TECHNICAL SPECIFICATION

FOR

SUPPLY OF MULTIPURPOSE TYPE-B FIRE TENDER

2 X 363.3 MW

GAS BASED COMBINED CYCLE POWER PLANT,

PALATANA, UDAIPUR,
TRIPURA

TECHNICAL SPECIFICATIONS FOR SUPPLY OF MULTIPURPOSE TYPE-B FIRE TENDER AT 2 X 363.3 MW GAS BASED COMBINED CYCLE POWER PLANT AT PALATANA, TRIPURA

TABLE OF CONTENT

1. Work & Scope:

Multi-Purpose Water cum Foam cum DCP Tender having capacity to carry 6000 Ltrs. water with 1000 Ltrs. Foam and 500 Kg DCP for the use of fire brigade.

1.1 SCOPE OF SUPPLY

The Multi-Purpose Water cum Foam cum DCP Tender including all accessories will be designed & manufactured as per BIS / ISI and sound engineering practice. All the equipment & accessories will be fixed on the appliance in a compact & neat manner & will 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 cum Foam cum DCP Tender to be used for Fire Fighting. The scope of supply shall be inclusive of but not limited to the following:

- A suitable 19 Ton chassis preferably AL 1920 Cabin chassis BS-VI II, full forward control engine.
- Driver and crew cabin as per specification.
- A Multi pressure (normal & high) UL listed Centrifugal type pump Godiva/Firefly/Gaeta or reputed Commercial make capable of delivering 3000 LPM (03 Delivery).
- A Heavy-duty full torque Pneumatic Power Take Off Unit capable of transmitting power for driving the Pump with above features.
- A (SS 304) Water tank of 6000 liters Capacity.
- A stainless steel (SS 316) Foam Tank of 1000 liters capacity.
- DCP: 01 no. of 500 kg DCP (MAP 90) with 1 no. discharge hose of 15 Mts. shall be provided.
  - CO2: - 02 x 22.5 Kg. CO2 with discharge hose of 10 Mts. shall be provided.
- ISI marked Hose Reel 19mm x 60 Mtrs length.
- An Aquajet foam monitor of not less than 2000 LPM @7 Kg/CM2
- A battery-operated amplifier system of Sholphin/Grand or equivalent make.
- Trussed type Ladder 10.5 Mtrs Double Extension.
- Imported SCBA seats.
- Piping, necessary controls, hose lines and other accessories. Complete accessories as per Annexure – A.

1.2 USE

The multipurpose fire tender shall be used to carry the water, foam and DCP for firefighting purposes. The pump will be driven by P.T.O.

1.3 DETAILED SPECIFICATIONS

CHASSIS:

The Multipurpose Fire Tender (MFT) shall be fabricated on 19 ton chassis of Min GVW 18500 – BS-VI II or latest emission norms. Drag hook or eye of adequate strength and design shall be provided at the rear & front of chassis.

2. General Requirement:

2.1 DRIVER AND CREW CABIN:

Original cabin supplied by chassis OEM shall be retained to provide seating for Driver and Fire Officer.

- Additional Crew Cabin: Additional crew cabin for four (4) persons shall be built behind the Driver's cabin, with 2 doors and crew seat with Rexene seat & back. The Crew Cabin shall have steps for easy and quick boarding and un- boarding of firemen.

2.2 SCBA Seat:

The crew shall have individual seating, with each seat fitted with brackets for placement of Breathing Apparatus in an upright position. The seats shall be of the wear & walk away type so that when the crew disembarks from the vehicle the BA sets should easily come off the seats with them. The seat bottom will be theatre type, which will automatically flip up when the fireman gets up, thereby freeing up the space for easy embarking & disembarking. The seats shall have integrated seat springs to isolate shock while in motion. They shall have a fixed-type, seat-back recline, to improve rider comfort & an auto-pivot & return headrest for rapid seat egress. The side cushions shall be easily removable, to accommodate all types of SCBA. The seats shall have right shoulder seatbelt release & a chrome swivel bezel. Seats shall be certified by ARAI/ICAT/NFPA.

- The make of seats shall be Lighttec India / HO Bostrom.
- The Bidder must upload OEM Authority Letter should be provided confirming the specifications as mentioned above.
- The seat cushion for driver and fire officer shall be of latex foam rubber upholstered in good quality foam leather. The back rests shall be of latex foam upholstered in good quality foam leather.
- The cabin shall be provided and fixed with
    - Roof lamp of Lumax/Hale/Minda or equivalent make: 01 No.
    - Heavy duty wiper motor with arms and blade (if not provided with chassis): 01 No.
    - Heavy duty conquers double mirror: 02 Nos.
    - PA System of with Multi-Tone Hooter of 12/24Volts of Sholphin/Grand or Reputed Make: 01 No.
    - 12/24 volts DC one mile range electric siren of Ahuja/Kheraj or reputed make mounted on suitable place and heavy duty push button on driver and cleaner side : 1 No.
    - Suitable space for battery shall be provided.
    - All the controlling switches for lights, shall be of approved make and provided on dash board panel near main dash board.

3. Water Tank:

- A water tank of 6000 liters shall be fabricated from SS 304 material and mounted on the chassis. All the welding shall be by TIG/MIG welding. The welding of the tank shell shall be in such a manner that the first beading is from inside the shell and subsequent bead from outside the shell. The welded surface shall be cleaned of all slags, scale etc. There shall be minimum joints in the tank shell and hence plates used for fabrication of tank shall be of maximum size.
- The tank shall be mounted on the chassis onto a runner in such a manner that, the proper load distribution on each axle is achieved.
- The tank shall be provided with suitable baffle plates to prevent the surge of water while the vehicle is in motion, accelerating, braking in speed and cornering.
- The baffles shall be arranged in a manner to facilitate the movement of a person throughout the tank for welding, cleaning and general maintenance purpose.
- The tank shall be mounted on minimum three cross members to counteract the stresses caused by chassis flexing and shall be so secured that it can be removed easily for maintenance purpose. The tank shall be mounted on runner with the help of Nut Bolts with sufficient balata packing.
- The sidewalls and the baffle plates of the tank shall be fabricated from 5 mm and 4 mm thick respectively SS sheet, whereas bottom plates of the water tank shall be 5 mm thick SS 304 plate.
- The water tank shall be provided with 6 saddle supports, two on either side for mounting the tank on the runner.
- The water tank shall be fixed to the runner plate with 5/8" dia. bolt with nylock nut.
- Suitable lifting eyes shall be provided on the shell of water tank to enable it to be lifted from the vehicle for repairs / replacement as and then required.
- The tank shall be fitted with overflow pipe and it shall be taken down below the chassis but without reducing the ground clearance.

- The tank shall be fitted with one 63 mm instantaneous hydrant connection with ball valve and strainers, closed to the pump panel for filling the tank through 75 mm. bore pipe.
- A draw pipe of 100 mm. dia. pipe shall be taken from the tank to the pump suction inlet, incorporating a 100 mm butterfly valve of reputed make.
- The water tank with its piping and fitment shall withstand hydrostatic pressure of 0.3 bar.
- The water tank shall have one bolted manhole of 45 cm dia. made from 5 mm thick SS 304 plate. It shall have aluminum / gunmetal threaded cap with lugs of 30 cm. dia. for filling the water in the tank from outside.
- The locker of suitable size shall be provided with Aluminum Roll-Up Shutters (MCD / ARKA MAKE or reputed) with 40mm Shutter slate width and locking arrangement. The location and size shall be shown in the drawing. These lockers will be used for keeping delivery hoses accessories and high-pressure hose reel. The structure and locker shall be made from 40 x 40 x 4 mm thick Galvanize MS Angle with 16 SWG paneling from outside and 16 SWG aluminum chequered plate from inside. The floor paneling of locker shall be 14 SWG aluminum chequered plates.
- All lockers will be provided with internal automatic lighting arrangement with the master switch in the cab. The doors of the lockers will have efficient means for holding them closed by efficient flush fitting spring loaded locks. The doors of the side lockers with the exception low lockers will not be hinged at the bottom; doors of the low lockers hinged at bottom will have not less than 5cm ground clearance.
- Lockers Stowage compartments meant for tools, nozzles, couplings, branch pipes, adopters etc, shall be provided with suitable draw out racks made of light weight of aluminums sheets and heavy-duty self-fabricated rollers. The Stowage equipment are indicated in Annexure-A
- The tank shall be connected with the pump and hose reels and valves shall be provided in such a way that any of the following operations are possible.
    - Tank to pump
    - Pump to heat exchanger (cooling system)
    - Auxiliaries connections
    - Hydrant to hose reel
    - Pump to hose reel
    - Tank to water level indicator
    - Hydrant to tank via pump
    - Hydrant to tank direct
    - Tank to pump to monitor (Foam / Water).

4. FOAM TANK:

- A Foam Tank of 1000 Ltrs. capacity shall be provided. The Foam Tank shall be fabricated from 4 mm thick SS 316 sheets including sides, top & baffles.
- The tank shall have bolted manhole cover of 450 mm dia marked FOAM with filling orifice of 150 mm with blank cap. The strainer shall be of such material which shall not be affected by constant contact with foam compound & its total screening area will be adequate to permit quick filling of foam compound into the tank.
- The tank shall be suitably baffled to prevent surge while the vehicle is in motion or standing on uneven ground or brakes are applied to the moving appliance. The tank will have a dished top with funneling arrangement for easy filling of foam from drums. A suitable sharp edged tin opener shall also be incorporated in the tank top.
- The design of the tank shall incorporate a removable sump fitted with a drain valve. The foam compound draw off tube shall be positioned in the centre of the sump in such a manner that foreign matter or sludge will not pass into the compound line. The draw off tube shall be fitted with strainer of suitable material, mesh, size & adequate straining area.

- The draw-off tube shall be connected to the foam compound proportioner / Inductor & pump, as necessary & a flow control valve will be incorporated in it so as to maintain a constant induction rate of not more than 6 percent
- with varying foam output. The plumbing will have a clear and unobstructed passage of not less than 50 mm throughout.
- 1000 Ltrs AR-AFFF (KV FIRE) foam to be supplied along with Fire Tender.

5. DCP SYSTEM

- The DCP Tank shall be 500 kgs. capacity vessels. The DCP Vessels shall be mounted on the chassis in such a manner that the weight is evenly distributed on the chassis. The DCP pressure vessels shall be designed & fabricated as per relevant industry standard & suitable anticorrosion treatment shall be given to the internal surface of the vessels. The DCP vessels shall be equipped with filling aperture, pressure gauge, and pressure release safety valve. discharge plug, etc. at suitable locations. The vessel shall be designed for the use of Dry Chemical Powder.
- EXPELLENT: -
- N2 Gas shall be used as an expellant media. The DCP vessel shall have its own expellant gas cylinder assembly consisting of min, 02 Nos brand new N2 cylinders to discharge dry powder through a long-range monitor & hand line (hose reel). The total quantity of gas would be sufficient to discharge 500 Kgs. of DCP & for flushing the pipeline etc.
- The discharge valves of the Nitrogen cylinders shall be operated on the lever. The operating pressure of the dry 70% Air vessel shall not be more than 14 Kg/Cm2. The N2 cylinders will be positioned horizontally at suitable location with proper stand & support. The entire pipelines between the N2 cylinder & vessel shall be of rigid type with flexible rubber connections. Pressure regulators shall be provided between the N2 cylinders & the DCP vessel so as to regulate the flow of gas to the DCP vessel at not less than 14 Kg/Cm2 pressure. Arrangement shall be made to prevent back flow of the expellant gas. Each battery of N2 cylinders would be connected to a common manifold with necessary valve regulators etc.

6. PUMP (HIGH - LOW PRESSURE) :

- New pump shall be fitted. The centrifugal type, multi pressure, UL listed pump having output capacity of 3000 LPM at 7 kg/cm2 and 300 LPM at 40 kgs/cm2 at 3 Mtrs suction lift at NTP condition. The low-pressure side will be of single stage and the high-pressure side also with single stage having regenerative type impeller.
- The pump shall of Godiva/Firefly/Geeta Commercial make confirming to following specifications.
- The pump shall comply following performance parameters.
  - Normal Pressure output: 3000 LPM at 7 kgs/cm2
  - High pressure output: 300 LPM at 40 kgs/cm2
  - Deep lifting capacity of pump: 30 cm/sec. max. up to 7 Mtrs in 30 sec. at NTP condition.
- The overall pump shall be constructed from gunmetal. The normal (low) pressure impeller, volute, and impeller wearing shall be made from gunmetal confirming to Gr. II of IS 318/1981 and the regenerative type of high pressure impeller shall be of Aluminum, Bronze (AB-2). The pump shaft shall be made from stainless steel confirming to IS 6603/1972. The bearing housing will be made of C.I. and all the studs and bolts coming in contact with water shall be of stainless steel. The bearings used in the pump shall be of reputed make and preferably SKF.
- The normal and high-pressure impeller shall be mounted on a single shaft, and normal (low) pressure impeller shall be dynamically balanced.
- The pump shall be provided with self-adjusting mechanical carbon seal with marchrome interface. The mechanical seal assembly shall with stand dry running of pump for up to 2 minutes without any damage.
- The pump shall be provided with an inbuilt filter of easily removable type, which shall filter the water before entering into the high-pressure stage impeller.
- Operation of low pressure to high pressure or vice-a-versa shall be possible by actuation of single lever.
- The pump shall have facility to operate low pressure and high-pressure mode simultaneously or individually. While high pressure mode is in operation and delivering 300 LPM at 40 kg/cm2, the pressure in low pressure side shall not exceed 10 kg/cm2.

- The pump shall be provided in built (integrated in the pump outlet manifold) Pressure Relief Valve (PRV) which shall operate automatically and shall not allow the high pressure to increase beyond 45 kgs/cm2.
- The size of high-pressure outlet shall be of 25 mm connected to high-pressure hose reel
- The Thermal Relief Valve (TRV) shall be provided and fitted in the pump housing, which will open when both deliveries (HP and LP) are shut off for longtime to control the temperature of pump water. The Thermal Relief Valve (TRV) should open at 60 degree C and shall reset automatically when the temperature of water is within limit.
- The pump design shall be modular type and shall not have gaskets/packing. The arrangement shall be such that the carbon seal can be attended/removed without removing the pump body. The pump shall be provided deep groove heavy duty dual angular contact bearing immersed in oil bath.
- The pump shall be provided with one suction inlet of 100 mm dia. having round threads confirming to IS:902 of 1974 and two numbers of 63 mm delivery outlets having screw down type valves fitted with instantaneous couplings as per IS 903/1993. The delivery valve screw shall not be with gland. The high-pressure outlet shall not be less than 25 mm and shall either be flange on screw type.
- The pump housing shall have provision to connect to internal cooling system.
- The pump shall be mounted at the rear of the vehicle connected to P.T.O. by propeller shafts and universal and slip joints with sufficient number of bearing supports.
- All the valves used shall be of AUDCO/L&T/DRP or equivalent make with all the piping of required size of 'C' class Galvanized.

6.1 Pump primer

- The pump with its fitment shall be tested hydrostatically to 1.5 times the working pressure at the pump i.e. for low pressure side it shall be tested to 21 kg/cm2 and high-pressure side will be tested to 52 kgs/cm2. This testing shall be carried out in presence of the C.F.O or his authorized representative and certificate to them effect from pump manufacturer shall be submitted.

    - The priming system shall be horizontal Reciprocating type integrated in pump bearing housing. The priming shall be fully automatic in operation and shall not require any operation whatever from the pump operator other than throttling the engine to the required RPM. The primer shall get automatically disengaged once the pump is registered the pressure. The primer shall be capable of lifting the water in 30 seconds from the depth of 7 Mtrs. (up to pump inlet) at NTP condition. The pump shall attain a dry vacuum of 620 mm of Hg.
    - The reciprocating pistons shall be made up of stainless steel and reciprocate in self-lubricated linear bearings. The cylinder and priming valve housing shall be made from gunmetal. The eccentric cam shall be fitted on pump main shaft to operate the pistons with neoprene rubber inlet and outlet valves. The primer shall disengage automatically at a pump pressure of 1.5 to 2.0 kg/cm2.

7. PNEUMATICALLY OPERATED POWER TAKE OFF (P.T.O.) UNIT:

The power for driving the water pump shall be taken from the vehicle's (chassis) main Engine and not from any other auxiliary Engine placed on the deck or platform of the Fire Vehicle. This shall be achieved with the incorporation of a Pneumatic (PTO) Power Take Off Gearbox also known as SSU (Split Shaft Unit) that shall be placed between chassis' main gearbox and rear axle (differential) by splitting the propellor shaft in 2 parts. Both the engine and differential propellor shafts along with other Driveline Components (couplings, yokes, universal joints, slip joints) should be dynamically balanced for elimination of any circular (Radial) outness and ovality. minimum distance between the two bearings should be 35mm.

- The Step-Up PTO Gear Ratio should be selected in such a way that the engine run's on minimum RPMs YET delivering the required amount of Torque and RPMs to the fire pump, this shall reduce the overall consumption of fuel and increase the efficiency of the Fire Vehicle.
- The PTO gearbox should have a big and wide side cover for easy maintenance and inspection. The entire PTO operations should be observed (including shifting of transmission) with the side cover open. Also, transmission locking system (ball spring assembly) should be on the outer frame of the side cover for easy adjustment and replacement. All Driveline components should be able to dismantle and reassemble with the side cover open and without dismounting the PTO from chassis.
- Both input & output shafts of the PTO should have Double Bearing Housing Covers supporting 2 bearings each on the input and output shaft to absorb both radial and axial loads and vibrations of the propeller shafts. The

7.1 In Line Cooling Coil

Input of water for cooling the PTO is provided from the rear side of the PTO (through the tank) and output of cooling coil is delivered to the front of the chassis to the engine's radiator for max heat dissipation. This causes bending of cooling pipes as both the inlet and outlet are present on the rear side of the PTO. Hence, input water should be on the rear side and outlet should be on the front side to avoid bending of pipes.

- The Bidder must upload OEM Authority Letter confirming the above specifications with tender reference number.

8. CONTROL PANEL:

- An adequately illuminated control panel shall be provided near the pump and easily accessible to operator for operating different controls. The control panel of required size shall be made from 3.15 mm aluminum sheet.
- Pressure gauge : Low pressure :0 to 17 kg/cm2 (Glycerin filled) : High pressure: 0 to 50 kg/cm2
- Compound gauge : Vacuum: 0 to 680 mm of hg in Red. Pressure: 0 to 10 kgs/cm2 in Black.
- The pressure gauge and compound gauge shall be of Fiebig/H-Guru make Glycerin filled with min 3" dia. panel mounted.
- High pressure hose reel circuit control.
- Cooling water circuit controls.
- Change over lever from LP to HP mode located at convenient position.

9. AUTO REWINDING HIGH PRESSURE HOSE REEL WITH GUN

Two nos. of high-pressure hose reels of reputed make to be fitted. The 20 mm inner dia. approx. hose shall be of reputed make and having length of the hose shall be 60 m with manual operated mechanism to roll the hose shall be provided. The connection between the HP Fog/jet gun and the hose shall be using sure lock coupling. The couplings on either end of this reel shall be sure lock type. A guarantee of minimum two years should be provided for hose and hose reel. The hose reel should be mounted suitably such that the rolling mechanism to roll/unroll of the hose reel should be hassle free. Hose reels shall be covered to avoid weathering effects.

Mechanism of Hose reel: Out of two hose reel one should be High pressure electrically operated Auto Rewind hose reel shall be located at appropriate location of the fire appliance to facilitate operation of the high-pressure section of the Fire Pump. Auto rewind hose reel shall be equipped with a universal frame and 12/24 Volt motor to be mounted, additional Manual Rewinding mechanism shall be provided. The hub shall easily be removed for ease of installation by removing the chain guards and bolts that secure the hub to the frame. All motor parts except for the electric motor and sprocket teeth, shall be powder painted. All hardware shall be of Stainless Steel. Hose reel shall have die pressed disc with rolled edges to prevent sharp edges. Reels shall include a 1" leak proof swivel with female threads on the inlet and swivel with male threads on the outlet. Hose reel shall come with the solenoid switch to auto rewind the reels. The hose reel assembly (without hose) shall be tested at 1.5 times of the operating pressure. The hose reel shall be compact in size to accommodate in the lockers of the appliance.

10. AUXILLARY COOLING SYSTEM:

- The vehicle shall be provided with Auxiliary cooling system to maintain the temperature of engine within the manufacturer's recommended limit when engine is running continuously in stationery condition.
- The cooling system shall be an INDIRECT OPEN CIRCUIT type.
- The heat exchanger tank shall be made from 14 SWG Brass sheet with copper coil.
- The heat exchanger tank shall be mounted below the Radiator in the front.
- The design of auxiliary cooling system shall be such that it does not allow the cooling water to increase above 85 degree centigrade when the pump is running continuously for a period of minimum four hours delivering full rated output under ambient temp. Between 30 to 40 degree centigrade.

11. FOAM PROPORTIONING SYSTEM:

An around the pump proportioned shall be fitted between the suction and delivery of the pump which inducts air foam liquid into the water stream. It shall comprise of a collector valve and an inductor. The foam inductor shall have selection option of 3%, 6% and off. Off position isolates proportioned thus allowing the pump to operate in normal manner. Auxiliary foam pick up connection to take foam from Outside shall be provided.

11.1 WATER CUM FOAM MONITOR

Monitor should be made of Aluminum Alloy with flow not less than 2000 LPM and can rotate up to 360 degree in horizontal plane. Vertical Plane movement -70 below horizon to 85 Degree above horizon Vertical & horizontal movement should be with the handle. Made of primary aluminum, thermic treated, high strength protected against corrosion. Diffuser should have inlet of 3 inch with selectable flow settings of 500-1000-1500-2000 LPM and can be fitted on the outlet of monitor. Diffuser should have two lugs of stainless steel for flow settings, should able to give jet & Fog 120 degree. Monitor & Diffuser shall be of same make to achieve the performance. Length of the diffuser should not be more than 240 mm. Flow settings can be done while in working condition there is no need to close any valve to change the flow settings.

12. SEARCH LIGHT:

1 No. of Search Lights to be mounted on top of the vehicle. The search light shall be an improved and simplified version equipped with an infinite horizontal rotation function. It shall feature an LED light source with a high-concentration reflector to ensure strong and focused illumination. The unit shall incorporate a conducting ring enabling continuous 360° horizontal rotation and over 135° vertical rotation. A standard controller shall be provided, and the self-locking motor shall ensure secure positioning when folded. The equipment shall operate on DC 12V ±10% or DC 24V, with a power rating of 35W, and deliver a minimum luminous flux of 3240 lumens. The remote-control functionality shall allow operation at distances greater than 30 meters, and the system shall conform to a minimum protection level of IP65.

13. ELECTRICAL SYSTEM:

- All the important electric circuit shall have separate fuses, suitably indicated and shall be grouped into a common fuse box at an accessible position. The wiring shall be single pole with negative earth.
- Suitable sized wire shall be selected for different circuits considering the current consumption for that circuit.
- All other light, dashboard light, cabin light, lockers lights shall be of Lumax/Hale/Minda or equivalent make.
- All the controlling switches of lights fitted on dashboard shall be of approved make.
- Two new Fog Lamps of approved make shall be provided and fitted on front bumper with controlling switch on dashboard.

14. AREA LIGHT-MAST:

- **Type of Lamp:** LED 48 Nos
- **Rated Power:** 144W (2 Light Heads of 72W each)
- **Input Voltage:** 12V
- **Rated Luminous:** 3600 (Low) / 12000 (High) **Color Temperature (degree K):** 6000-7000K **Type Of Battery:** 12V24AH Lithium battery
- **Material**: Telescopic rod: aluminum alloy three-pole case: PP+20%GF
- **Dimensions:**
  - Case: 550X348X249 mm
  - Head: 178X137X92 mm
- **Color:** Greyish Black
- **Working Time:**
  - Strong: 4.5H
  - Middle: 9H
  - Low: 20H
- **Battery Charging Time:** 6 hours
- **Operation Modes:** 4 Modes (LOW-Medium-High-FLASH)
- **LED Bulb Life:** 1,00,000h
- **Telescopic Mast Height:** Extendable up to 2 meters
- **Waterproof:** IPX5
- **Weight:** 12.6 kg Approx (Including Battery)
- **Light Shape:** Spotlight and Floodlight (Flood into Spot in 1 second)
- **Low Battery Warning:** Intermittent Blinking
- Accessories: AC charger, DC charger, USB power adapter, Reflective strip Case, Allen Keys
- **Beam Spread:** 360 Degree
- **Head Rotation:** 90 Degree
- The Bidder must upload OEM Authority Letter confirming the above specifications with tender reference number.

15. CABLE WINCH:

- An electrically operated cable winch of not less than 6.8 tons pulling capacity (single line) would be provided. The winch unit should have min. 5.4 hp, 12v or 24v DC series wound electric reversible motor. The motor and solenoids shall be grounded to battery. It shall have an automatic load holding brake system. For free spooling the clutch design shall be with spring loaded pull and rotate system. The gear system should be 3 stage planetary type for faster line speed and gear reduction ratio shall not be more than 360:1. The rope drum shall not be more than 4 inches dia and shall be supplied with minimum 28 mtr heavy duty galvanized wire rope with replaceable self-locking hook. The winch shall be mounted on the front bumper of the vehicle with suitable strong supports and a 4 way roller fairlead. The weight of the winch shall not be more than 56 kgs.

- Make: Lighttec India, Warn, Ramsey.
- Note: The make and model of the Winch, with supporting catalogues/ brochures/ drawings etc. should be attached with the Technical- Bid/offer.
- The Bidder must upload OEM Authority Letter confirming the above specifications with tender reference number.

16. PAINTING

- The complete super structural members including cross members of Drivers cabin shall be painted with two coats of Red Oxide primer, and two coats of chassis Grey paint manufactured by Dulux/Berger/Du-pont or equivalent make.
- The complete external and internal aluminum paneling of driver's cabin, lockers etc. shall be painted with two coats of Zinc Chromate paint.
- The complete exterior of the vehicle shall be painted with two finish coats of "POST OFFICE RED".
- The complete internal surface of water tank shall be prepared by sand blasting and immediately applied two coats of Epoxy primer and two coats of Epoxy paint including baffle plates.
- The words in English shall be provided on both sides of vehicle on the water tank in a suitable size letters.
- The "EMBLEM" of the department shall be provided on both sides of vehicle.

17. LIST OF EQUIPMENT

Following Equipment's shall be supply along with each **Multipurpose Fire Tender**

Sr.	Item Description	Qty.
1	Non percolating flexible Fire Fighting Delivery Hose, IS: 636–1988 type B mark. Size: 63 mm x 15 Mtrs. Hose coupling, 63mm x 63mm size, S.S. inst. pattern, pair of male & female parts, duly copper wire bounded with above hose.	06 Nos.
2	PVC suction hose heavy duty GREY complete with copper alloy round threaded couplings to suit the pump inlet – 2.5m long.	3 Nos.
3	Suction Strainer	1 Nos.
4	Basket strainer	1 Nos.
5	Dividing breaching with control arrangement as per IS:5131	1 Nos.
6	Collecting breaching as IS:905	1 Nos.
7	Suction Wrench (IS:4643-1968)	2 Sets.
8	Manila Rope Short line, 50 mm circumference, 15 m long	2 Nos.
9	Hose Bandages Rubberized	6 Nos.
10	Hose Clamps	6 Nos.
11	Two Way collecting Head	1 Nos.
12	Branch pipe, universal (see IS:2871-1983**)	1 Nos.
13	Hand controlled branch for 63 mm size hose coupling	1 Nos.
14	Branch Pipe Short	2 Nos.
15	Extension ladder — 10.5 Mtr	1 Nos.
16	First aid box for 10 persons	1 Nos.
17	Rubber gloves 33 KV 1 pair	1 Nos.
18	Asbestos Gauntlets	2 Pair
19	Spade	1 Nos.
20	Crowbar	1 Nos.
21	Sledgehammer	1 Nos.
22	Carpenter's saw, 60 cm.	1 Nos.
23	Hydraulic jack-20 ton	1 Nos.
24	Fire hook	1 Nos.
25	Life Jacket	4 Nos.
26	Tool Kit – consist of Rig spanner set, Fixed spanner set, Pillar and Screwdriver one no. each	1 Set
27	Flame proof Torch	2 Nos.
28	Gum Boot	4 Pairs
29	Breathing Apparatus set – Self-contained compressed air breathing apparatus set with spare cylinder of at least 45 min working duration.	2 Nos.
30	Seven Layered Aluminized Fire Entry Suit (Specification as per Annexure 1)	2 Nos.
31	Foam making branch pipe – FB 5X with pick up tube	01 No.
32	Floating Strainer: One floating strainer should be provided along with the fire tender to protect transfer and pickup pumps from damage caused by entrapment of water contaminated by sludge, gravel or other potentially damaging material. It should have a rotating suction chamber which	1 No.

	compensates for the weight and drag of the suction hose, the it always remains upright and stable. Strainer should be constructed from impact resistant polyethylene. Rotating strainer remains upright when connected to pickup hose. It should have manually released clack valve to prevent back flow. Approx Dimensions 604 x 454 x 171 mm. It shall have minimum Flow rate 2000lpm and shall not be more than 8 kg weight. The Bidder must upload OEM/Authorised Dealer Authority Letter confirming the specifications as mentioned above along with the Technical- Bid/offer.	
33	Smoke Cutting Torch: Body shall be made of Polycarbonate which is resistant to flame, heat and shock. Shall have laser pointer. Min. power output 10W with 1300 lumens. 3 Modes light control high/middle/low having rechargeable battery pack with battery power remaining indicator. Beam distance shall be min 300m. The torch shall have a hard metal yellow protruding part to penetrating smoke and break the window for escaping. Torch shall have one self-defense alarm function & rescue alarm function, if the user does not move for 10-15 sec it shall send rescue signals with strong flashing lights and alarm sound of 90dB. Battery capacity shall be min. 2,600mah with using time 1.5hr to 8hrs. CE & IP67 approved. The Bidder must upload OEM/Authorised Dealer Authority Letter confirming the specifications as mentioned above along with the Technical- Bid/offer.	1 No.
34	Water Gel Blanket	2 Nos.
35	Bolt cutter	2 Nos.
36	Multi Class Fire Extinguisher - 6 Litres Capacity Fire Extinguisher 6 litres, Stored pressure type, extinguishing agent Fluorine free Synthetic foam, CE Marked, Gross weight-9.45Kg, Net Content- 6 litres, Height of the Can- 520 mm, Squeeze grip operation, Applicable on Class A, B, C, F, ESF, Li- Battery fires, Fire Ratings to IS:15683- 4A, 144B, 25F, Battery Rating to NTA 8133 600 Wh, Can Construction- Deep Drawn & MIG welded, Valve/Cap Construction-Forging & Machining, Internal Coating-Plastic Lining, External coating- Epoxy Polyester Powder coating, Warranty- total 6 years (3 years+3 years extendable), Min. Effective Discharge Time (MED) (as Per Is 15683)- 26-30 seconds, Min. Bulk Range of Discharge (as Per Is 15683)-4.6 meters, working pressure-15 bars, Dia of the shell- 160 mm, Operating tel11perature- +5Co to +60Co, Hydrostatic test pressure- 35 bars, Cylinder material of construction- Steel CR2(DC01), Body thickness-1.4 mm. The extinguisher should be tested & certified by a certified testing agency for 600Wh. The extinguisher should be tested for Class C fires as per global acceptable standards AS/NZS 1850:2009. The extinguisher should be tested & certified for electrical non-conductivity as per the Dielectric test of IS 15683:2018. The extinguisher should be PED certified to PED 2014/68/EU, ANNEXIII (MODULE H). The fire extinguishing agent should be Fluorine Free Synthetic Foam. The Bidder must upload OEM/Authorised Dealer Authority Letter confirming the specifications as mentioned above along with the Technical- Bid/offer.	1 No.

Annexure 1

Specification of Seven Layered Aluminized Fire Entry Suit: -

SUIT	▪ Aluminized seven layered Fire Entry Suit made from P-Aramide based aluminized material as light in weight as possible. ▪ The suit should consist of Coat, Pant, Hood, Gloves and Boots.
MATERIAL OF CONSTRUCTION:-	
OUTER LAYER:	▪ The outer layer should be made from 2 layered Para-Aramide based aluminized membrane material. ▪ The fabric should have a total weight of 480g/m^2 (+/-20g/m^2) ▪ The fabric should be tested and certified to EN 11612:2015 – A1, B1, C3. D3, E3, F2 minimum. ▪ The fabric should offer excellent thermal, radiant, and convective heat protection. ▪ The Fabric should be very flexible ▪ The Lamination of the Base Fabric should be very firm and should be able to reflect the Intense Fire during Fire Entry Application. ▪ The Membrane used to laminate the Base Fabric and Aluminum Shelf should be soft and flexible.
SECOND LAYER	▪ Thermal barrier. The second layer should be made from Neoprene / Silicon coated fiber glass material not weighing more than 450GSM.
THIRD LAYER	▪ Thermal barrier. The third layer should be made of three layers of Flame-Retardant thermal barrier felt material, not weighing more than 450GSM.
INNER MOST LAYER :	▪ The innermost layer should be made from Flame-Retardant fabric. ▪ The fabric should have a weight of 380 GSM – 400 GSM ▪ The fabric should be tested and certified to EN11612 – A1, A2, B1, C1, E3 & F1.
DESIGN OF THE SUIT: -	The suit should be designed in Coat and Pant pattern.
COAT	▪ The coat should be designed to offer maximum protection with limited discomfort to the user. ▪ The coat should be provided with front zip fastening arrangement with overlapping flap-with Velcro. ▪ The sleeves of the coat should be provided with elastic wrist and finger loops with added press buttoning tightening arrangements. ▪ The coat should be stitched with flame retardant and mechanically strong P-Aramide Thread. ▪ The coat should be provided with high protective collar with neck guard and Velcro tightening arrangements for better protection. ▪ The Coat should have an added breathing apparatus pouch to fit a complete Breathing Apparatus.

PANT	▪ The pant should be designed to offer maximum protection with limited ▪ discomfort to the user. ▪ The pant should be provided with zipper and Velcro overlapping at fork area. ▪ The pant should be provided with fastening arrangement at the bottom. ▪ The pant should be stitched with flame retarded and mechanically strong P-Aramide thread. ▪ The Pant should be provided with adjustable Suspenders upto the Shoulders and should be able to tighten and loosen the Fitting.
HOOD	▪ The hood should be designed to cover the full head area and overlapping the shoulder. ▪ The hood should be provided with two fastening arrangements to hold the hood firmly on the head. ▪ The hood should be provided with Polycarbonate silver / gold plated visor for better heat reflection and certified to EN 166. ▪ The inner of the hood should be provided with imported CE certificate Fire Man Helmet certified to EN 443 having Air Vents on top of the Helmet. The Helmets should be certified to EN 16473:2014, EN 16471:2014, EN 12492:2012, EN 14458 along with EN 443 Certification. ▪ The hood should be stitched with flame retardant and mechanically strong P-Aramide thread.
HAND GLOVE	▪ The hand gloves should be designed in four fingers and a thumb pattern. ▪ The hand gloves should be provided with added layer of P-Aramide on palm and fingers area for added heat and mechanical protection. ▪ The length of the gloves should be 14". ▪ The glove should be provided with fastening arrangement at the cuff area. ▪ The gloves should be stitched with flame retardant and mechanically strong P-Aramide thread.

BOOTS:- The boot should consist of two portions: inner safety shoes and upper cover made from aluminized materials.

INNER SAFETY SHOES	▪ The inner safety shoes should be manufactured from high quality Rubber with Rubber sole having heat resistance up to 300 Deg. with good grip and chemical resistance. ▪ The shoe should be provided with Composite Toe cap and Composite Mid-Sole for better heat and impact resistance. ▪ The Shoes should be Certified to EN 15090 – Level 3 – HI3, F3A, SRC. ▪ The Boots should be one Piece without ant stuck on glues being used.
UPPER COVER	▪ The upper cover of the shoe should be made from P-Aramide based aluminized material with press button arrangement at the ankle and bottom area.
DOCUMENTS & APPROVALS	▪ The aluminized outer fabric should be tested and certified to EN 11612. ▪ The Flame Retardant inner layer fabric should be tested and certified to EN 11612. ▪ The helmet should be certified to EN 443 and EN 16473:2014, EN 16471:2014, EN 12492:2012, ▪ The visor should be certified to EN 166 ▪ The Shoes should be Certified to EN 15090 – Level 3 – HI3, F3A, SRC ▪ Other Certifications as mentioned in the Specs. ▪ The Bidder must upload OEM/Authorized Dealer Authority Letter confirming the specifications as mentioned above along with the Technical- Bid/offer.
WARRANTY	▪ Warranty Period 1 (One) year from the date of supply. ▪ Product demonstration to be conducted during technical evaluation.