>Totally enclosed gear assembly, with manual override for normal (360 degree rotation) monitor operation. Grease fitting for lubrication of gears should be provided.</td>
</tr>
<tr>
<td>4</td>
<td>Monitor Body</td>
<td></td>
</tr>
<tr>
<td>4.1</td>
<td>Operation type</td>
<td>Manual (Vertical) &amp; Automatic (horizontal) operated.</td>
</tr>
<tr>
<td>4.2</td>
<td>Movements</td>
<td>Horizontal: 0-120 degree in either direction. Elevation: +90 degree to - 45 degree</td>
</tr>
<tr>
<td>4.3</td>
<td>Inlet Connection</td>
<td>Size- 4” flange, ANSI B16.5, 150 rating</td>
</tr>
<tr>
<td>5</td>
<td>Nozzle</td>
<td></td>
</tr>
<tr>
<td>5.1</td>
<td>Nozzle</td>
<td></td>
</tr>
<tr>
<td>5.2</td>
<td>Type</td>
<td>Master stream nozzle of capacity suitable for monitor rating and having facility of making of jet, fog/spray.</td>
</tr>
<tr>
<td>5.3</td>
<td>Connection</td>
<td>Threaded/flanged</td>
</tr>
<tr>
<td>6</td>
<td>Performance</td>
<td></td>
</tr>
<tr>
<td>6.1</td>
<td>Nozzle pressure</td>
<td>7.0 kg/sq cm</td>
</tr>
<tr>
<td>6.2</td>
<td>Flow rate</td>
<td>1000 GPM (US Gallon)</td>
</tr>
<tr>
<td>6.3</td>
<td>Minimum discharge range (at 30 degree)</td>
<td>1000 US GPM- 65 M.</td>
</tr>
<tr>
<td>6.4</td>
<td>Fog curtain</td>
<td>140 degree or higher for personal protection</td>
</tr>
<tr>
<td>6.5</td>
<td>Performance requirement</td>
<td>With manual &amp; automatic mode</td>
</tr>
<tr>
<td>7</td>
<td>Material</td>
<td></td>
</tr>
<tr>
<td>7.1</td>
<td>Nozzle, body, elbow</td>
<td>SS316/SS316L/Bronze/GM</td>
</tr>
<tr>
<td>7.2</td>
<td>Worn gears, worm, swivel joint</td>
<td>SS316/SS316L/Bronze/GM</td>
</tr>
<tr>
<td>7.3</td>
<td>Handle</td>
<td>SS self-locking wheel.</td>
</tr>
<tr>
<td>7.4</td>
<td>Drain valve</td>
<td>SS316/SS316L/Bronze/GM</td>
</tr>
<tr>
<td>7.5</td>
<td>Flanges</td>
<td>SS316/SS316L/Bronze/GM</td>
</tr>
<tr>
<td>8</td>
<td>Test &amp; Inspection</td>
<td></td>
</tr>
<tr>
<td>8.1</td>
<td>Dimension and workmanship</td>
<td>Yes</td>
</tr>
<tr>
<td>8.2</td>
<td>Performance test</td>
<td>Yes</td>
</tr>
<tr>
<td>8.3</td>
<td>Hydrostatic test pressure</td>
<td>Main body: 25 kg/sq. cm. Nozzle: 25 kg/sq. cm.</td>
</tr>
<tr>
<td><strong>SN</strong></td>
<td><strong>Item</strong></td>
<td><strong>Description</strong></td>
</tr>
<tr>
<td>--------</td>
<td>-------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>1</td>
<td>Item description</td>
<td>Double outlet stand post for hydrant valves, size: 4 inch</td>
</tr>
<tr>
<td>2</td>
<td>Type</td>
<td>Stand post, double outlet, 4” inlet flange, and outlet 3” flange.</td>
</tr>
<tr>
<td>3</td>
<td>Operating Conditions</td>
<td></td>
</tr>
<tr>
<td>3.1</td>
<td>Fluid Handled</td>
<td>Water</td>
</tr>
<tr>
<td>3.2</td>
<td>Temperature</td>
<td>Ambient.</td>
</tr>
<tr>
<td>3.3</td>
<td>Pressure (typical at inlet base flange)</td>
<td>7.0 kg/cm2 to 14.0 Kg/cm2</td>
</tr>
<tr>
<td>4</td>
<td>Hydrant Stand Post</td>
<td></td>
</tr>
<tr>
<td>4.1</td>
<td>Inlet Connection</td>
<td>Size- 4” flange, ANSI B16.5, 150 rating</td>
</tr>
<tr>
<td>4.2</td>
<td>Outlet Connection</td>
<td>Two nos. Size- 3” flange, ANSI B16.5, 150 rating</td>
</tr>
<tr>
<td>4.3</td>
<td>Fittings</td>
<td>It should be supplied with complete set and numbers of stud bolts (ASTM A193 GR B7 GALV, nut (ASTM A194 GR 2H GALV) and asbestos free gasket (ASTM F 104) for both 4” and 3” flanges.</td>
</tr>
<tr>
<td>5</td>
<td>Material</td>
<td></td>
</tr>
<tr>
<td>5.1</td>
<td>Flange</td>
<td>Carbon Steel: ASTM A 105 or conforming to IS 6392 or MS IS 2062/ASTM A 105</td>
</tr>
<tr>
<td>5.2</td>
<td>Water Barrel (pipe/bend)</td>
<td>Carbon Steel: ASTM A 106 GR. B / M.S. IS: 1239 PART-II</td>
</tr>
<tr>
<td>5.3</td>
<td>Stud bolts &amp; Nuts</td>
<td>Stud bolts (ASTM A193 GR B7 GALV, Nut (ASTM A194 GR 2H GALV)</td>
</tr>
<tr>
<td>5.4</td>
<td>Gasket</td>
<td>Asbestos free gasket (ASTM F 104) for both 4” and 3 inch flanges</td>
</tr>
<tr>
<td>6</td>
<td>Test &amp; Inspection</td>
<td></td>
</tr>
<tr>
<td>6.1</td>
<td>Dimension and workmanship</td>
<td>Yes</td>
</tr>
<tr>
<td>6.2</td>
<td>Performance test</td>
<td>Yes</td>
</tr>
<tr>
<td>6.3</td>
<td>Hydrostatic test pressure</td>
<td>21 kg/sq. cm.</td>
</tr>
<tr>
<td>7</td>
<td>Painting</td>
<td>02 coats of anti-corrosive fire red paint as per IS: 2932 and conforming to shade no 536 of IS: 5 or polyurethane paint/coating, over 2 coats of red oxide zinc chromate primer/single coat of aluminum paint.</td>
</tr>
<tr>
<td>8</td>
<td>Marking</td>
<td>Stand post shall be clearly and permanently marked on the valve body:                                          1) Manufacturer’s name or Trademark, 2) Sr, No, &amp; Size, 3) Type of hydrant &amp; Year of manufacturing.</td>
</tr>
<tr>
<td>9</td>
<td>Literature/Documents/Drawing</td>
<td>Bidder should submit literature/catalogue of offer product.                                                    Drawing of double outlet stand post type hydrant should be submitted with offer.  Bidder shall submit material test (chemical &amp; physical) certificates along with the material.</td>
</tr>
</tbody>
</table>
Landing Valve for Fire Hydrant

1. The landing valve should be type A (single outlet) & IS 5290 marked.


3. Inlet should be 75 mm NB flanged inlet, PCD-152 mm, OD-200 mm, ID: 75 mm (approx.) and should be of stainless steel.

4. It should have stainless steel spindle.

5. It should have 63 mm female instantaneous, oblique type outlet.

6. It should be complete with ABS plastic blank cap, MS/GI chain attached to body, and MS/CI Hand wheel.

7. Lug Assembly should be twist type lugs and it should be made up of stainless steel.

8. Rubber seat washer, coupling washer confirming to IS: 937 should be used in landing valve.

9. It should be supplied with stud bolts (ASTM A193 GR B7 GALV, nut (ASTM A194 GR 2H GALV) & suitable asbestos free gasket (ASTM F 104).

10. Each valve body shall be hydro-tested to 21 Kgf/cm², & that of valve seat shall be hydro-tested to 14 kgf/cm² for 150 seconds without any leakage. Copy of test certificate shall be submitted along with supply.

11. Material test certificate shall be submitted along with bulk supply.

12. Painting: Landing valve top (except face of flange), and Instantaneous coupling should be painted fire red and hand wheel should be painted black.

13. Marking: Each assembled valve shall be clearly and permanently marked on the valve body: 1) Manufacturer’s name or Trademark, 2) Type of valve & Year of manufacturing in addition to BIS Certification Stamp & License Number (CM/L number).

14. Certificate, Literature, documents: Bidder should submit copy of BIS approval / certificate; catalogue/literature of offer equipment along with the offer.
# Specification of Portable Pump

<table>
<thead>
<tr>
<th>Sr. no.</th>
<th>Specifications</th>
</tr>
</thead>
</table>
| 1       | Rate Performance:  
           | Pump should be rated for:  
               | (i) Not less than 1800 LPM at 7 Kg/cm² at 3.0 M suction lift.  
               | (ii) 1600 LPM at 9 Kg/cm² at 3.0 M suction lift.  |
| 2       | Pump:  
           | (i) The water pump shall be single stage centrifugal high pressure turbine type directly coupled to the engine.  
           | (ii) The pump body shall be made of non-corrosive Aluminium alloy and impeller shall be gun metal. The pump shaft made of stainless steel.  
           | (iii) An easily accessible drain plug fitted in the pump volute to facilitate complete drainage of the pump casing.  
           | (iv) The unit shall have the following connections:  
               | Round threaded single suction inlet (MOC: SS) of 100 mm dia with blank cap.  
               | At least Two delivery outlets of 63 mm dia with instantaneous couplings and screw down flat valves. MOC of delivery outlets shall be SS.  |
| 3       | Priming System:  
           | (i) High efficiency large size vacuum pump shall be provided, assuring shorter suction time.  
           | (ii) The pump shall be capable to prime from a depth of 5-7 metre within 30 second at NTP.  |
| 4       | Engine:  
           | General:  
               | (i) Petrol engine water cooled.  
               | (ii) The pump should be operational at an angle of 30 degree to the horizontal.  
               | (iii) The pump should be equipped with an over heat sensor which automatically stops the pump in case of failure of cooling system.  
           | Cooling:  
               | (i) Open circuit cooling system shall be provided which has sufficient capacity to maintain correct engine operating temperature even when operating in high ambient temperatures.  
               | (ii) The engine cooling system shall be direct type where the water from pump circulates in the cooling jackets around the engine.  
           | Fuel:  
               | (i) Stainless steel fuel tank capacity should be adequate to allow pumping at the rated output for at least one hour without refilling it.  
               | (ii) Lubrication in pump shall be auto mixing with fuel on based of the engine speed.  
               | (iii) Pump shall be equipped with auto choking system which enables the pump to start even in cold climate.  |
|         | Electrical System:  
               | (i) The electrical system shall be of Magneto type.  
               | (ii) An ignition switch plus electrical starting by spring loaded twisted type switch shall be fitted and there shall be other methods also provided for emergency starting i.e. (Recoil starting / manual rope starting system).  
               | (iii) A maintenance free type battery shall be fitted. The battery shall be automatically charged during operation. And when the pump is not being operated battery could be charged by connecting search light adaptor with battery charger. Pump can be started by compensative charging.  
               | (iv) Battery shall not be more than 2 months old.  
               | (v) The pump unit shall be fitted with a adopter plug which be used to power auxiliary.  
               | (vi) The pump shall have an inbuilt flood light connection.  
               | (vii) Pump shall have External battery charger facility.  |
(viii) The engine throttle shall be of dial type throttle which ensures that the throttle stays in position not affected by vibrations of the engine if any.

<table>
<thead>
<tr>
<th>5</th>
<th>Control &amp; Instruments:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The pump shall be fitted with the following items which should be conveniently grouped on the control panel.</td>
</tr>
<tr>
<td>(i)</td>
<td>Engine start/stop Switch.</td>
</tr>
<tr>
<td>(ii)</td>
<td>Ignition indicating lamp.</td>
</tr>
<tr>
<td>(iii)</td>
<td>Cold start choke control</td>
</tr>
<tr>
<td>(iv)</td>
<td>Vacuum priming pump lever.</td>
</tr>
<tr>
<td>(v)</td>
<td>Throttle lever with low speed position, run speed for suction and high speed for discharge.</td>
</tr>
<tr>
<td>(vi)</td>
<td>Pump compound suction pressure gauge.</td>
</tr>
<tr>
<td>(vii)</td>
<td>Pump discharge pressure gauge.</td>
</tr>
<tr>
<td>(viii)</td>
<td>Engine temp indicating lamp/gauge.</td>
</tr>
<tr>
<td>(ix)</td>
<td>Battery charging lamp, low battery indicator.</td>
</tr>
<tr>
<td>(x)</td>
<td>Fuel level gauge/indicator.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6</th>
<th>Carrying Frame:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The unit is to be mounted on a strong tabular stainless steel carrying frame with folding type, lifting handles. The handleless should be lockable in various positions and should be fitted with rubber grips. The complete weight of the unit (engine + pump) should be such that it can be easily lifted &amp; carried by 2 persons.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>7</th>
<th>Testing &amp; Inspection:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vendor shall carry out 100% testing of the product (as per rated performance) for a period of 2 hours continuously in presence of GAIL’s representative.</td>
</tr>
<tr>
<td></td>
<td>Testing &amp; Inspection of the unit by the GAIL engineer will be done at vendor’s site.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>8</th>
<th>Paint Finish:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The unit is to be painted in red colour.</td>
</tr>
</tbody>
</table>

| 9  | Guarantee: At least one year guarantee for any defect                                 |

<table>
<thead>
<tr>
<th>10</th>
<th>Accessories:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PVC Suction hose - 2 nos. of 2.5 mtrs. Length.</td>
</tr>
<tr>
<td></td>
<td>Suction wrench – 2 nos.</td>
</tr>
<tr>
<td></td>
<td>First Fill of lube oil.</td>
</tr>
<tr>
<td></td>
<td>External battery charger unit.</td>
</tr>
<tr>
<td></td>
<td>All required spanners, tools and tackles for the maintenance purpose.</td>
</tr>
</tbody>
</table>

| 11 | Marking: Pump shall be clearly and permanently marked on the body: 1) Manufacturer’s name or Trademark, 2) Type. |

<table>
<thead>
<tr>
<th>12</th>
<th>Commissioning &amp; after sales services.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Supplier should be experienced in field of supply of portable pump and should provide free commissioning at site and training of the operators on use &amp; operation of the pump, trouble shooting and normal maintenance of the pump (tentative period 2-3 days).</td>
</tr>
<tr>
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<td>• The supplier will be responsible for free check-ups (at least three: first after one month, second after 6 months &amp; third before end of warranty period) of the machine during warranty period. Post warranty period, the supplier will have to provide after sales service of all types.</td>
</tr>
<tr>
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<td>• List of two years operation and maintenance spares along with price. This price will not be considered for evaluation, but GAIL at its sole discretion may place order for part of the list of complete list.</td>
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</table>

| 13 | Literature, documents: Bidder should submit catalogue/literature of offer equipment along with the offer. An operating manual is to be supplied with the unit, which should give details of both operating and normal maintenance procedures. |
Ejector Pump

1. The body of the water ejector/pump should be made of aluminium alloy.
2. The water ejector/pump should be suitable for use with the water pressure of hydrant system.
3. The water ejector/pump should have 100 mm male round threaded inlet and outlet at right angle to each other.
4. The water ejector/pump should be fitted with 63 mm SS/GM male type instantaneous connection.
5. The water ejector/pump should comply with the technical specification mentioned below.
   i. Maximum working pressure : 10 Kg (f) / cm² (Approximately)
   ii. Minimum working pressure : 5 Kg (f) / cm² (Approximately)
   iii. Test Pressure : 21 Kg (f) / cm²,
   iv. Inlet diameter : 100 mm, threaded
   v. Outlet diameter : 100 mm, threaded
   vi. Discharge : 1800 Litre / minute at : 7 Kg (f) / Cm 2 (Approximately)
   vii. Suction depth : 10 meters
6. The operating pressure should be 3 Kg (f) / cm² to 7 Kg (f) / cm².
7. Each water ejector/pump should be supplied with four suitable lightweight heavy duty polyethylene / polypropylene / PVC or suitable plastic material suction hoses of 100 mm diameter conforming to relevant Indian Standard of a minimum length of 2.5 meters each.
8. Each hose should be fitted with 100 mm diameter SS/GM (gun metal) make pair of male and female couplings conforming to relevant Indian Standard for suction hoses binded / winded at it’s either ends.
9. Each water ejector/pump should be provided with four numbers of washer conforming to the relevant Indian Standard for 100 mm diameter suction hose coupling.
10. The vendor should submit performance test report at the time of offer.
11. Material test certificate shall be submitted along with bulk supply.
12. Painting: Water ejector/pump should be painted fire red (except coupling).
13. Marking: Water ejector/pump should be clearly and permanently marked on the body: 1) Manufacturer’s name or Trademark, 2) Type.
14. Literature, documents: Bidder should submit catalogue/literature of offer equipment along with the offer.

Water Curtain

1. The body of the water curtain and coupling should be made of stainless steel 304/316.
2. The water curtain patterns should be uniform over curtain.
3. The curtain range angle should be 160-180 degree.
4. The water curtain should be fitted with 63 mm SS male type instantaneous connection.
5. The operating pressure should be 1.5 Kg (f) / cm² to 10 Kg (f) / cm².
6. Painting: Water Curtain (deflector plate) should be painted fire red/PO red (except coupling).
7. Marking: Water curtain shall be clearly and permanently marked on the body: 1) Manufacturer’s name or Trademark, 2) Type.
8. Literature, documents: Bidder should submit catalogue/literature of offer equipment along with the offer.

Breathing Air Apparatus Cabinet
(Wall Mounted or Free Standing Type)

1. A good quality FRP cabinet of wall mounted or free standing type suitable for storing breathing air set comprising of one BA cylinder and back plate assembly along with secondary face mask should be supplied. It should be suitable for both indoor and outdoor application.
2. The dimension of cabinet should be: H x W x D: 885 X 415X 280 mm (approximately)
3. Cabinet material, door, hinges, locks:
   a. The cabinet should be made up of good quality, well finished surface FRP material.
   b. The nominal thickness of the cabinet material should be 2.0-3.5 mm.
   c. The door should be front open type and adequately hinged to main body (03-04 hinges).
   d. One/two good quality locks should be provided.
   e. 04 numbers hanging hook recess should also be provided at back side with adequate reinforcement.
4. It should be capable to withstand a load of 30 Kg. (approximately)
5. It should be provided with one number cylinder rest at bottom and raised suitably (25 mm approximately)
   Adequate strength cylinder holder bracket and flexible webbing velcro (supported suitably at the back of cabinet) should be provided to place BA set securely in the cabinet.
   A compartment should be provided at the top to keep the face mask.
6. MATERIAL:
   a. Body: FRP (blue paint matt finish)
   b. Handles, hinges, chain,: SS 304 (powder coated)
   c. Lock: SS 304 clamp type powder coated.
   d. Screws & nuts: SS 304.
   e. Gaskets / grommets: EPDM Rubber
7. Marking: Each cabinet should be clearly marked (permanent/screen painted stickers etc.) on the body: Manufacturer’s name or Trademark, Compressed Air Breathing Apparatus / Suitable marking indicating content in the cabinet.
8. Literature/documents: Bidder should submit copy of catalogue/literature of offer equipment along with the offer.

Breathing Air Apparatus Cabinet (Hand Carrying Case Type)

1. A good quality FRP cabinet of hand carrying case suitable for storing breathing air set comprising of one BA cylinder and back plate assembly along with secondary face mask should be supplied. It should be suitable for both indoor and outdoor application.
2. The dimension of cabinet should be: L x W x H: 720 x 415 x 255 mm (approximately).
3. Cabinet material, door, hinges, locks:
   a. The cabinet should be made up of good quality, well finished surface FRP material.
   b. The nominal thickness of the cabinet material should be 2.0-3.5 mm.
   c. The door should be top open type and adequately hinged to main body (03-04 hinges).
   d. One/two good quality locks should be provided.
4. It should be capable to withstand a load of 30 Kg. (approximately). At least 04 nos. suitable PVC/Rubber etc. material rest to be provided at bottom.
5. It should be provided with cylinder rest at bottom part and raised suitably.
   Adequate strength cylinder holder bracket and flexible webbing velcro (supported suitably) should be provided to place BA set securely in the cabinet. It should also accommodate face mask.
6. MATERIAL:
   a. Body: FRP (blue paint matt finish)
   b. Handles, hinges, chain: SS 304 (powder coated)
   c. Lock: SS 304 clamp type powder coated.
   d. Screws & nuts: SS 304.
   e. Gaskets / grommets: EPDM Rubber
7. Marking: Each cabinet should be clearly marked (permanent/screen painted stickers etc.) on the body:
Manufacturer’s name or Trademark, Compressed Air Breathing Apparatus / Suitable marking indicating content in the cabinet.

8. Literature/documents: Bidder should submit copy of catalogue/literature of offer equipment along with the offer.

**Fire Fighting Delivery Hose:**

1. The hose must be conforming to IS : 636, type "B" and marked with IS : 636. Copy of BIS approval to be sent along with the offer & supply.
2. It shall be long lasting, fungus resistant & shall have unified lining and cover.
3. It must be designed for resistance from
   I. Impact and abrasion damage,
   II. Heat
   III. Weathering by ozone, oils and chemicals.
4. Size
   I. Diameter :- 63 mm
   II. Length :- 15 meters.
5. The hose shall have UL approval, copy of approval to be sent along with the supply.
6. The hoses must be provided with instantaneous type SS couplings of 63 mm size, pair of male and female parts, heavy quality and bearing IS 903 mark with copper wire (about 16 gauge) double binded / winded to above hose.
7. All the hoses shall be hydrotested. Certificate shall be provided along with the supply.
8. The Fire Water Delivery Hoses shall have guarantee / warrantee for any manufacturing defects for minimum 18 months from the date of supply.
9. Sample small length (about 10 centimetre without coupling) of hose shall be sent along with the offer.

**Multi Purpose / Triple Purpose (TP) Branch**

1. Hand controlled triple purpose branch with quick shut-off, spray, fog& jet pattern. Body of branch should be made of SS304/316.
2. The flow rate should be minimum 400 LPM at 7 kg/cm2 & be capable of holding 14 kg/cm2.
3. Throw 25-30 meter water jet at 7 kg/cm2 pressure.
4. The branch should be fitted with SS instantaneous male coupling, size 63 mm conforming to IS: 903.
5. Nozzle shall be light in weight than the conventional spray nozzle.
6. Catalogue, literature should be provided at the time of offer.
7. The nozzle shall have guarantee / warrantee for any manufacturing defects for minimum 12 months from the date of supply.
8. Supplier shall provide performance test certificate along with offer.

**Multi-Gallonage, Multipurpose Nozzle**

1. Multi-gallonage, multipurpose nozzle shall be made of strong lightweight Aluminum alloy /Pyro light material and hand controlled type.
2. Flow: Variable, multi-pattern (jet-wide angle fog/spray) and shutoff facility. Variable flow rates of 360- 750 lpm approximately.
3. Nozzle shall be capable of holding 14 kg/cm2 pressure in shut off condition. Jet range: 35-40 m at 7 bar.
4. It shall be of such design so as not to cause water hammer/back-pressure in operation during flow change and shutoff.
5. Inlet: 63 mm male instantaneous coupling.
6. Nozzle shall have provision of change of flow without changing pattern.
7. The spinning teeth of nozzles shall be made of SS 316 to ensure corrosion resistance and durability.
8. The inlet shall be provided with SS mesh/net to avoid entry of foreign material.
9. Nozzle shall have heavy duty shutoff ball valve and ensure a smooth action and long service life.
10. Ergonomic shaped pistol grip hand shall be designed for greater comfort and control to fire fighters.
12. It should be hydraulically tested to 21 kg/cm².
13. Performance and hydro test certificates shall be submitted along with supply.
14. Catalogue, literature should be submitted along with offer.

**Dividing Breeching**

1. Dividing breeching with control shall be as per BIS: 5131. Breeching shall be marked with ISI certification mark.
2. It shall be made either of leaded tin bronze conforming to Grade LTB 2 of IS 318 or stainless steel conforming to Grade I or IV of IS 3444.
3. It shall have one number 63mm (2.1/2") Gun Metal Male instantaneous inlet and two 63mm (2.1/2") Gun Metal Female instantaneous outlet connections, fitted with a control valve to shut off at a time any one of the two deliveries.

**Collecting Breeching:**

1. Collecting breeching having two numbers of 63mm (2.1/2") Gun Metal Male instantaneous inlet and one number 63mm (2.1/2") Gun Metal Female instantaneous outlet.
2. Connections as per BIS: 905. Aluminum alloy used for casting shall conform to IS designation 4450 or 4225 of IS: 617.
3. Breeching should be marked with ISI certification mark.

**Foam Making Branch FB-10X (450 LPM)**

1. Lightweight medium expansion Foam Making Branch as per IS: 2097.
2. Fitted with a selector valve having foam water solution discharge capacity of 450 LPM.
3. Foam Making Branch shall be fitted with a 63 mm GM inst. male inlet.
5. Having 450 LPM foam-water solution capacity at 7 kg/cm².
6. Catalogue, literature should be provided at the time of offer.
7. Supplier shall provide performance test certificate along with the offer.

**Foam Making Branch FB-5X (225 LPM)**

1. Lightweight low expansion Foam Making Branch as per IS: 2097.
2. Fitted with a selector valve and foam induction pipe having foam water solution discharge capacity of 225 LPM.
3. Foam Making Branch shall be fitted with a 63 mm GM inst. male inlet.
5. Having 225 LPM foam-water solution capacity at 7 kg/cm², complete with foam concentrate regulating valve and pick-up tube.
6. Catalogue, literature should be provided at the time of offer.
7. Supplier shall provide performance test certificate along with the offer.

**Hi Expansion Foam Generator**

1. Light weight high expansion Foam Generator fitted with 63 mm Gun Metal Male instantaneous coupling and a suitable handle.
2. It shall be powered by water turbine system.
4. Inlet foam water solution pressure: Min. 3.5 kg/cm²
5. Foam–water solution flow at 5-6 kg/cm² : 225 LPM.
6. Foam expansion ratio shall be not less than 1:200 @ 3.5 kg/cm².
7. Catalogue, literature should be supplied along with offer.
8. Supplier shall provide performance test certificate along with offer.

**Foam Inductor**

1. Light Weight Portable Foam Inline Inductor fitted with 63 mm Gun Metal Male instantaneous inlet & 63 mm Gun Metal Female instantaneous outlet coupling and a suitable carrying handle & support for positioning on ground.
3. Operating pressure range : 5 - 10 kg/cm²
5. Foam Induction: 3% to 6%
6. PVC braided transparent pickup tube connected with SS tube for induction.
7. Catalogue, literature should be supplied along with the offer.
8. Supplier shall provide performance test certificate along with the offer.

**Hose Reel**

1. Complete hose reel unit shall be supplied:
   a. It shall have 19-20 mm bore 30 Meter long, high pressure braided rubber hose having IS: 444 type II marking,
   b. It shall be swinging wall mounting drum type,
   c. It shall have 5-6 mm bore SS/brass shut off valve nozzle, &
   d. It shall be provided with inlet flow control ball valve.
2. Hose reel shall be IS: 884 marked
3. Hose pipe shall be hydro tested at 22.5 Kg/cm² pressure as per relevant IS and test certificate to be submitted with supply.
4. The drum shall be painted with two coats of zinc chromate primer and then two coats of enamel corrosion resistance 'fire red' paint as per shade 536 of IS: 5.
5. Catalogue/literature should be supplied along with the offer.
6. Supplier shall provide performance test certificate along with the offer
Aluminum Extension Ladder

1. 10.5 mtr. Aluminum Extension Ladder as per IS: 4571 – 1977 and ISI marked.
2. Width of the extending section shall be 30 cm.
3. The rounds shall be with non-slip serrations running in full length. The space between two rounds shall be 25 cm.
4. The heel of the Main part shall be provided with rubber shoes.
5. The extended Ladder shall be 10.5 meter.
6. Locking arrangement for extension of ladder.
7. Testing of the Ladder: the ladder should pass the tests as specified in IS 4571 – 1977
8. Capable of being extended by one man by means of manila rope.
9. Ladder clearly and permanently marked:
   i) Manufacturer’s Name or Trade name
   ii) The size of the Ladder
   iii) Year of manufacture
   iv) BIS Mark
10. Supplier should provide BIS certification copy, along with offer.
11. Catalogue/literature should be supplied along with the offer.

Spark Arrest or (Big):

1. Spark arrester shall be suitably fit to the Heavy commercial vehicles like truck, cranes, bus etc. Fitting ID approx. 86 mm or as per site requirement.
2. It is made of MS sheet of 18 gauge (approx.) thickness.
3. Adjustable tightening screw/nuts should be provided for the proper fixing of spark arrester on vehicle exhaust pipe.
4. It shall be approved by Chief Controller of Explosive (CCEO).
5. It should be suitably marked with CCEO approval, manufacturer name, and year of manufacture.
6. CCEO certificate shall be submitted by the bidder with offer and supply.
7. A drawing/literature of spark arrester should be sent to with offer.

Spark Arrest or (Small):

1. Spark arrester shall be suitably fit to the Light Motor vehicles. The fitting sizes shall be as per site requirement.
2. It is made of MS sheet of 18 gauge (approx.) thickness.
3. Adjustable tightening screw/nuts should be provided for the proper fixing of spark arrester on vehicle exhaust pipe.
4. It shall be approved by Chief Controller of Explosive (CCEO).
5. It should be suitably marked with CCEO approval, manufacturer name, and year of manufacture.
6. CCEO certificate shall be submitted by the bidder with offer and supply.
7. A drawing/literature of spark arrester should be sent to with offer.

Wind Sock with Stand

1. The wind sock shall be made of heavy duty pipe as per IS 1239 of 40mm ID. The length of wind sock stand shall be 10 feet (Approx).
2. The ring holding arm shall be welded on wind sock rotating system. Ring size: 2 feet diameter, 1 inch width, 2-3 mm thick (approximately).
3. The wind sock rotating system shall be of threaded type for easy fittings and removal from wind-sock stand pipe.
4. Wind sock rotating system shall have heavy duty ball bearing, double 'Z' water proof type.
5. Wind socks cloth made up of PP/PU coated cloth, having alternate red and white strip. Each strip shall be of 10-12 inch.
6. Length of socks shall be 6 feet with one end having diameter slightly more than 2 feet and other end narrow down to 1 feet (Approx).
7. The wind sock hood shall also have sufficient numbers (at least two) and suitable size (1-2 inch) fluorescent strip around or along the length of sock foe easy identification on illumination.
8. A good quality nylon cord should also be provided along with wind socks for tying.

### Safety Shower

1. The safety shower shall be push lever operated eye/face wash fountain and pull rod operated drench shower type. It shall be painted in green.
2. It shall have twin cushion flow atomizer with dust covered and automatic flow compensators.
3. It shall have impact/corrosion resistant shower head with perforated spreader and receptors in luminous yellow colour.
4. It shall have 1” ball valve for drench shower head and ½” ball valve for eye/face wash unit operation. The valve shall be of brass &/or SS.
5. The pipes used shall be heavy duty GI pipes, ISI:1239 marked and fitting to IS:1879 with pedestal. It shall be supplied with required foundation bolts.
6. It shall have 1½” female thread for supply line and 1¼” drain at bottom for eye/face wash unit drain line.
7. Both eye/face wash shall operates independently or simultaneously. Eye wash shall operate by push plate and drench shower shall operate by pull rod.
8. The safety shower shall be IS:10592-1982 (its latest revision) marked. Certificate shall be submitted with offer.
9. Catalogue/literature shall be supplied along with the offer.

### Fire Bucket

1. Fire bucket shall be IS 2546 marked.
2. It shall be made of galvanized mild steel with 10 litres nominal capacity.
3. It shall be painted as per IS 2546.

### Potassium BI-Carbonate Base Dry Chemical Powder for Fighting

1. **General:** The Powder shall be Potassium bi carbonate based dry chemical powder suitable for combustible liquids, burning gases, organic solid materials, mixed fires etc.
2. **Physical & Chemical Parameters:** To be tested as per latest IS:4308
   a. Potassium bi-carbonate content: 90% minimum by weight
   b. Appearance: White, free flowing powder
   c. Apparent density: 1 ± 0.15 gm/cm3
   d. Water Repellency: 1.5% Max
   e. Moisture content: less than 0.25%(m/m)
   f. Temperature stability: ± 60°C
   g. Corrosion & abrasion effect: Non corrosive / abrasive.
3. **Performance Test:** Should pass the Fire Test as per clause 4.12 of IS: 4308.

4. **Physiological Effect:**
   a. The DCP shall not have harmful ingredients.
   b. It should be environmental friendly & nontoxic to humans and animals

5. **Compatibility:** The DCP shall be compatible with all type of firefighting foam.

6. **Approvals:** The Dry Chemical Powder (DCP) shall be BIS: 4308 approved & marked on container/ bags.

7. **Packing:** The DCP shall be packed in 10kg/25kg good quality HDPE drums with hermetically sealed packs.

8. **Self-Life:** DCP shall have minimum shelf life of 05 years without any degrading of chemical & physical properties.

9. **Documents:** Must submit valid BIS: 4308 Certificate along with offer and supply

10. **Vendor shall refer Special Conditions of Contract (SCC) for required documents, inspection and marking and agree to supply as per terms & conditions of SCC.**

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**Mono Ammonium Phosphate Base A B C Type Dry Chemical Powder for Fire Fighting**

1. The Powder shall be Mono-Ammonium Phosphate based ABC dry chemical powder suitable for combustible liquids, burning gases, organic solid materials, mixed fires etc. It is to be used in hand portable & wheeled extinguishers, vehicles and fixed system.

2. **Physical & Chemical Parameters:** To be tested as per latest IS: 14609
   a. Mono-Ammonium Phosphate content: 90% minimum by weight
   b. Appearance: Light / Pale Yellow free flowing powder
   c. Apparent density: 0.75-1.1gm/cm3
   d. Water Repellency: 1.5% Max
   e. Moisture content: less than 0.25%(m/m)
   f. Temperature stability: ± 60°C
   g. Corrosion & abrasion effect: Non corrosive / abrasive.

3. **Performance Test:** Should pass the Fire Test as per clause 4.12 of IS: 14609.
   a. Physiological Effect:
   b. The DCP shall not have harmful ingredients.
   c. It should be environmental friendly & nontoxic to humans and animals.
   d. Compatibility: The DCP shall be compatible with all type of firefighting foam
   e. Approvals: The Dry Chemical Powder (DCP) shall be BIS: 14609 approved & marked on the container/bags.
   f. Packing: The DCP shall be packed in 20/25/40/45kg good quality HDPE drums with hermetically sealed packs.
   g. Self-Life: DCP shall have minimum shelf life of 05 years without any degrading of chemical & physical properties.
   h. Documents: Must submit valid BIS: 14609 Certificate along with offer and supply.
   i. Vendor shall refer Special Conditions of Contract (SCC) for required documents, inspection and marking and agree to supply as per terms & conditions of SCC.

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**Urea Complex Potassium Bi-Carbonate Dry Chemical Powder for Fire Fighting**

1. The Powder shall be Potassium Allophonate / Carbamate based dry chemical powder, a reaction product of Potassium Bicarbonate— Urea suitable for large scale high intensity flammable & oil gas fire.
2. **Physical & Chemical Parameters:** To be tested as per latest UL: 299C
   a. Appearance: Off- White free flowing powder
   b. Particle Size: 0.35 mm Maximum
   c. Apparent density: 0.6-0.9 gm/ml
   d. Water Repellency: 1.5% Max
   e. Moisture content: less than 0.25%(m/m)
   f. Temperature stability: - 60° to +50°
   g. Corrosion & abrasion effect: Non corrosive / abrasive.

3. **Performance Test:** Shall able to extinguish minimum a 144B Hydrocarbon tray fire by using 1.5 Kg Powder.
   a. **Physiological Effect:**
      i. The DCP shall not have harmful ingredients
      ii. It should be environmental friendly & nontoxic to humans and animals.
   b. **Compatibility:** The DCP shall be compatible with all type of firefighting foam.
   c. **Approvals:** The Dry Chemical Powder (DCP) shall be UL: 229C approved & marked on container/ Bags .
   d. **Packing:** The DCP shall be packed in 20/25/40/45Kg good quality HDPE drums with hermetically sealed packs.
   e. **Self-Life:** DCP shall have minimum shelf life of 05 years without any degrading of chemical & physical properties.
   f. **Documents:** Must submit valid UL: 229C Certificate along with offer and supply
   g. **Vendor** shall refer Special Conditions of Contract (SCC) for required documents, inspection and marking and agree to supply as per terms & conditions of SCC.

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**Aqueous Film Forming Foam for Fire Fighting**

1. **General:** The Aqueous Film forming Foam (AFF) shall be 3% concentrate, AFF shall be homogeneous i.e. no solidification or separations of crystals or stratification shall take place.

2. **Physical & Chemical Parameters:** to be tested as per latest IS:4989 Part-II
   a. PH Value for original conditioned sample : Between 6.5 to 8.0
   b. Specific Gravity for original conditioned sample: Between 1.0 to 1.15
   c. Viscosity at (27 ± 1)° C: 40 CST Maximum
   d. Miscibility with fresh/sea water: Miscible
   e. Sludge contents (% V by V): 0.25 Maximum.
   f. Freezing Point/ Pour point : Should flow at (-)5°C
   g. Spreading Coefficient : 3.0 (Minimum)
   h. Corrosion & abrasion effect: Non corrosive / abrasive.
   i. **Performance Test:** To be tested as per latest UL-162.
      a. Fire extinguishing time should be as per clause 10.
      b. Resistance to burn back: 8 minutes (minimum)
      c. 25% drainage time at (27 ± 1)°C: 90 Seconds (Minimum)
      d. Film Formation: Form aqua film
      e. Expansion Ratio : Between 8 to 12

3. **Physiological Effect:**
   a. The AFF shall not have harmful ingredients.
   b. It should be environmental friendly & non - toxic to humans and animals

4. **Compatibility:** The AFF shall be compatible with all type of firefighting DCP.

5. **Approvals:** The AFF shall be IS: 4989 & UL-162 approved & marked in the container.
6. **Packing:** The AFFF concentrate shall be packed in 20 ltrs / 30 ltrs / 200 ltrs superior quality HDPE drum. Packing of Foam should conform to BIS-7959-1987.

7. **Self-Life:** AFFF concentrate shall have minimum shelf life of 10 years without any degrading of chemical & physical properties.

8. **Documents:** Must submit valid BIS: 4989 & UL Certificate along with offer and supply.

9. Vendor shall refer Special Conditions of Contract (SCC) for required documents, inspection and making and agree to supply as per terms & conditions of SCC.