NTPC LTD

CPG-1/Raipur

VENDOR DEVELOPMENT CELL

Sub: Qualifying Requirement (QR) for Vendor Enlistment for Fire Tenders (CAT-1) - 68MEG-01

A)	MEG DETAILS		
	1.0	MEG NO.	**68MEG-01**
	2.0	MEG DESCRIPTION	**Fire Tenders (CAT-1)**
	3.0	RESPONSIBILITY CENTRE	CPG-1/VDC
B)	**Technical Criteria of QR:** 1. The applicant should be a manufacturer / fabricator of 'Water Tender(s), Foam Tender(s), DCP Fire tender(s) and Multipurpose fire tender(s)'.		
C)	**Documents to be submitted as proof of meeting the stipulated Qualifying Requirements:** 1. Latest annual report OR NSIC registration certificate / BIS license / ISO certificate / Certificate of registration from the concerned excise department / any other statutory document as a proof of being manufacturer of the required material. 2. Copy of Purchase Orders (POs) and inspection reports/MDCCs (Material Dispatch Clearance Certificate) for fire tenders to prove credentials as a manufacturer/ Fabricator of fire tenders, during previous five years from the date of application. NTPC can ask more documents if felt necessary.		
D)	**Other Documents to be uploaded: In addition to the documents required in support of Qualifying Requirements as stated at C) above, following documents are also required to be uploaded by the applicants applying for enlistment: -** 1. Three POs of the highest executed values of similar works during previous five years from the date of application. Copy of Invoice / Completion certificate from the concerned buyer/s in support of successful execution of supply against the POs to be submitted. 2. Audited balance sheet including Profit & Loss statement for the previous three completed financial years reckoned from the date of application. In case the audited result for the preceding financial year is not available, certification of financial statements from a practicing-chartered accountant is to be uploaded. In case, applicant is not able to submit the certificate from practicing chartered accountant certifying its financial parameters, the audited results of the three consecutive financial years preceding the last financial years shall be considered for evaluating the financial parameters. Further, a certificate would be required from the CEO/CFO stating that the financial results are under audit as on date of application and certificate from the practicing chartered certifying the financial parameters are not available 3. Any other documents in addition to the above which the applicant wants to submit. NTPC can ask more documents if felt necessary.		

E)	NOTE-1	**Similar works means:** Supply of fire tender(s) built on 16 Tonne Capacity Chassis or more.
	NOTE-2	The executed value means Basic value of quantity of similar works executed/supplied against the reference PO (also applicable to partly executed POs as on date of application). Where PO value is composite (i.e., including Taxes etc.), the applicant to give item-wise break-up of Composite PO value mentioning Basic Value, Taxes etc
	NOTE-3	Other income shall not be considered for computing annual turnover.
F)	QUALITY PLAN	**ATTACHED**
G)	Category of Enlistment	**CATEGORY-1**

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VENDOR DEVELOPMENT CELL

Sub: Technical Specifications for Vendor Enlistment for Fire Tenders (CAT-1) - 68MEG-01

A)	MEG DETAILS		
	1.0	MEG NO.	**68MEG-01**
	2.0	MEG DESCRIPTION	**Fire Tenders (CAT-1)**
	3.0	RESPONSIBILITY CENTRE	CPG-1/VDC
B)	**Technical Specifications** 1. Fire Tenders built on 16 tons to 25 tons (Gross Vehicle weight) Chassis Capacity. Other technical requirements shall be as per Indian Standards / CISF technical specifications.		

1. SCOPE

This standard lays down requirements regarding materials, design and construction, workmanship and finishing with accessories and equipment for DCP tender of 2000kg capacity.

2. GENERAL REQUIREMENTS

The DCP Tender would be fabricated generally conforming to IS - 10993 on TATA/LPT-1613 or equivalent capacity Chassis, BS-VI or latest. The GVW of appliance will not cross the GWV of chassis manufacturer's specifications with all equipment & Crew. The weight distribution diagram should be submitted for approval.

3. CAPACITY

The DCP Tender would be of 2000 kgs., i.e. 2 x 1000 kgs. capacity vessels will be provided. The DCP Vessels would be mounted on the chassis in such a manner that the weight is evenly distributed on the chassis.

ii) The DCP pressure vessels would be designed & fabricated as per ASME CODE VIII of unfired pressure vessels & suitable anticorrosion treatment would be given to the internal surface of the vessels.

iii) Each DCP vessels would be equipped with filling aperture, pressure gauge, pressure release safety valve, discharge plug, etc. suitable locations.

iv) Each vessel would be designed for the use of Dry Chemical Powder. The each vessel would be of adequate size to accommodate 1000 Kgs. of DCP & also have adequate empty area to facilitate easy movement of the N2 Gas & dry powder in the vessel to maintain fluidity.

Suitable device shall be provided or arrangement made to restore the fluidity of the powder to ensure its capability to flow through the fittings, valves and pipelines to the outlets.

4. EXPELLENT

The expellant gas system shall preferably have nitrogen gas in cylinders of capacity not less than 50 litres each, having filling pressure of not less than 200 kg/cm2. The gas shall be sufficient to discharge 2000 kg of dry Chemical powder through the long-range monitor and hose-reels. Each DCP vessel will have its own expellant gas cylinder assembly consisting of min. 04 Nos. brand new N2 cylinders these cylinders should be CCE approved & ISI marked (IS 7285) to discharge dry chemical powder through a long range monitor & two hand lines (hose reels) or both at one time. The total quantity of gas would be sufficient to discharge 2000 Kgs. of DCP & for flushing the pipeline etc.

i) The discharge valves of the Nitrogen cylinders would be lever operated. The operating pressure of the dry powder vessel will not be more than 14 Kg/cm2.

ii) The N2 cylinders will be positioned horizontally behind the driver's cabin with proper stand & supports. The entire pipelines between the N2 cylinder & vessel would be of rigid type with flexible rubber connections. Pressure regulator/s would 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 will be made to prevent back flow of the expellant gas.

iii) Each battery of N2 cylinders would be connected to a common manifold with necessary valve regulators etc.

5. DESIGN AND CONSTRUCTION

DESIGN OF DCP VESSEL

a) Each vessel would be provided with a blow valve or similar device to discharge excess N2 Gas in the atmosphere even if the vessel is full with dry powder. The excess gas would not affect the DCP.

b) The DCP vessel would be so deigned that the total discharge from each vessel is not less than 90% of its total capacity. Sufficient quantity of gas would also be available to flush the entire pipelines, hand lines, monitor lines etc. after use.

c) DCP vessel shall have following constructional details as under:

i. Filling aperture with cover 150mm
ii. Man hole with bolted cover 450mm internal dia.
iii. DCP filling 150mm
iv. Drain plug 150mm
v. Safety valve 02 nos. of suitable size as per norms
vi. Pressure gauge 01 no of suitable size as per norms
vii. Isolation valve 01 no of suitable size as per norms

viii. Discharge valve 01 no of suitable size as per norms

d) An alternate independent connection from the expellant gas manifold will be provided to flush all the lines after use & the control valve for flushing the hand lines etc. will be located on the control place. The two vessels shall not have any inter connection.

e) Deleted

MONITOR

i) A long range DCP MONITOR will be mounted on an independent platform immediately behind the driver's cabin. The monitor would be capable of traversing 360° in horizontal plane. A suitable locking device would be provided to lock the monitor at the desired position while in use.

The platform shall be adequately strengthened to avoid any vibration while the monitor is in use. There shall be proper and sufficient moving space around the platform for movement of the operator.

ii) The monitor shall be capable of throwing the dry powder to a distance of not less than 40 Mtrs. in still air. The discharge through the monitor would be adjustable at 15, 25 & 40 kg/sec at operating pressure. The throw of the monitor would be manually regulated. The monitor would be connected to both the DCP containers to enable powder to be discharged from both vessels.
iii) Two hand lines connected to the rear DCP vessel will be provided with 30 M long high pressure hose fitted with trigger type pistol grip nozzle & would be mounted on a hose reel confirming to IS 5132 of sufficient size. The hose reels would be located at the rear of the appliance in an easily accessible position to facilitate quick withdrawal. The hose reel would be designed in such a manner that overrunning of the hose is prevented at all times and also prevents kinking of the hose while winding. The discharge of the dry powder from each hand lines would not be less than 2.5 kg/sec & not less than 10 M at full operating pressure.
iv) The monitor shall be provided in a manner so as to enable the operator to move it easily. The monitor shall rest on a clamp, properly secured While not in use.
v) All necessary control valves gauges etc. will be provided on the OFF SIDE of the vehicle.

6. BODY WORK

CABIN
i) Two front seats, one for officer and one for driver shall be provided in the cabin and one seat for 5 Crew members shall be provided behind the officer and driver seats. The seats shall be of good quality and latest design (bucket type seats with 100 mm thick cushions. Also good quality removable and washable seat covers shall be provided.

ii) The cabin should have four doors (2 each side). The door shall open outwards. Cabin doors shall be provided with splinter proof safety glasses and shall also be provided with their movement mechanism.
iii) First aid box made of fiberglass shall be provided and fitted in the cabin at suitable location for 10 persons & contents as per The Factories Act.
iv) Non-slip type steps and rails shall be provided in the cabin to assist the crewmembers to get in and out.
v) Provision shall be made to store two no. BA sets in the back rest of the driver, officer and the crew seats with suitable clamps and brackets where the BA sets (single cylinder) shall rest and shall not be kept in a hanging condition.
vi) The crew cabin structure shall be so designed so as to avoid any vibration/rattling/deformation in the intended usage of vehicle.
vii) Two numbers of large sun visors and rear view mirrors shall be provided on each sides.
viii) The entire floor of the crew cabin shall be provided with 3M-make Vinyl matting of minimum 6mm thickness with anti-skid features.
ix) Cabin shall have one roof light and two sidelights

7. CONTROL PANEL

Adequately illuminated control panel shall be provided at easily accessible position to operate the dry powder system. All control/items of equipment shall be clearly marked or identified by fixing suitable labels to facilitate easy operation.

The control panel shall include the following:

a) Pressure gauge for expellant gas cylinder.
b) Pressure gauge to indicate operating pressure
c) Operating levers for
    i) Expellant gas valve
    ii) Monitor valve
    iii) Valves for hose reels
    iv) Pressure release valve
    v) Flushing valve for monitor
    vi) Flushing valve for hose reels
d) Switches for lighting arrangement.
e) Instruction plate for operation, with line diagram

8. OTHER CONSTRUCTION DETAILS

1. The rear structure would be made out of 40 x 40 mm square tubes of 3mm thickness. The structure of the cabin would be from 14swg MS pressed sections duly treated for anticorrosion.

2. The complete outside panelling would be done from 16g aluminium sheets & internal panelling would be from 18swg aluminium- chequered plates. The panelling on the cabin roof would be from 18swg aluminium sheets.

3. The entire flooring of the vehicle would be covered with 10swg aluminium chequered plates. The roof of the rear body would be covered with 16swg aluminium-chequered plates.

4. The DCP Tender would be supplied complete with initial charge of BIS marked 2000 Kg Dry Chemical Powder as per IS- 4308.

5. The appliance shall be fitted with a towing arrangement at the rear of adequate strength to carry one tone trailer.

6. The unit shall be well balanced on the chassis and shall have centre of gravity as low as possible. The overall height shall not exceed the permissible limits.

7. In addition to the enclosed accommodation, riding position shall be provided for 2 persons on a platform at the rear of the appliance, Grab rails and non skid steps shall be provided, wherever required to assist the crew to mount and dismount.

8. All light fittings at the rear shall be suitably protected by expanded metal to prevent damage due to movement of crew.

9. LOCKERS

1. Sufficient number of lockers for the storage of the equipment, tools and other items shall be provided. The lockers shall be fitted with waterproof lining.
2. The cab and the lockers shall be of composite construction with sufficient rigidity and reinforcement and shall be kept as light as possible. Pressed sections of sufficient strength shall be used for the super structure.
3. All lockers shall be provided with internal automatic on-off lighting system with a master switch in Driver / Crew cabin.
4. The doors of lockers shall have efficient means for holding the closed by flush fitting spring loaded lockers.
5. The doors of side lockers shall not be hinged at the bottom.

10. EQUIPMENTS AND ACCESSORIES

The appliances shall be provided with the equipment detailed to Appendix-'A' & Appendix-'B'.

The following accessories shall be fitted/ provided in addition to those normally fitted on commercial vehicles:
a) Electrically operated siren - 1 km working on the batteries of the appliance, with its switch in the driver's cab. The siren shall be fitted at a position where it is protected from damage due to weather conditions.
b) Fog lamps – 02 Nos.
c) Reversing light- suitably situated to assist reversing.
d) Search light - adjustable to give flood or beam light, mounted in a convenient position but capable of being readily disconnected and mounted on a tripod away from the appliance; complete with tripod and with not less than 30 m of TRS cable on Ii reel mounted on the appliance. The capacity of the cable shall be such that the voltage drop shall be not more than 2V at the other end.
e) Spot light - adjustable, mounted in a convenient position on the rear side of the driver's cab.
f) Inspection lamp - protected type, on wander lead with plug. A socket shall be provided on the control panel in the driver's cab for plugging in the lamp.
g) Tools - all tools required for routine maintenance of the appliance which are not included in the standard kit of tools for the chassis.
h) Wind screen wipers - two, electrically operated.
i) Operation Manual – Three sets.

11. PAINTINGS & MARKING

PAINTINGS:

The entire appliance shall be painted in DUPONT make "FIRE RED" paint & thickness of 0.12 to 0.2mm, using double coat spray painting on the outside. Lettering work in yellow color on both sides of DCP Tender as given below:
1. The whole vehicle shall be painted internally and externally with zinc chromate undercoat and sufficient number of finishing coats.
2. The driving compartment and the inside lockers shall be painted in pale cream.
3. The chassis and wheel articles shall be painted Black.
4. Owner's emblem in original colour together with name (in Hindi and English) as given below shall be written in golden yellow colour on both sides of the Vehicle. CISF and PSU's emblem will be painted on both sides with details in words in between emblem.

MARKING:

Each appliance shall be clearly and permanently marked with the following information:
a) Manufacturer's name or trade-mark
b) Year of manufacture.
a) Engine and chassis No., and
b) Capacity of DCP Vessels

12. ELECTRICAL SYSTEM

1. All the wiring will be properly fixed in position & will be protected against heat, oil and physical injury. Wherever, necessary wiring will pass through conduits. All electrical circuits will have separate fuses suitably marked & grouped in common fuse located in an easily accessible position.
2 All important electrical circuits shall have separate fuses, suitably indicated, which shall be grouped into a common fuse-box located in an accessible position in the driver's cab fitted with means for carrying spares fuses
3. Provision will be made for min. 4 spare fuses in the Box provided in driver cabin. All controls for electrical system will be provided in front of driver's seat. Battery will be placed in totally enclosed box.

13. PUBLIC ADDRESS EQUIPMENT

Grand make latest type battery operated lighting bar and multi-tone hooter/mike with amplifier & flashing light Beacon system with strobe should be provided. A light Bar of min 1700mm long operated on 12/24 Volts battery

having 2 Nos. rotating Red Beacons lights, 4 Nos. Halogen lights, 4 Nos. strobe, hooter and PA system in built amplifier and a microphone shall be provided in front of officer's seat in the Drivers cabin. The Model of PA system shall be AHUJA/PHILIPSNENUSVOICE or any reputed make and shall be of minimum capacity of 75 watts.

SPECIAL TERMS & CONDITIONS:

1) Full contract value will be released within thirty days after receipt of complete DCP Tender at site. However, party has to furnish bank guarantee of ten percent of Purchase Order value valid for 18 months. (Performance Guarantee Period)

2) Delivery period of the complete DCP Tender is eight months from the date of receipt of purchase order from NTPC, Kahalgaon.

Approx. time frame for Purchase of TATA chassis / equivalent chassis and transport of chassis to agency's workshop is three months.

Approx. time frame for Fabrication of body and equipment at agency's workshop is five months.

At the time of final delivery DCP Tender should have filled DCP vessels i.e. 2000Kgs of DCP is in scope of agency.

3) Pre dispatch inspection of chassis at TATA MOTORS or equivalent dealer stockyard in Bihar state to be carried out by NTPC Kahalgaon representatives from Auto Base and/or MM-Offsite maintenance in presence of representative of agency.

Prior intimation at least 15 days in advance to be given. TATA MOTORS / Equivalent Quality plan to be submitted by agency for approval of NTPC Kahalgaon FQA department.

Inspection during fabrication : Successful agency should submit quality plan as per relevant IS Codes provided in PR specifications for approval by NTPC Kahalgaon FQA Department with assistance from MM-Offsite Maintenance and CISF, FIRE WING.

The 1st stage (Construction of under structure, DCP tanks. Placement of the DCP tanks, lockers etc.)Inspection as per QP shall be carried out by the NTPC and CISF Fire Wing. Similarly, Second and Final Stage inspection will be carried out by NTPC and CISF Fire Wing. Both the tests shall be carried out at vendor’s premises.

Testing / inspection facility shall be provided by the vendor at the time of joint inspections. Prior intimation at least 15 days in advance shall be provided each time.

Final inspection shall be carried out at NTPC Kahalgaon store after receiving of the material.

4) Transport of chassis to agency's works and final delivery of DCP Tenders to NTPC, Kahalgaon will be in vendor's scope. However, necessary road permits shall be collected from NTPC Kahalgaon as per requirement.

Temporary registration and transit insurance required till supply of DCP tender to NTPC-Kahalgaon will be in scope of agency.

5) The manufacturer shall provide guarantee/warrantee for the design, material, workmanship and the performance of the unit for a period of 18 months from the date of supply or 12 months from the date of commissioning of the vehicle whichever earlier.

The vendor without any extra cost shall rectify any mechanical defect, faulty workmanship or operational defects found during this period.

For chassis and engine TATA MOTORS / Equivalent standard warranty to be applicable.

However, special arrangement shall be made by dealer of TATA MOTORS / equivalent for arranging in site servicing of Engine and chassis at NTPC, KAHALGAON during standard free services.

6) ACCEPTANCE TESTS
Acceptance test shall be carried out as per BIS standards in practice. Prior to dispatch of fire tender the vendor's site / workshop the following tests shall be carried out as acceptance test.

ROAD TEST
a) Acceleration & Performance Test
b) Braking Test.
c) Turning Circle Test

STABILITY TEST
a) Under fully laden vehicle (including crew) to the designed payload conditions.
b) Vehicle shall pass Overturning Test
i. The stability of the appliance will be such that when under fully equipped & laden condition, if the surface on which the appliance stands is titled to either side, the point at which over turning occurs is not passed at an angle of 27° from horizontal.
ii. The bidder should carry out this test on Mechanical Tilt Platform facility in their own works. This test will be carried out in the presence of CISF Fire Wing representative and management officials.
iii. All the piping will be SS & subjected to optimum hydraulic test pressure for a period of minimum 10 minutes.

7) After sale service: Equipment shall be serviced free of cost at regular intervals by the party during guarantee period of 18 months including in site replacement/repair as per requirement. The appliances must confirm IS specification 10993-2015.

Vendor should mention the availability of TATA MOTORS / OTHER MANUFACTURER service center within 50kms from NTPC, Kahalgaon for servicing of engine / chassis as per requirement.

8) Demonstration of the equipments in DCP Tender & training in operation of their systems to be provided to Fire Service Team of CISF Unit, NTPC, Kahalgaon at the time of final delivery.

9) Required chassis shall be purchased by the vendor in the name of NTPC Ltd, Kahalgaon from the state of Bihar and shall be delivered after complete fabrication of DCP Tender to NTPC, Kahalgaon along with following documents :

a. Chassis invoice (Purchased in the state of Bihar with GST) in the name of NTPC, Kahalgaon.
b. Form 21 (Sale Certificate from OEM of chassis).
c. Form 22 (Road worthiness)
d. Valid Temporary Registration certificate of chassis in the state of Bihar (Bhagalpur RTO).
e. Any other documents required by statutory authorities.

Permanent Registration of vehicle will be in NTPC, Kahalgaon scope.

10) NTPC Kahalgaon will provide following documents as and when required:

a. Authorization towards collection of chassis on behalf NTPC-Kahalgaon.
b. Bihar Way Bill for transportation of chassis and complete vehicle

11) The fabricated vehicle shall meet all the regulations with respect to motor vehicle act / RTO regulation enforce.

12) Deleted

13) Mandatory Spares for two years operation of Fire Tenders shall be supplied by the Vendor.

14) INSTRUCTION BOOK, ACCESSORIES AND EQUIPMENT

Instruction Book - Instructions book for the guidance of the user, including both operating and normal maintenance procedures shall be supplied. The following documents should be necessarily enclosed.

i) General Arrangement Drawing of the above DCP Tender
ii) Drawing of DCP Tank
iii) Flow Diagram
iv) Electrical Circuit Diagram.
v) ISO 9001 Certificate
vi) DGS&D Certificate all other related certificates.
vii) Catalogue.

Documents to be furnished by the vender along with the dispatch of material:

i) Performance certificate for the equipments if any
ii) Warranty Certificate
iii) Line diagram
iv) Maintenance Manual (This manual shall contain fully illustrated instruction on repair and overhaul of the super structure with details of fitment, tolerance and special tools to be used, and procedure for dismantling and assembly checks.
v) Material test certificate critical equipment/fittings.

15) Others:

a) The tenderer shall furnish the clause-by-clause compliance statement as per specification.
b) In case there is any deviation the same should be clearly brought out in the offer.
c) The tenderer shall indicate the make/model in their offer.
d) They shall mention the relevant BIS/EN/ NFPA certificate of the product offered.
e) Relevant Test certificates shall be provided from a Govt. Approved laboratory or from the manufacturer, along with their offer, if the supplier is not a manufacture of the item. They shall submit valid authorization letter from the original manufacturer of their Indian corporate office along with offer.
f) All equipment being quoted by vendor shall confirm to the latest version of relevant Indian/ International standard.
g) Vendor shall mentioned the relevant standard reference against each items governed by the Indian/ overseas international standard.
h) Vendor shall agree to provide certificates in original of all necessary or mandatory approvals in respect of the fire Tender before dispatch.
i) Along with techno-commercial offer, vendor shall submit a separate sheet listing all items (Installed on DCP Tender) that shall be supplied. i.e. scope of supply shall be mentioned.
j) The tool kits for maintenance shall be supplied along with the product.
k) Technical manual comprising of servicing details shall be supplied with equipment.

16) Minimum list of mandatory spares parts, to be supplied with DCP tender in addition to mentioned in technical specification, is mentioned below.

1. CONTROLLER REGULATOR - 01 NO
2. CHECK VALVE SS-02 NOS
3. HP RUBBER PIPE WITH FITTING CONNECTION FROM CYL TO MMANIFOLD-02 NOS
4. HP RUBBER PIPE WITH FITTING CONNECTION FROM MMANIFOLD TO VESSEL, HOSE REEL-02 NOS
5. 1/2 INCH BALL VALVE-02 NOS
6. 1 INCH BALL VALVES-02 NOS
7. SILENSOR-3 NOS
8. PR. GAUGE-02 NOS
9. FILLING ORIFICE GASKET OF VESSEL-02 NOS
10. WASHER FOR HIGH PR RUBBER PIPES, HOSE REEL VALVE AND FLUSHING VALVE- 04 NOS EACH

However, complete list of mandatory spares is to be submitted by agency along with bid including all of the above mentioned spares.

17) Below mentioned Appendix-A (list of tool kits items with box) & Appendix-B (LIST OF ACCESSORIES TO BE SUPPLIED WITH THE VEHICLE and their specifications) are part of technical specification.

APPENDIX- A

LIST OF TOOL KIT ITEMS WITH BOX

S. No.	Items Descriptions	Quantity
1.	Screw / Adjustable wrench - Taparia Make	02 Sets
2.	Cutting Plier - Taparia Make	02 Nos.
3.	Pipe Wrench 18" - Taparia Make	02 Nos.
4.	Pipe Wrench 26" - Taparia Make	02 Nos.
5.	Screw Driver (6", 8" & 12") - Taparia Make	02 Each
6.	Ring spanners 8 Nos. - Taparia Make	01 Set
7.	Wheel Spanner with Rod	01 Set
8.	D-spanner 8 Nos - Taparia Make	01 Set
9.	Hammer 500 Gram- Taparia Make	01 No.
10.	Hydraulic jack — suitable capacity	01 No.

APPENDIX- B

LIST OF ACCESSORIES TO BE SUPPLIED WITH THE VEHICLE and their specifications

S. No.	Items	Quantity
1.	Spare expellant gas cylinders each of same size & capacity as provided in DCP tender, filled with gas.	04 Nos.
2.	Portable Hand operated Siren as BIS- 6026/1985 / EN specifications	02 Nos.
3.	Stretcher Molded type (as per IS : 4037-1967)	04 Nos.
4.	Portable mega phone / Wireless Amplifier (WA-320) with all accessories of good reputed Company made by original manufacturer.	02 Nos.
5.	Shears (bolt cutter)	02 Nos.
6.	3 strand 14 mm Poly propylene rescue rope	04 Nos.
7.	Cutter Tin Heavy Duty 250mm	02 Nos.

Sl.	Name of the item / Product Description	Technical Data / Specifications
1.	Spare expellant gas cylinders each of same size & capacity as provided in DCP tender , filled with gas	N2 cylinders should be CCE approved & ISI marked (IS 7285)
2.	Portable Hand operated Siren as BIS/EN specifications	As per IS-6026/1985 / EN specifications and latest amendments
3.	Stretcher Molded - HDPE Spine Board/backboard Stretcher with two handles at a tapered end (as per IS : 4037-1967)	Dimensions: • Product Size (L x W x H) -185 cm. X 45 cm. X 6 cm. • Self-Weight - 8 Kg. • Load Limit - 159 Kg. • Gross Weight - 10 Kg. • Two handles at tapered end to allow for more stable transport. • Head area is smooth to ensure all head immobilisation devices adhere to the board. • Angled edges for log –rolling. • Floats 70 kg. In water. • One-piece, HDPE (high-density, polyethylene) plastic construction, with polyurethane foam fill and greater density around the handholds. • Impervious to all bodily fluids. • 100 % X-Ray translucent. • All board meets OSHA recommendations and is easy to decontaminate. • Guaranteed for life under normal usage.
4.	Portable mega phone : Wireless Amplifier (WA-320) with all accessories of good reputed company made by original manufacturer.	• Power Output - 20 W Rated / 25 W Max. • Voice Range - Clear sound, long range 0.4 km (01 km in quite area) • Power Source - In-built rechargeable lithium battery 12V AC/ DC, /Dry cell • Microphone:- unidirectional • Weight - Light weight ,Not more than 3.0 kg • Body - All ABS body, sturdy yet lightweight. • Siren - Built-in siren. • Volume switch- Conveniently located volume control & switch Anti-feedback. Microphone with volume Control & Press-to-talk Switch. • Hanging protection on shoulder must be provided. • Guarantee/ Warranty Should specified period not less than 12 month from date of receipt.
5.	**Bolt Cutter /Shears**	• Length 30” • cutting jaws : made of high tensile solid alloy steel, specially • heat treated with centre cut head • Handle : With sufficient grip of rubber fro a length of 6 to 8 inches • Application : Suitable for cutting hard material viz. bolt, iron rod of 10 to 14 mm diameter
6.	**RESCUE ROPE PP** 3 strand 14mm PP Rope (35 Meters)	Three strand 14mm Dia PP Rope having breaking strength of more than 3050 Kgf. • High strength and Low weight • Highly resistance to acid and alkalis • Float in water , does not absorb water • Low elongation and better knot ability

7.	**Cutter Tin Heavy Duty** 12-15 inches	Digital Craft GE-TECH Heavy Duty Sheet Metal Hand Steel Cutting Tin Snips Scissors Cutters Snipers Professional Metal Cutter. Size : Length 250mm - 300 mm Application: For cutting tin sheets of small thickness

TECHNICAL SPECIFICATION OF FOAM TENDER

1. CHASSIS

The Foam Tender shall be fabricated on a suitable 16 Ton (4 x 2) – BS-VI or Latest emission norms, Cowl Chassis with 4700 mm Wheel Base & 180 HP Engine of Ashok Leyland/TATA or any other similar and reputed manufacturer. Drag hook or eye of adequate strength and design shall be provided at the rear & front side of chassis by the vendor.

2. GENERAL

The Foam Tender including all its accessories & equipments is required for the Department. It shall be designed & manufactured in strict compliance with the specifications given below, as well as other relevant Indian/ International standards where applicable & as per sound engineering practices. The Foam Tender shall be designed to effectively & efficiently carry 5,000 litres of Water & 500 litres of Foam, a Godiva/ Rosenbauer or equivalent (CE certified/ UL listed) pump with a discharge capacity of 4000 lpm @ 10 kg/cm^2 driven through heavy duty Power Take Off (PTO) units, a Water Monitor of approximately 1000 GPM (US), equipment, accessories, etc. All the equipments & accessories shall be fixed on the appliance in a compact, neat & ergonomic manner and shall be easily & readily accessible for immediate use during emergencies. Due care shall be taken to ensure that all aggregates are designed for ease & comfort of the operator. The Foam Tender shall fulfill the requirements of BIS:10460.

3. DESIGN & CONSTRUCTION

The Foam Tender shall be designed to be as compact as possible with ease of accessibility to all the service parts. The pump & other equipment controls shall be so arranged that user can operate them easily & conveniently. Lever type valves shall be preferred unless impractical in any way. The Foam Tender shall be supplied complete with all the equipments & accessories mentioned in these specifications. The MOC (materials of construction) shall be used with a view to combine lightness with strength & durability. No form of wood, (timber or ply) shall be used anywhere in the body construction. All parts which form water ways, come in contact with water or are made from materials that are prone to corrosion, shall be treated with a good quality anti-corrosion system/ treatment/ paint (epoxy coats)/ zinc coating, etc. The vendor shall submit weight distribution chart along with design of supporting structure along with design calculations to the department along with the technical bid, failing which, the bid shall be summarily rejected.

4. PUMPING SYSTEM

The pump fitted on the Foam Tender shall be a Godiva/ Rosenbauer or equivalent (CE certified/ UL listed) with CF8/GM. The centrifugal pump shall be capable of delivering not less than 4000 lpm @ 10 kg/cm^2. The quoted Fire Pump shall be CE certified to EN 1028-1 and 2, its subsequent amendments (2008 or above) with EN 1050 and ISO 14121. Fabricator shall provided five (05) years warranty and after sale service letter from OEM along with tender documents. Fabricator shall not make any modification (manifold, etc.) in pump and shall provide pump having 4 deliveries from OEM. Fabricator shall provide the warranty and after sale service letter from OEM along with tender documents. The warranty shall come into effect from the date of supply of Foam Tender. The OEM priming system shall be twin piston reciprocating type with an additional Exhaust ejector or Water-ring type primer, which shall be capable of lifting water from 7 m depth within 30 seconds when tested. The primer shall be capable of working even if left dry over extended periods. The pump shall be of rigid construction & shall be modularly designed for ease of maintenance. It shall be capable of delivering its full performance with all strainers (external & internal). The details of the pump such as its make & model, supported with catalogs/ brochure/drawings, etc., shall be attached with the offer. The discharge of the pump shall be routed to the outlets for hand lines and monitor fitted on the top. The other construction details shall be as per the following specifications.

4.1 Pump Suction Inlet

The suction inlet of the pump shall be capable of being connected either directly to hydrant discharge outlets through headers or to the water tank of the vehicle. It shall be of a suitable size to give the rated output of the pump, but not less than 140 mm. The inlet shall be of male round-threaded type & provided in such a way that it is convenient to take water from outside sources like open wells with metal type removable strainer. The connection from the water tank to the pump shall be suitably sized (min 150 mm) to allow full pumping at the rated output. A ball/ butterfly valve of good quality shall be fitted between the suction inlet of the pump & the water tank. Stainless Steel strainer shall be fitted inside the tank on the pipe outlet to pump.

4.2. Pump Discharge Outlets

There shall be 4 outlets of standard size (63mm) with screw down type delivery valves, having female instantaneous couplings. The pump shall have multi volute design for required pressure. Fabricator shall not make any modification (manifold etc.) in pump and shall provide pump having 4 deliveries from OEM. A ball/ butterfly valve of good quality shall be fitted at the starting point of the water flow to the monitor. A second valve shall be provided at a suitable place near the base of the monitor. This is to ensure that in case of a leakage at any time in the first valve, the second valve fitted near the monitor base shall hold the pressure.

4.3. Pump Mounting

The pump shall be rear mounted to ensure maximum hydraulic efficiency when working from open water sources. It shall be mounted in such a way that vibrations from the drive line are not transmitted to the control panel. The pump shall have at least four mounting points to ensure that the complete load of the system is evenly distributed. The mounting shall be done on heavy "C" channels/ plates only. The mounting shall be secured to the chassis members by bolting. Welding of the mounting shall be strictly avoided. The rotating drive flange shall be provided with a cover/ guard so that injury is minimized during operation or maintenance of the pump. The guard shall be bolted and easily removable.

4.4. Pump Material of Construction

The Pump body/ casing, impeller, delivery outlets, etc shall be made of CF8/GM. The wearing rings & other parts that may be subject to frequent wear shall be of renewable type. The impeller shaft shall be of SS confirming to IS: 6603 & shall be carried in anti-friction bearings as per the pump manufacturer's standard design. The impeller neck rings & impeller rings shall be renewable type. The bearing housing shall be of Cast Iron for better heat dissipation. An easily accessible drain valve made of SS-304 shall be provided at the bottom of the casing to enable easy draining of the complete system.

4.5. Pump Shaft Sealing

The shaft sealing shall be of self adjusting type. The sealing system shall be as per pump manufacturer's standard design. The mechanical seal assembly shall with stand dry running of pump up to 2 minutes without any damages.

4.6. Pump Control Panel

The pump control panel shall be supplied and designed keeping in mind ease of operation as well as maintenance. The control panel shall be ergonomically designed with the following:

(i) Pump to Delivery Outlets
(ii) Pump to Monitor
(iii) Pump to Tank Filling
(iv) Foam Tank to Pump
(v) Pump to Cooling line
(vi) Tank to Pump Suction
(vii) Outside source to Pump suction
(viii) Water Level Indicator
(ix) Throttle Control for engine
(x) Foam Level Indicator
(xi) Pressure Gauge
(xii) Compound Gauge

Note: The above mentioned connections are the min. requirement. Other connections/ controls as may be required can be provided by the manufacturer. The grouping of the pipelines & valves as well as the complete system layout shall be discussed with the inspecting officers at the time of the stage inspections.

4.7. Pump Priming System

To ensure that the priming system is compatible with the pump, only an OEM (pump manufacturer) supplied priming system shall be incorporated with the pumping system. The OEM priming system shall be twin piston reciprocating type with an additional Exhaust ejector or Water-ring type primer, which shall be capable of lifting water from 7 m means shall be provided to automatically limit the engine RPM to the manufacturer's recommended speed. The primer shall get automatically disengaged once the pump is registered the pressure. The system shall be maintenance free to the extent possible & shall be constructed of suitable materials to prevent corrosion due to salty/ brackish water.

4.8 WATER MIST SYSTEM CLUBED WITH COMBINED FOAM FIRE TENDER:

An ultra high pressure pump shall be provided with a capacity of 150 LPM @ 100 bar with 02nos hose reels each 45 mtr. length, lancing distance for jet shall be around 12 to 15 mtr., lancing distance for spray mode shall be approximate 6.5 to 7 mtr., weight of the gun shall not be more than 1.5 kg. A separate PTO shall be provided for operation of water mist system in fire tender running condition also. Water mist system shall be provided as per IS specification.

5. POWER TAKE OFF

The PTO for the pump shall be of VAS/ FIRE HAWK/ HALE/SYALL of suitable ratio for the rated output of the pump & the torque of the vehicle. The lever/switch for engaging the P.T.O. shall be provided in Driver's cabin. Inspection/ maintenance hatch of removable type shall be provided at suitable places for gaining access to gear box/ PTO. Necessary modifications, to the standard drive system as available on the chassis, shall have to be done by the vendor so as to adopt the PTO Units in the system. Necessary supports for PTO Units, propeller shafts coupling, universal joints etc. for power input to and output from PTO Units shall have to be provided by vendor. The drive assembly components (shafts, coupling etc) shall be dynamically balanced and the vibration at any of the rotary parts shall be minimized.

6. COOLING SYSTEM

In addition to the radiator cooling, an indirect cooling system of the open circuit type shall be provided if required to keep the engine from overheating during extended use in tropical climates & when the ambient temperature is over 40° C. The cooling system shall be so designed that the full power output of the engine can be maintained during continuous stationary running without overheating. The operating temperature of the engine cooling water shall be thermostatically controlled. The oil in the sump shall be prevented from overheating & the pump characteristics shall be chosen in a manner so that the engine does not run at its maximum speed for the required output. The cooling water outlet pipe from P.T.O. & additional cooling tank/ heat exchanger shall be connected through a suitable diameter pipe. The end of the pipe shall terminate in a threaded connector.

7. AUXILARY ULTRA HIGH PRESSURE PUMP UNIT

The pump shall be of 150 lpm @ 100 bar rated capacity. It shall be a six plunger positive displacement type pump, working to its capacity at not more than 1000 RPM. A by-pass for letting the water back to the tank shall be provided to release excess pressure generated due to shutting of the hand lines. The pump shall have double seal on each plunger with low pressure intermediate chamber to keep the water seals cool and lubricated. This system will also permit the recirculation of any leakage from the high pressure back to the pump inlet. The pump shall have synthesized pistons of ceramic. The connecting rods will be of special alloys with low attrition coefficient, high wear resistance and high anti-seize properties. The hydraulic structure will be designed to simplify scheduled maintenance procedures like gasket and valve replacement. The pump suction line shall have inline mesh filters. The pump shall deliver water to the hose reels.

7.1 Hose Reels & Fog Guns

The high pressure pump will operate through 2 separate hose reels of 30m length each, and will be provided at a suitable place on the appliance, one on each side. The hose used for the hose reels would be R2 type rated for a minimum working pressure of 270 bar & will be of min. 16 mm ID (internal diameter). The unit shall be equipped with two Fog Guns which shall be capable of discharging 65-75 lpm @ 100 bar in mist mode. The jet range shall be approx 30 m (in still air condition). These Fog Guns shall have a Jet as well as Fog mode. The hose reel as well as the High Pressure Nozzle shall be CE Certified.

8. WATER TANK

The Water tank shall be of min. 5000 ltr capacity & shall be suitably mounted on the chassis in such a way that the weight distribution is optimized. In addition a 2% expansion space shall be made in the tank over & above the water capacity. The tank shall be fabricated out of SS 316 plates of min. 5 mm thick for the bottom & 4 mm for the sides. The top & baffle plates shall be of 3 mm. The tank shall be of welded construction & shall be die-pressed on all sides to prevent distortion & to ensure torsional rigidity. Due care shall be taken to ensure that butt-weld joints are minimized. Wherever butt joints are unavoidable, they shall be radio-graphically tested. The test films & reports shall be submitted at the time of stage inspections. All other joints shall be DP tested for soundness of weld joints. Complete welding shall be done using Gas Tungsten Arc Welding (GTAW) process with ER 304 electrodes.

8.1. Baffles

The tank shall be suitably baffled longitudinally and transversally to prevent surge when the vehicle is cornering or braking. The baffle plates shall be of minimum 3 mm thickness bolted type. The fasteners used shall be SS material only so that they do not freeze due to rusting. The nuts shall be tack welded to the baffle plates. The baffles shall be so designed that they do not buckle under any circumstances during braking cornering or accelerating. The baffles shall be arranged in a manner to facilitate easy cleaning of the tanks.

8.2. Tank Mounting

The water tank shall be mounted on the vehicle on a sub-frame using Rubber Metacones. This sub frame shall be made from Anti-Corrosive Treated MS 4" section and shall be bolted with the chassis using the high tensile bolts. 'U' Bolts shall not be used for mounting of tanks on vehicle. The rubber metacones shall facilitate to absorb the jerks and bending torsions in expansion as well as compression mode without high deflection. The manufacturer shall provide complete design data of metacones and sub-frame including the load calculations and metacone quantity sufficiency. Tank shall be mounted on the chassis in a manner keeping in view the proper load distribution on the axles. The tank shall be mounted on two/ three cross bearers to counteract stresses caused by chassis flexing. The Centre of Gravity shall be maintained as low as possible. The mounting shall permit the full contents of tank to flow to the pump. The bottom of the tank shall be sloped towards rear. Suitable hooks/ lifting eyes shall be provided on top of the tank to enable it to be lifted off the vehicle for maintenance/ repairs. The bottom of the hooks shall be suitably reinforced with pads to avoid stress on the tank top plate. Sides of tank shall be die-pressed to give additional strength & stiffness so that it does not distort due to chassis flexion.

8.3. Connections for Filling

The tank shall have a filling orifice of 250 mm and an inspection & maintenance manhole of 450 mm at the top. The cover for this port shall be of hinged or threaded type as per the manufacturer's standard design & shall be clearly marked with the words (either etched or raised) "WATER". This port shall be used for filling the water tank from overhead storage tanks. Apart from the above, two more filling connections shall be provided on the sides of the tank terminating in filling connections of 63mm male instantaneous couplings made of GM or SS material incorporated with a strainer. The header & the line shall be suitably designed to ensure that the inflow of the water into the tank is sufficient to maintain the output of the pump while the tank is being replenished from other vehicles or from hydrant lines. These connections shall be fitted with a valve to prevent water leaking through the filling pipe & shall be provided as close to the pump as possible. Valve may be of NRV / Ball / butterfly type. One connection shall also be provided for filling tank from pump itself. Connection shall be taken from pump manifold & shall be controlled by a shut-off valve.

8.4. Draining, Cleaning & Repairs

A 50mm diameter drain line with a ball/ butterfly valve shall also be provided to drain the tank for maintenance/ cleaning/ repairs etc. A cleaning hole of 250mm shall be provided at the bottom of the tank & shall be taken down to a point below the chassis without reducing the effective ground clearance. The connection shall ensure that the water is discharged as far away from the wheels of the vehicle as possible, to reduce the chances of tyre slippage. Suitable lifting lugs shall be provided on the shell of the tank to enable it to be lifted off vehicle for repairs/ replacement as necessary.

8.5. Overflow

One overflow pipe of suitable diameter shall be fitted to the tank. The diameter of the overflow pipe shall be determined as per the filling connections provided. However it shall not be less than 100 mm diameter in any case. In case the inlets provided at the sides are more, the overflow pipe diameter shall be suitably changed to accept the additional flow. As a thumb rule, the diameter of the overflow pipe shall be two times the sum of all incoming pipes. For example, if there are two header pipes are of 100 mm diameter each, the overflow pipe shall be of 200 mm diameter. This is to ensure that the tank does not get unnecessarily pressurized. The overflow pipe shall be taken up to 2 inches higher than the top of the vehicle from the inside of the tank & shall be cut at an angle of approx. 45 degrees.

8.6. Miscellaneous

The tank shall be connected to the Pump with a butterfly valve for ease of operation. The tank shall be hydraulically tested at 0.5 kg/cm^2 pressure to find out if there are any leakages. This test may be carried out in the presence of the inspecting officers or done by the manufacturers as per their own internal quality program. However due care must be taken to keep all records of such tests for verification at the time of final inspection. The inlet line in the tank shall have an adequately strong deflector plate, which shall avoid the incoming jet of water from hitting the tank side/roof. All plumbing shall be reasonably accessible for maintenance purposes. Screwed bends, joints shall be avoided as far as possible. All the joints shall be flanged type & shall have O ring sealing. Rubber gaskets shall not be used anywhere in the plumbing. All the outlets and inlets from the tank shall be taken by installing nozzles of suitable length and reinforcement pads.

8.7 Electronic LED Indicators

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

8.8 CABLE WINCH

An electrically operated cable winch of Ramsey / Rotzler / Sepson make or equivalent having capacity of not less than 6.5 tons pulling capacity (single layer) should be provided and mounted in the front of the vehicle. The winch unit should be complete with minimum 5.5 hp 12v DC series wound electric reversible motor for increased pulling power. The motor and solenoids shall be grounded to the battery. It shall have an automatic load holding brake system for more strength. For free spooling the clutch design shall be easy to use type with spring loaded pull and rotate system. The gear system should be 3 stage planetary type for faster line speed and the gear reduction ratio shall not be more than 300:1 the drum shall not be of more than 8 inches long having 3.5 inches dia and shall be supplied with minimum 90 ft heavy duty galvanized EIPS wire rope with replaceable self locking clevis hook and would be mounted on the front bumper of the vehicle with suitable strong support and a 4 way roller fairlead. The Weight of the winch shall not be more than 55 kgs A wireless remote for 12 V system or wired remote for 24 v system shall also be supplied with the unit.

8.9 **TELESCOPIC LIGHT MAST**

A pneumatic telescopic mast of Fireco or Will Burt mark or equivalent should be mounted on the vehicle. It should be manufactured from Anodized aluminium 6063 T6 alloy tubes and have a max diameter of 115 mm diameter on its base and complete with a foot plate 150 with up to six fixing holes for bolts. The temperature range shall be -40 C with anti- twist lock with safety valve and drainage outlet valve.

The telescopic mast should be extremely strong and designed with a minimum of 6 sections and equipped with a special plastic locking system placed on the ring between the first and the second section meant to eliminate any backlash between all the sections, once the mast is retracted. The mast should be equipped with an internal spiralled electrical cable with 9 wires with a section each of 1.5 mm2 and 13 wires with a section each of 0.22 mm2 the group of 13 wires should be screened Each section of the mast should have a thickness of not less than 3.5 mm2 For a better movement of the internal cable the last three internal pistons should be threaded to the corresponding section. The maximum height of the mast when deployed should be minimum 6000 mm (from the ground) the retracted height should be of maximum 1.900mm both heights are meant with the integrated tilt & turn unit. The working pressure should not be less than 2.5 bar and more than 3.5bar. An electro pneumatic group of valves must be supplied and mounted at the bottom of the mast with the possibility to regulate the extension speed and the retraction speed separately.

The light mast should have 4 X 1000 Watt Halogen flood light projectors in weatherproof casing. The floodlights on the top should have a minimum electrical rotation of 360* by means of tilt and turn unit with an ABS cover for inspection.

A 5 KVA portable Petrol engine operated Gen Set shall be installed at a suitable location in the rear locker and necessary wiring / connections shall be given to the light mast.

9. FOAM TANK

Tank shall be of 500 litres, fabricated from 3 mm SS 316L plates only & die-pressed on all sides to ensure torsional rigidity. Complete welding shall be done using Gas Tungsten Arc Welding (GTAW) process with ER 304 electrodes. It shall be suitably baffled & the baffle plates shall be bolted. Fasteners used shall be of SS only. Bottom of tank shall be sloped towards the rear. It shall have a filling orifice of 150 mm & an inspection manhole of 450 mm. One additional filling connection of 50 mm shall be provided on the sides of the tank with a ball valve for replenishing/ filling the tank from an outside source. The tank shall be fitted with sludge trap with a cleaning hole of 250 mm dia & a 50 mm drain pipe with a valve & plug incorporated in it for maintenance, a system for ensuring that sludge does not enter into the pipeline (so that the foam system does not get clogged), shall be provided. The tank shall be provided with automatic venting & the breather shall be provided on the top. The breather valve shall ensure that it does not get frequently clogged. The material shall be either GM or SS only. Tank shall be hydraulically tested at 0.5 bar for leakage. All joints shall be flanged type & have 'O' ring sealing only. All weld joints shall be radio graphically tested & test films & reports shall be submitted at the time of stage inspections.

9.1. Foam Proportioner

An around the pump Foam Proportioning system (RTP) with a selector valve to induce 3% to 6% of foam compound shall be provided. The proportioner shall be installed in such a way that it shall not be liable to mechanical or other failures. The selector valve shall have three settings. Each upward setting shall result into an equal increase in the foam compound flow rate. The linkages of this purpose shall be as simple as possible to avoid distortion due to chassis flexion. It shall be reliable & shall not require frequent calibration checks. The proportioner RTP type shall be duly calibrated & supplied by the pump manufacturer only.

10. PIPING & VALVES

Complete pipeline circuit on the vehicle including water lines & fittings shall be of SS316 material only, including all water lines. All valves (AUDCO/L&T) up to 2" size shall be lever operated SS316 ball valves & all valves above 2" size shall be normal ball/ butterfly valves but made of SS316. Seats of the valves shall be easily replaceable, readily available & at least 2 sets of spare seals shall be provided for each size of valves. All the lines shall be tested hydraulically for at least 3 times the working pressure or 1.5 times the working pressure of the pump. A flow chart and schematic diagram shall be made and submitted with the technical bid failing which the bid shall be summarily rejected.

11. FOAM/ WATER MONITOR

Foam Monitor having discharge capacity of 1000 GPM (US) @ 7 bar shall be mounted on the top of the fire tender in such a manner that it can be operated by a crew member. The monitor shall be capable of traversing through 360° in horizontal plane, elevating from horizontal to 75° and depressing from horizontal to not less than 15° and fully rotation in both directions. Monitor shall be TFT/ AKRON/ ELKHART/ ROSENBAUER. The monitor shall be UL listed capable of discharging water to an effective distance of not less than 75m & projecting the foam discharge to an effective distance of not less than 45m in still air conditions when operated at rated pressure. Monitor shall be provided with Jet / Spray type Nozzle. The MOC of the Monitor shall be Cast Stainless Steel (CF8)/GM. Fabricated Stainless Steel Monitors shall not be allowed.

12. BODY WORK

The Foam Tender shall be supplied with original single Cabin/ Cowl with seating arrangement and doors for Driver and Officer. Further accommodation for five persons (crew members) shall be provided in the same cabin without any partition with one door on each side. Modification & extension of original cabin for fire crew including hydraulic mechanism (without partition) is to be done with permission from chassis manufacturer. All the 04 doors shall be fitted with toughened glasses and be of sliding type window. The glasses on crew cabin windows and doors shall be fixed in aluminium sections. The cabin doors shall be hinged type opening outwards & hung forward with catch latches. The cab and lockers shall be of composite construction with sufficient rigidity and reinforcement and shall be kept as light as possible. Pressed sections of 40 mm x 40 mm x 2 mm thick Corrosion Free square tubes of sufficient strength shall be used for the cabin construction as far as possible.

The rear equipment lockers superstructure (after the cabin) shall be fabricated in corrosion free/ Extruded Aluminium profile sections constructed with bolt and nut system without welding work and panelled with aluminium plate by means of glue without any welding work. **Mild Steel shall not be used in structure anywhere.**

Roof panels shall be made of aluminium padded plates. The roof shall be strong enough for being walked-on and must be sufficiently supported. The intermediate walls and shelves shall be constructed from aluminium sheets paneled to the Corrosion Free Sections/ Tubes structure by means of glue without any welding work. The outer and inner paneling of the superstructure shall be done from 3 mm aluminium sheets. The complete top of the rear superstructure would be covered with 3 mm aluminium chequered plates/ suitable anti-skid material. The sheets of the outer paneling shall be bonded/ glued to the skeleton framework. Rivets/ screws shall not be allowed. The area over the tank shall be suitably treated for slippage by chequered plates or anti-skid material. The doors of the cabin shall be fitted with toughened glasses & winding type regulators. The driver shall be provided with good quality large size rear view mirrors on both sides of the cab & convex round mirrors for overall rear view of the vehicle from top to bottom & left to right. The cabin shall be as per the latest national/ international standards & ergonomically designed so that the crew members are comfortable in transit as well as are able to use the vehicle in an efficient & comfortable manner.

12.1. Seating

The driver & officer seat shall be provided by chassis OEM. 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 shall easily come off the seats with them. The seat bottom shall be theatre type, which shall 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 seat belt release & a chrome swivel bezel. If there is space available, the seats shall be fitted with flip-up armrests. The seats shall be of Ziamatic, USA/ Seats Inc (Battalion SCBA Crew Flip Seat) or equivalent imported make only.

12.2. Lockers

Suitable lockers shall be provided for storage of equipments & accessories wherever required. Size and number of locker shall be decided at the time of stage inspections. The lockers shall be constructed in a modular way so that in case if the configuration needs to be changed, it can be achieved without major modifications. All equipment stored in lockers shall be strapped/ clamped in a neat & convenient manner so that it has an identified place. All lockers shall be suitably labeled so that each item shall have identification when it is required to be accessed. For all water fittings like branch pipes etc., quick release type couplings (GM/SS) shall be provided, which shall enable the operator to locate the desired equipment instantly & save valuable time.

12.3. Roller Shutters

For the easy operation of the Fire tender roller-shutters covering the equipment lockers shall be installed on both sides of the appliance. These shutters shall be rolled inwards underneath the roof giving unobstructed access to the equipment lockers & the equipment/ accessories fitted in the vehicle. Roller shutters shall be made of hollow rectangular shaped aluminium links which shall be inter connected with the help of plastic/ rubber profiles, sealing the roller shutter watertight when closed. They would be durable, maintenance free, weather & corrosion resistant & capable of opening in every position of the vehicle even in rough terrain & on slopes. A spring mechanism shall be fitted so that the shutters are not held up at any point of opening. It would be easy to operate & shall ensure that the shutters can be easily pulled down. The sections of the shutter shall be powder-coated to a smooth finish & aesthetic look. Guide rails shall support the shutters over the entire length on both sides & make them corrosion free. The rain protection slat shall be equipped with LED Lighting (to be provided by Roller Shutter OEM only) which will ensure that the area near the locker is enlightened. The shutters shall have a sturdy locking mechanism which shall prevent accidental opening during movement of the vehicle. A master switch for isolating locker lighting circuit shall also be fitted in the driver's cabin. The shutters shall be of MCD France/ AS Dover/ OR equivalent imported make only.

13. ELECTRICAL EQUIPMENT

Adequate lighting arrangement (approved make only) shall be made in all compartments. All equipment lockers shall have internal lighting arrangement automatically switched on and off by opening/ closing of doors/ shutters (LUMAX Make/ Roller Shutter OEM make). All the wiring shall be properly fixed in position & shall be protected against heat, oil & physical injury. To the extent possible all wiring shall pass through conduits. All wires used in the vehicle shall be stranded copper or copper alloy conductors of a gauge rated to carry at least 125 percent of the maximum current for which the circuit is protected & shall be uniquely identified by colour coding or permanent marking. Voltage drops in all wiring from the power source to the using device shall not exceed 10 percent. The use of star washers for circuit ground connections shall not be permitted. All the electrical circuits shall have their own separate fuses, suitably marked & grouped in a common fuse box, located in an easily accessible position. Provision shall be made for min. 4 spare fuses in the box which shall be provided in driver's cabin. All the controls for electrical system shall be provided near the driver's seat. The battery shall be placed in a totally enclosed box. Radio suppression of the electrical system, which is sufficient to ensure positive operation of radio equipment without interference, shall be provided. Arrangement shall be made on dashboard opposite to the fire officers' seat to fix a mobile wireless set. Power supply shall be provided from vehicle battery. Mechanism shall be provided to charge the vehicle battery from external power source.

14. SUPPLEMENTARY EXTINGUISHING SYSTEM

14.1. Dry Powder System

Two Nos. (One on each side of Fire Tender) of 50 kg capacity Dry Chemical Powder Fire Extinguisher (BIS: 16018 marked) shall be provided at the convenient position on the appliance. Dry Powder extinguisher system shall have 10m High Pressure Hose with pistol type discharge nozzle. The dry powder vessel shall be

fitted with expellant cylinder (3kg CO_2 BIS 7285 CCE approved) for discharging the powder. The dry powder containers shall be electrolytically treated for anti-corrosion. DCP (ABC Type) shall be BIS marked as per BIS: 14609.

14.2. CO_2 System

Two Nos. (One on each side of Fire Tender) of 22.5 kg capacity CO_2 cylinders BIS : 16018 marked & CCE approved) with hose reel (heavy duty) of 15m long high pressure rubber hose with discharge horn on each side shall be provided.

15. FITTINGS & ACCESSORIES

Following accessories shall be provided on the appliance:

a) Two Spot lights in front (Hella / Equivalent make)
b) Two Fog lamps (Hella / Equivalent make)
c) Four Blinker type traffic indicators (OEM supplied)
d) One Removable type search light (LUMAX / CANARA) with 30m cable & tripod stand.
e) LED Light bar min. 1200 mm wide with Aluminium Housing and max. 90 mm height with Blue and Red lighting shall be provided on top of the fire vehicle.
f) PA System & Hooter of PHILIPS/ AHUJA/ GRAND make shall be provided.
g) Blue & Red strobe lights shall be provided on both sides of the vehicle. (One between the doors and at least two on the sides after the cabin – On both sides of the vehicle). These shall be of the high intensity type with regular and intermittent flash pattern. Orange/ Amber LED Flashing Warning Light shall be provided at the rear side of the vehicle.
h) Tipping Type Ladder gallows shall be provided on the roof suitable for fixing a 10.5m heavy duty trussed type aluminium extension ladder. The design shall be such that the ladder can be released BY ONE PERSON ONLY without difficulty from a reasonably accessible position and the person are not required to climb on the roof top to remove the ladder. The ladder gallows shall be CE certified.

16. ACCESSORIES TO BE SUPPLIED WITH FOAM TENDER

Sl.	Description	Qty
1	Aluminium Extension Ladder Trussed type 10.5 m	1
2	PVC Suction Hose with Light GM Round Threaded Couplings to suit the Pump Inlet – 2.5 m	4
3	Delivery Hose IS : 636-2018 (Type-3), ISI Marked, 63 mm x 15 m with GM couplings ISI Marked.	12
4	Suction Strainer for Item 2	1
5	Basket Strainer for Item 2	1
6	Dividing Breaching controlled type (GM)	2
7	Collecting Breaching (GM)	2
8	Pair of Suction Wrench universal type	1
9	Long line (polypropylene) 50 mm circumference, 30 m long	2
10	Short line (polypropylene), 50 mm circumference, 15 m long	2
11	Hose Bandages Rubberized	12
12	Hose Clamps	6
13	Hydrant Valve Key & Bar (Set) (Combination Set)	1
14	Fog Nozzle branch with low Pressure Applicator with Fog Head	1
15	Hand Controlled Malty purpose Branch	1
16	Universal Branch Pipe	1
17	Revolving Branch (Revolving Head)	1
18	Short Branch Pipe Light Alloy (fitted with Nozzle of 12 mm, 16 mm, 20 mm & 25 mm) ISI Marked	4
19	a) Adapter for 140 mm suction female screw coupling and 63 mm male instantaneous (GM) b) Adaptor double female instantaneous 63 mm (GM) c) Adaptor double male instantaneous 63 mm (GM)	2 2 2
20	Nozzle Spanners (GM)	2
21	Safety Lanyard Nylon with Carabineer & Hook 10 Mtr each	6
22	Hand held LED light with Rechargeable Battery	2
23	Flameproof Lamp (useful in presence of Inflammable Vapours of Gases)	2
24	First Aid Box for 10 Persons	1

25	Large Axe with thick bamboo handle	1
26	Spade with thick bamboo handle	1
27	Pick Axe with thick bamboo handle	1
28	Crow Bar	1
29	Sledge Hammer - 6.5 kg	1
30	Carpenter's Saw - 60 cm	1
31	Hydraulic Jack - 15 ton	1
32	Fire Hook	1
33	Tool Kit	1
34	PA system inbuilt in cabin - 01 No	1
35	Bolt cutter	01
36	Multipurpose Hand Held Nozzle shall be made of Light Alloy Extruded Construction As Per ISO 64430WP Grade. It shall have twist type control for straight jet, spray and wide angle fog, operating efficiently at low pressure of 3.5 bar. It shall have facility to operate Solid Jet & Fog simultaneously or independently and discharge more than 500 lpm for jet and 300 LPM for spray (combined discharge capacity – 800 LPM) @ 5 bar pressure. The horizontal Jet Throw in still air shall be around 35m at 5-6 bar pressure. It shall have provision for change over to flush mode without shutting-off the flow. It shall have superior design of rubber grip, twist shut off from fog to stream and provision of teeth to provide dense fog. It shall have a Control Lever for ON-OFF Position and a 63 mm size inlet connection. A pistol grip handle for better grip shall be provided. The nozzle shall be hard anodized to prevent corrosion and wear. The weight of the nozzle shall not be more than 3 kg. The nozzle shall be CE certified to EN15182	3
37	Multi Flow Hand Held Nozzle shall be made of Light Alloy Extruded Construction As Per ISO 64430WP Grade. The nozzle shall be hard anodized to prevent corrosion & wear. It shall have a twist type control for Straight Jet, Spray And Wide-Angle Fog. It shall have arrangement for selection of five flow ranges from 350 to 900 LPM by twist of a dial on the nozzle. The horizontal Jet Throw in still air shall be around 35m at 7 bar pressure. It shall have Pistol Grip handle to provide for superior grip control to the operator. It shall have provision for change over to flush mode without shutting-off the flow. It shall have a replaceable spinning teeth ring for generating a dense fog curtain, a ball valve type handle for shutting off the flow and a 63 mm Inlet connection as per IS: 903. The nozzle shall be CE certified to EN15182.	3
38	Reputed Manufacturer like Dräger/ Scott/ MSA make light weight Self Contained Breathing Apparatus Set with carbon composite air cylinder with one spare carbon composite air cylinder of 45 min duration of 6.8 litres 300 bar pressure shall be CE marked to EN 137 & face mask to EN 136 CL 3/III. Air Cylinder & it's valve shall be approved from CCE-Nagpur.	4
39	Fire Proximity Suit made of DUPONT NOMEX fabric with coat, pant, gloves, hood, fireman helmet and boots. (CE marked)	2
40	PYROJET Fire Hose with Inbuilt Jet Curtain Nozzles flow 900 lpm – 63 mm x 15 m	4
41	Petrol Driven Positive Pressure Ventilator (Blower) - 16" Size - Engine of 5.5 HP, 16" Fan Size, 17 blades, 17,000 m^3/hr, Weight : 30 kg (approx) to be supplied with ducting	1
42	Fire Retardant Dangry free size from reputed manufacturer	10
43	Fire men Helmet as per BIS from reputed manufacturer	10
44	Firemen Gumboots - Pairs(size-9&10No.), 05 pairs each.	10
45	Rubber, canvas, Leather & asbestos Hand Gloves-06Pairs each.	24
46	Folding stretcher	02
47	Fire Blanket from reputed manufacturer	04
48	Life Buoy	06
49	Life Jacket	06
50	Climbing Rope(30m) Nylon	01
51	Rescue Kit set	03
52	Chemical suit, high quality (Free size)	10
53	Honey bee suit, high quality (Free size)	04
54	Reflector jacket	10
55	Door breaker	02

56	Mega phone	02
57	Full body harness Combination with Sock observer safety lanyard	06
58	Rescue rope 60mtr. Nylon	02
59	Carabineer "D" Shape (SS)	10
60	**Tripod and winch system for sever/ Deep Rescue purpose**	02
61	Fire Entry Suit Free Size from reputed manufacturer	02
62	Foam making branch pipe 5X &10Xwith pick up & connecting tube – 02 Nos each.	04
63	Caution Tape in roll	02
64	Barricading Cones	06
65	Chain Saw with 04 sets of spare chain	01
66	Rotary Hammer 04 sets of spare bites for drilling & Chiselling	01
67	Chipping Hammer 04 sets of spare bites both chisel & Conical type	01
68	Rotary Rescue Saw 04 sets of spare blades	02
69	Reciprocating Saw 04 sets of spare blades for wood & Metal each	02
70	Mannequin (Half body CPR)	02
71	Spinal Board (Back Board)	01
72	Cervical Collar	06
73	Hacksaw Frame with 10 Spare blades	01

17.DOCUMENTS REQUIRED AFTER COMPLETION OF ORDER

The following documents shall be submitted in 2 sets:-

(i) As built drawing of tender,
(ii) As built drawings for tanks,
(iii) Flow diagrams,
(iv) GA and cross sectional drawing, characteristics curves &other details of pumps,
(v) As built drawings for installation of PTO unit,
(vi) As built drawing for electrical circuits,
(vii) All inspection and testing records for tank, pump, PTO, piping, vales, monitor etc.,
(viii) Three sets of operating and instruction manual for the tender.

18. PERFORMANCE GUARNTEE

The manufacture shall guarantee the design, material, workmanship and performance of complete unit for a period of 18 months from the date of supply of completed vehicle. Any mechanical defects, faulty workmanship or operational defects found during this period shall be rectified by the vendor at owner's premises within reasonable time without any extra cost of DEPARTMENT. The tank shall be warranted against leakage for a period of 5 years after supply in writing.

19. TRAINING

After supply of vehicle, vendor shall provide free training on operation & maintenance including chassis at DEPARTMENT/ owner's site at the time of supply of vehicle for two days.

21. WORKMANSHIP & FINISH

The GVW (Gross Vehicle Weight) of appliance shall not exceed the rated GVW of the chassis manufacturer with all equipments & crew. The weight distribution diagram shall be submitted along with the offer failing which the offer is liable for rejection.

22. PAINTING & MARKING

The entire structure shall be prepared by grinding the welded surfaces, priming the finished material with a zinc rich primer & then finally coated with a two pack epoxy based paint.

22.1. Surface Preparation

Once the paneling is completed, all the outside surfaces shall be painted with a good quality paint system, like Du-Pont, PPG, Standox, etc. This shall be poly-urethane (PU) based paint with a life of minimum 10 years. The bidder shall guarantee fade resistance of minimum 5 years from supply even if the vehicles are kept in the open.

22.2. Vehicle Exterior Paint

The complete vehicle (all exterior surfaces) and monitor shall be painted with at least 2 coats of zinc phosphate primer each of 50 microns DFT (Dry film thickness) and two coats of polyurethane finish paint each coat of 50 microns DFT. Further improvement on the paint may be carried out by the manufacturer beyond that mentioned above, to give better protection & surface finish. The color for the outside shall be as per the latest international & Indian norms for fire brigade vehicles. The user name shall be written on both-sides with yellow color.

22.3. Water Line Paint

Water lines shall be painted with of zinc phosphate epoxy primer each of 50 microns DFT and two coats of PU finished paint each coat of 50 microns DFT. Water lines shall be painted red in color.

22.4 Details Required

The bidder shall give the details of entire painting process & also details of in house painting facilities like paint booth, etc. The color for the outside shall be as per the latest International & Indian norms for fire brigade vehicles. The user name shall be written on both-sides with yellow color.

22.5. Reflective stripes

Reflective stripe(s) shall be affixed to the perimeter of the apparatus. The stripe or combination of stripes shall be a minimum of 4 in. (100 mm) in total width and shall conform to the minimum requirements of ASTM D 4956, Standard Specification for Retro reflective Sheeting for Traffic Control, Type I, Class 1 or Class 3. At least 50 percent of the cab and body length on each side, at least 50 percent of the width of the rear, and at least 25 percent of the width of the front of the apparatus shall have the reflective material affixed to it.

22.6. Marking / Name Plates & Owner's Emblem

All the lockers/ cabins shall be provided with Stainless steel Name Plates with letters itched on it boldly indicating the content. Owner's emblem in original colour together with name (in Hindi and English) as below shall be written in golden yellow colour on both sides of the vehicle.

22.7. Other Miscellaneous Works

The inside of lockers shall be painted in pale cream/ grey colour. The chassis frame shall be painted black and wheel arch shall be painted grey/white. Under frame of Chassis shall be painted with chlorinated rubber paint. The appliance shall clearly have the following marks at suitable locations.

1. Manufacturer's name & trade mark.
2. Year of manufacture
3. Pump serial numbers and capacities.
4. Capacity of water tank and foam compound tank in liters.
5. Engine and chassis number.
6. All instrument control & valves shall be identified with properly itched metallic Name plates.

23. ACCEPTANCE TESTS

The acceptance tests as mentioned below shall be given to complete satisfaction of inspecting officers. Vendor shall ensure that design of tender shall not affect chassis parameters such as speed, turning circle, acceleration etc. All inspections & tests shall be carried out by the vendor to the complete satisfaction of DEPARTMENT's representative, who shall have access at all reasonable times to vendor's works. All testing parameters shall be carried out at manufacturer's premises & details (photographic evidence) of infrastructure shall be provided with bid failing which the offer shall be rejected. These tests shall be offered at the manufacturer's workshop prior to shipment. The testing charges for the same shall be borne by the vendor. The vehicle shall also fulfill the requirement of RTO as per BIS 10460.

23.1 Pump test

The pump fitted on the vehicle shall be subjected to various tests as detailed below-

(i) The pump with its all fitments will be subjected to Hydrostatic testing on a pressure of 25 kg/cm^2.

(ii) The pump shall be run dry for a period of minimum two minutes at 2000 rpm to check the integrity of mechanical carbon seal. After this test there shall not be any leakage of water through carbon seal.

(iii) The pump performance test shall be carried out by running the pump at constant RATED RPM and measuring the discharge at various pressures.

(iv) The pump shall be subjected to endurance test for a period of four hours continuous running and pump shall deliver rated output of 4000 lpm at 10 kg/cm^2.

(v) During the endurance test the water shall not be replenished in the cooling system and the temperature of the cooling water and engine oil should not exceed the manufacturers standards recommendations for the continuous operation and engine should not show any sign of stresses.

(vi) During the test, water shall not be replenished for the cooling system as the temperature of the engine oil shall not exceed 150^{0}C or the engine manufacturer rated temperature for continuous working whichever is less. The engine shall show no sign of stress during the period of testing.

23.2 Stability & Gradient

Stability of appliance shall be such that when fully equipped & laden, if the surface on which the appliance stands is titled to either side at an angle of 27^0 from horizontal it shall not overturn. The vehicle shall be tested on a gradient test ramp at an angle of 1:4 as per BIS.

23.3 Endurance Test

The pump shall be tested (23.1 above) for a continuous period of four hours non-stop & the water shall not be replenished during this test & the engine shall not show signs of overheating. This test shall be offered at the pump manufacturer's workshop prior to shipment. The testing charges for the same shall be borne by the vendor.

23.4 Priming Test

The priming shall be tested as per the latest standards & the system shall be subjected to a test at a suction of 7 m. The priming shall be achieved in less than 23-24 seconds.

23.4 Articulation Test

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

23.5. Hydraulic Testing

All the piping shall be subjected to hydraulic test pressure of 15 kg/cm^2 for a period of minimum 10 minutes. The pump casing shall be subjected to a hydraulic test pressure of a minimum 25 kg/cm^2.

23.6. Shower Test

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

23.7. Road Test

After completion of all the above mentioned tests, a road test shall be carried out where the vehicle shall be tested as per the parameters laid down by the BIS. The braking, acceleration & top speed tests shall be checked & recorded by the inspecting officers.

24. INSPECTION

3 Stage Inspections / test of the above Foam Fire Tender shall be carried out at fabricator's site by CISF Fire Wing representative & management official as per details given bellow:-

1st Stage: Inspection of Manufacturer facilities, Inspection of chassis, Inspection of material for fabrication, inspection of under structure, Water & Foam tanks.

2nd Stage: Placement of the water & foam tanks, fitting lockers, pump & PTO.

3rd Stage: In Final acceptance test/ Inspection (PDI) shall be carried out in accordance with above standards.

(i) First Stage

a) Review of mill test certificates and co-relation of raw materials used for structure & body fabrication before start of fabrication.

b) Review of approved drawing used for structure & body fabrication before start of fabrication.

c) Inspection of frame work/ under structure (for cabin and body) for soundness of welding and fitment of chassis, Water & Foam tanks and dimensional check.

(ii) Second Stage

Inspection of structure, mounting of sub-frame with meta-cones and proper foundation, Fitment of PTO, Hydraulic testing of water & foam tank before mounting and their dimensional check. Inside/outside panelling of sheets. Hydraulic testing of pump before mounting (Pump shall be hydraulically tested at 25

kg/cm^2 for 30 minutes and during test; no crack or leakage shall be developed). Hydraulic testing of pipeline and their dimensional check (Pipeline shall be hydraulically tested at 15 kg/cm^2 for 10 minutes and during test no crack or leakage shall be developed). Inspection of proper installation of pump, tanks, piping with supports and their dimensional check. Inspection of fabrication work, cooling by pass valve and pipeline leading to heat exchanger, and suitable connection for its outlet, while checking all relevant parameters. All tests shall be carried out as specified in the specifications or as per relevant IS whichever is on higher side.

(iii) Third/ Final Stage

Testing of accessories/ equipment mentioned in Annexure-A, Inspection of proper installation of pump, tanks, piping with supports and their dimensional check, four hours acceptance test of pump of rated output at normal and high pressure, maximum rotation of the monitor, angle of elevation and depression. Testing of all other normal items of equipment, fitments, accessories, light, fog lamps, search lights, revolving, blinker, spot light, rear warning light, as per specified standard. Testing of duty points of the pump, including deep lift test, road test, braking test, articulation test, gradient test, etc., when the vehicle is fully loaded. Output and throw of monitor, throw of side line with water and prepared foam separately, testing of priming device while working from open source of water supply.

24/3/21

सहा कमाण्डेंट / अग्नि
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ANNEXURE-B

SPECIFICATIONS FOR MULTIPURPOSE FIRE TENDER
MULTIPURPOSE FIRE TENDER WITH AERODYNAMIC DESIGN

1. **GENERAL REQUIREMENTS:** The agency will fabricate the Multipurpose Fire tender of Aerodynamic Design (as per Technical Specifications enclosed) after procurement the BS6 compliant Cowl chassis make of TATA Motors/ Ashok Leyland / Eicher or equivalent (Similar) Chassis, shall be minimum 16 tonne GVW and if not available in 16 tonne GVW the same shall be selected in next higher GVW, but the chassis offered should be able to meet the all technical parameters requirements as per our NIT and the appliance shall incorporate rear mounted pump of 3000 LPM capacity, a water tank of 5000 litres capacity, a 500 litres capacity foam tank, 2X75 Kg- DCP tank, water cum foam monitor mounted on the drivers cabin, a CO2 system of 22.5X4 Kgs capacity with hose reel, one 10.5 meters aluminium alloy extension trusted ladder. However the detailed specs of the appliance shall be as per the detailed specs in following chapters.

2. SCOPE

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

- Chassis
- A centrifugal type fire water pump
- Power take- off units for driving water pumps.
- Foam compound tank
- DCP system & CO2 system
- Water tank
- Round the pump foam proportioning system
- 3200 LPM capacity foam-cum- water monitor.
- Hose reel (35mm synthetic hose with nozzle length – 50 Meter)- Normal Pressure
- Hose reel high pressure hose reel of 30 mm (30 meter length)
- Body fabrication
- Accessories and spares
- Piping, necessary control, fire hoses etc. complete.
- Cooling system of indirect type with open circuit.

2.2. The cost of BS6 Compliant Cowl chassis to be included in offer.
The vendor shall be responsible for supplying all equipment / accessories and properly fixing them on the chassis as described in the specification. Other details and requirements which are not covered Under the specification, but may be necessary to complete the multipurpose fire tender and / or fulfill the operation / performance requirement shall be provided by the vendor who will be responsible for the design and construction of the complete appliance to the full satisfaction of the owner.

2.3 GENERAL.

The Multipurpose fire tender including all accessories shall be designed, manufactured and tested as per relevant Indian, International Standard wherever applicable. 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 rapidly accessible for use and maintenance. The centre of the gravity of vehicle shall be kept as low as possible.

3.0 CHASSIS

3.1 The Multipurpose Fire tender shall be fabricated on BS6 Compliant Cowl chassis of TATA Motors/ Ashok Leyland / Eicher or equivalent (Similar) Chassis (Minimum 16 tonne GVW and if not available in 16 tonne GVW the same shall be selected in next higher GVW).

3.2 The Chassis shall be capable to take gross vehicle weight minimum of 16 Tonne.

3.3 Engine shall be capable of developing power 130 BHP at 1900 RPM.

3.4 The chassis shall be supplied with standard tools kit and spare wheel assembly.

3.5 Chassis shall be complete with standard feature and accessories provided by the manufacturer including the standard tool kit supplied by the vendor.

3.6 The vendor shall confirm that the proposed TATA / Ashok Leyland/ Eicher or equivalent (Similar) Chassis (Mnimum 16 tonne GVW and if not available in 16 tonne GVW the same shall be selected in next higher GVW) is capable of taking the pay load indicated by the vendor and shall be able to meet other duty requirements.

Any restrictions on performance of chassis, observed during execution of order due to increase by vendor in pay load and other duty parameters shall have to be corrected by vendor in consultation with Management and chassis supplier. Such correction shall be at no extra cost to NTPC.

4.0 PUMPS

4.1 WATER PUMP

The Water centrifugal pump with automatic priming device shall be of any standard company. The pump shall be of normal and high-pressure type capable of delivering 3000LPM@ 7Kgf/cm2 and 300 LPM at 35-40 Kgf/Cm2.

4.2. The pump shall be capable of delivering minimum 3000LPM at 7 Kgf/Cm^2 at delivery outlet. Vendor shall match other parameter of operation with reference to Engine of chassis.

4.3 The pump shall be capable of taking suction from:

- Water tank mounted on chassis (In normal condition)
- Open water source through flexible suction hose up to suction lift of 7.5 m, with the help of automatic water ring primer.

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

4.5 Pump Casing shall be made of gun-metal, Impeller shall be closed type and shall be made of bronze. The impeller and casing wear rings shall be renewable type, The pump shaft shall be made of stainless steel and shall be fitted with antifriction bearings. The pump shall have self-adjusting type mechanical seal, which shall be capable of running dry for minimum one minute.

4.6 The pump suction inlet shall be so sized and oriented to facilitate suction as per clause 4.3 .

4.7 The pump discharge shall be routed to:

- 4nos. outlets (on rear side of vehicle along with control panel) each fitted with Stainless Steel reputed brand make IS/BS marked ball valves and ending in ISI marked 63MM, Stainless Steel female coupling fitted with stainless steel end caps.
- Foam-cum-water monitor fitted on top of vehicle.
- Hose reel of high and normal pressure.

4.8 The strainer should he easily removable for maintenance.

4.9 The pump shall have a suitable box type suction strainer made of Stainless Steel.

5.0 PRIMER:

5.1 The pump shall be fitted with independent priming system made of Gun Metal.

5.2 The automatic water ring primer shall be capable of lifting water up to at least 7 Mtr. Depth (Suction Lift) at a rate of not less than 30 cm3 per second in the suction line.

5.3 The auto primer shall work satisfactorily even if it is left dry for a long period.

6.0 POWER TAKE OFF UNITS

6.1 The power takes off unit for water pump shall be of reputed Make like VAS/SYALL/WEBER or equivalent, The PTO Shall be able to meet performance requirement of pump. The lever for engaging & disengaging PTO shall be provided in drivers cabin.

6.1.1: The Vendor shall submit a sketch showing the arrangement of PTO Unit for taking power from main engine chassis to water pump.

6.2 The drive assembly components (shaft, couplings etc.) shall be dynamically balanced and vibration of any parts should be minimum.

6.3 Necessary support for PTO Unit, Propeller Shaft, Couplings, and Universal Joints etc. shall be provided.

7.0 WATER TANK:

7.1 **Capacity:** 5000 Ltrs. With additional 2% expansion space.
MOC:- All in SS-304

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

7.3 The water tank shall be fabricated out of minimum **5 mm thick SS plates.**

7.4 The water tank shall be of welded construction and shall be suitably stiffened with angles / flats so as to avoid buckling and distortion.

7.5 The tank shall have baffles of minimum 3 mm thickness suitably supported, so as to avoid water surging due to movement of vehicle.

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

7.7 Two Nos. of inspection manholes of 500 mm size shall be provided on top with a Hinged and bolt able cover with suitable gasket.

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

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

7.9.1 The tank shall have a cleaning manhole hole of 250 mm dia. Manhole shall be fitted with 50mm drainpipe with ISI marked Gate Valve.

7.9.2 Tank should be mounted on chassis in a manner, keeping in view the proper load distribution on the Axles. Tank should be rectangular in shape.

7.9.3 The tank shall be so mounted and bolted as to bring the center of gravity of the appliance as low as possible.

7.9.4 A digital visual water level indicator shall be provided in the driver's cabin.

7.9.5 The tank shall be fitted with overflow pipes of suitable diameter and the discharge end shall be taken from below the chassis without reducing the effective ground clearance of the vehicle.

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

7.9.7 The tank shall be filled by means of suitably sized inlet line from pressurized hydrant mains. 4 nos.,63 mm, SS instantaneous male connectors (02 on rear side and one on each side of foam/water tender) shall be connected to the filling line. The inlet lines will be provided with suitable NRV's .

7.10 The tank shall be fitted with one filling orifice. The filling orifice shall be on not less than 250 mm diameter and shall be fitted with an inspection manhole on the top of water tank.

7.11 A 150 mm dia pipeline shall be taken from the tank to the suction inlet of the pump incorporating an Audco make SS ball valve. Separate valve(s) for performing different function shall be provided to control the flow of water.

or equivalent

7.12 All nozzles of tank shall have suitable reinforcement pads. The tank shall have adequately sized breather.

7.13 A.150mm dia pipeline will be taken from tank to suction inlet of pump incorporating and Audco make SS Ball valve. or equ.

Separate valve (S) for performing different functions shall be provided to control the flow of water. Any of the following operations at the time of emergency should be possible.

- TPR(Tank to pump to reels)
- HPR (hydrant to pump to reels)
- HR (Hydrant to reels)
- TPM (Tank to pump to monitor)
- PT(Pump to tank)
- Off a separate Ball valve of SS for performing the functions shall be provided.

8.0 FOAM TANK

8.1 A foam compound tank of 500 liters net capacity shall be fabricated out of **SS-304 plates of minimum 5 mm** thickness & at top 2% of expansion space shall be provided in the tank over and above foam compound capacity.

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

8.3 The tank shall have baffles of 3mm thickness, SS-304 plates, so as to avoid water surging due to movement of vehicle.

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

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

8.6 The tank shall also have a cleaning manhole of 250 mm dia and 50mm drain pipe fitted with ISI marked gate valve.

8.7 The tank shall be provided with 500MM-dia inspection manhole with hinged and boltable cover with suitable gasket.

8.8 Breather Valve shall be provided for automatic venting of foam compound tank.

8.9 Foam level indicator of graduated glass tube shall be provided close to the Control panel. Isolation valve should be provided just after the tap off point.

8.10 A suitable transfer pump rotary type with necessary piping and connections shall be provided for transferring Foam Compound from drums to the foam tanks.

9.0 FOAM PROPORTIONING SYSTEM:

A round the pump foam proportioning system shall be provided with three settings of metering device as 1%, 3% & 6%.

9.1 Auxiliary foam pick-up tube arrangement from outside should be provided.

10 DCP SYSTEM:

10.1 One number each (Capacity: 75Kgs) of dry powder fire extinguisher shall be fixed on both side of fire tender with a separate hose of 10 m. High pressure hose with pistol grip nozzle. The dry powder vessel shall be fitted with 02 nos of Nitrogen cylinder to ensure that 90% powder is discharged. 02 nos. of N2 cylinders will be supplied along with appliances as spare. The dry powder containers shall be lead tin alloy coated by electrolyte process for anti-corrosion. Cylinder shall be CCE Approved and filled with mono-ammonium phosphate base DCP.

10.2 A test Certificate for all the nitrogen cylinders issued by Chief Controller of Explosives, Nagpur should be submitted by the fabricator at the time of delivery/ 3rd stage inspection.

10.3 Hydraulic test certificate of vessel is also to be submitted by the fabricator at the time of delivery/ 2nd stage inspection.

11. AUXILIARY CO2 SYSTEM

11.1 CO2 HOSE REEL SYSTEM : A standard CO_2 equipment 4 x 22.5 Kgs. CO_2 cylinders(Preferably) two on either side of the vehicle) having not less than 22.5 meters long hose-reel and 16 mm bore conforming to IS-5132 with a electrically non conducting discharge horn suitable for CO_2 flooding from a control valve shall be required to be provided. The CO_2 system is required to be installed in the cabin mounted with string lockers with strong base of chassis.

11.2 Swiveling guide rollers shall be fitted wherever necessary to prevent tubing from kinking.

11.3 The CO2 charged cylinders shall confirm to IS-2878-1967, ISI Marked and tested at 250 Kg/cm2 and shall have the approvals/certification of CCE, Nagpur.

11.4 The CO2 extinguisher shall be ISI Marked and CCE approved and shall be filled with liquefied CO2 gas to the filling ratio of not more than 0.667.

12. Monitor (Water / Foam)

Monitor suitable for WATER –FOAM

One, Water cum foam monitor shall be provided on the top at suitable location, with cap. of 3200 lpm of water @ 7 Kg/cm2. The monitor shall be capable of traversing through 360° in horizontal plane, +75° & -15° in vertical plane with discharge range of 60 M (water). The detailed specification of the Monitor is as under:

MONITOR :-

»	Size	100 mm
»	Body	Barrel of seamless heavy pipe, Gunmetal swivel joint (Gear type) for horizontal & vertical motion manual operation.
»	Rotation	360°

» Elevation 90° (+75° -15°)

SELF INDUCTION NOZZLE :-

» Material of construction	Al. alloy to IS:617
» Type of Foam used	AFFF/ATC Foam
» Discharge capacity	1000 GPM
» Throw of 7 Kg/cm2 horizontal	Water: min. 70 mtrs. , Foam: min. 65 mtrs.

13.0 BODY WORK

13.1 Pressed section of sufficient strength shall be used for super structure.

13.2 Extension ladder (35 ft.) shall be mounted on suitable gallows fitted with toilers and designed to facilitate easy and quick removal of the ladder by one man from the rear of the tender.

13.3 No part of the bodywork shall reduce ground clearance of vehicle to less than 36 cm. The highest part of the appliance with the ladder and monitor mounted on it shall not exceed 3.60 Mtr. from the ground level. The width of the vehicle in ready condition shall not exceed 2.5 meters. The construction of super structure shall not reduce the angles of approach below 30 degree.

13.4 A reflective stripes (s) shall be affixed to the perimeter of the apparatus. The stripe or Combination of stripes shall be minimum of 4 inch (100 mm) in total width.

13.5 Provision shall be made to store two no. BA sets in the back rest of the driver, officer and the crew seats with suitable clamps and brackets where the BA sets (single cylinder) shall rest and shall not be kept in a hanging condition.

LADDER GALLOWS:

Gallows shall be provided to carry 10.5 mtr aluminum alloy trusted ladder conforming to BIS. The design shall be such that the ladder can be released without difficulty from a reasonably accessible position & shall embody rollers to allow easy withdrawal by one man

COOLING SYSTEM:

Indirect cooling system of open circuit type consisting of special heat exchangers shall be provided to enable full power output during pump operation without any heating of engine and PTO. Suitable gauges both for cooling water & lubricating system appropriately marked with normal operating temperatures shall be suitably provided & located on instrument panel in driving compartment & duplicated on pump operating control panel.

14. LOCKERS:

12.1 Size and number of lockers shall be designed such that on either side 12 Nos. 22.5 m length hose can be easily accommodated in single layer and equipments may be accommodated in maximum two layers. Sufficient numbers of lockers shall be provided to accommodate all the equipments/accessories in an easily accessible manner.

12.2 All lockers shall be provided with Roller type shutter doors.

12.3 Roller shutters shall be of hollow rectangular shaped & made from Aluminum interchangeable links connected by means of plastic profiles.

12.4 Roller shutter shall be inward rolling type and shall be provided with guide rails over entire length on both sides to make them torsion free.

12.5 Roller shutters shall have locking arrangements to prevent accidental opening during movement of vehicle.

12.6 All the lockers shall be fitted with internal lighting, which shall be capable of being automatically switched "ON" and "OFF" by the opening of shutters.

12.7 Lockers shall have arrangements for self-draining of any water entering inside.

12.8 Sufficient Nos. of lockers shall be provided for storage of all accessories listed in Annexure-I and for other equipments which are necessary for Foam Tender but not given in Annexure-I. Lockers shall also be provided to accommodate 6 Nos. DCP Extinguishers of 10 Kg capacity. All the lockers shall be provided with 4 mm thick, vulcanized synthetic rubber mat at bottom and up to 12 inches on three sides.

12.9 Proper place for storage of (2x2) nos. of suction hoses on both sides of tanks-under roof.

15. **AUXILIARY FOAM INDUCTION DEVICE:**

Auxiliary foam induction system operated through hydrant water pressure is required for directly picking up foam from foam tank. Induction device should induct 3% foam at the inlet water pressure of 7.0 Kg./Cm^2.

16. **PIPING:**

16.1 **Foam Piping:**

a) Total piping in foam circuit shall be of SS-304.

b) All ball valves in foam circuit shall be of AUDCO make SS-304 with Teflon seats. or equivalent

16.2 **Water Piping:** Water piping shall be of SS Pipes, fittings and valves in the water circuit which will come in contact with foam solution (foam-water mixture) shall be of SS. All piping shall be designed to have minimum pressure drop and achieve the required pressure and flow at various locations. All piping shall be hydraulically tested at 1.5 times the design pressure however in no case will the lines be hydraulically tested at less than 18 kg./cm2 pressure and shall be able to hold the pressure for minimum 2 hours

17. **HOSE REEL:**

17.1 One normal hose reel shall be provided and mounted on the vehicle. Hose reel shall have not less than 50 mtrs. Length and 19 mm bore tubing/hose.

17.2 The working pressure of tubing/hose shall not be less than 18 kg/cm^2.

17.3 One jet/spray nozzle of 20 mm size (outlet) with shut off valve shall be provided with the hose reel.

High Pressure Hose Reel : One high pressure Hose Reel (30 mm) to facilitate operation of high pressure section of Fire pump shall be provided and mounted so as to be accessible for use from either side of the appliance. Swiveling guide lever shall be fitted to prevent the tube from kinking / winking. The high pressure hose reel shall not be less than 50 M in one length and 19 mm bore terminating in a high pressure fog gun. The working pressure of the tube shall be 40 Kg/ cm^2.

18. **CONTROL PANEL**

An adequately illuminated pump-operating panel shall be provided at the rear side of the appliance with following features: -

1. Auxiliary throttle control for the engine.
2. Independent pressure gauge calibrated to 15 Kg/Cm2 for pump discharge.
3. Threaded suction inlet of water pump with blank cap.
4. Control for using the auxiliary foam compound pick up tube.
5. Visual indication show gauge for engagement of PTO unit
6. Engine Temperature gauge.
7. RPM indicator for pump.
8. Engine Oil Pressure Gauge.
9. Quick opening main valve.
10. Level Gauge for Foam &Water Tanks.
11. Priming Valve for Water Pump.
12. System Schematic etched on S.S. Plate.
13. Operating instruction plate.
14. Compound Pressure gauge calibrated as per IS-951 for water suction.
15. Foam On/off Valve.
16. Valve for hose reels.
17. Operating instruction plate and flushing out instruction plate (Both itched on brass plates).

In addition to the above, any other items that he may find essential for efficient operation shall be provided by the vendor at suitable locations. Each lever, switch, valve, gauge, outlet/inlet etc. shall have identifications made on metal plate and duly riveted.

19. ELECTRICAL SYSTEM:

All important electrical circuits shall have separate fuses suitably indicated & shall be grouped into a common fuse box located in an accessible position in Driver's cab and fitted with means for carrying spare fuses. All the wiring shall be dipole & properly fixed in position and not be exposed to the atmosphere for protection against heat, oil & physical injury. Conduits shall be used wherever necessary. You shall submit wiring diagram along with the offer.

All equipment's lockers shall have individual lights and these shall be operated by means of a master switch (two way) on the dash board in the driver's cabin (as well as from the local i.e. from lockers)

The switch of the siren shall be provided on the left corner of the dash board (Near front left side.)

Two fog lamps shall be suitably attached to the front bumper of the appliance.

Reverse lights with on-off buzzer, on either side shall be fixed suitably at the rear of the appliance with wire mesh in such a manner to prevent accidental damage by the firemen while mounting the tank top.

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

20. PAINTING & MARKING:

20.1 Vehicle and monitor should be painted with 2 (Two) coatings of zinc phosphate epoxy primer and two coats of polyurethane finished red paint.

20.2 All the lockers/cabins shall be provided with stainless steel nameplates with letter itched on it boldly indicating the content.

20.3 Water line should be painted red and foam line in yellow colour paint.

20.4 Entire appliance shall be painted in 3M / Dupont make, fire red colour (shade no. 536 of BIS 5-1978) and paint conforming to BIS 2932-1974 and thickness of 0.12 to 0.2 mm using double coat spray painting on outside.

20.5 The driving compartment and the inside lockers shall be painted in pale cream.

Name of under taking	**Name of Undertaking** (Govt. of India Undertaking) CENTRAL INDUSTRIAL SECURITY FORCE (FIRE WING)

Name of under taking	Name of under taking केन्द्रीय औद्योगिक सुरक्षा बल (अग्निशमन शाखा)

Shall be written in English in golden yellow colour in English on one side & in Hindi on the other side of the vehicle. On the front of the vehicle **FIRE TENDER** shall be written in English.

20.6 The inside of the lockers shall be fabricated with 2.3 mm thick aluminum chequered plates.

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

20.8 Under frame of chassis shall be painted with chlorinated rubber paint.

20.9 The appliance shall have the following marks at suitable locations.

- Manufacturer's name & trade mark.
- Year of manufacture.
- Pump serial number and capacity.
- Capacities of foam and water tank.
- Engine and chassis number.
- All instrument control & valves shall be identified with properly itched metallic nameplates.

21. CABIN / STRUCTURE :

The entire structure of appliance including that of drivers cabin would be welded structure made of 14/16 SWG MS pressed section, square tubes, angles and channels with aluminium paneling. The complete MS structure shall be zinc plated and then painted with zinc rich primer and epoxy paint for better corrosion resistance.

21.1 Two front seats, one for officer and one for driver shall be provided in the cabin. One seat for 5 Crewmembers shall be provided behind the officer and driver seats. The seats shall be of good quality and latest design (bucket type seats with 100 mm thick cushions. Also good quality removable and washable seat covers shall be provided.

21.2 The cabin should have four doors (2 each side). The door shall open outwards. Cabin doors shall be provided with splinter proof safety glasses and shall also be provided with their movement mechanism.

21.3 First aid box made of fibreglass shall be provided and fitted in the cabin at suitable location for 10 persons & contents as per The Factories Act.

21.4 Non-slip type steps and rails shall be provided in the cabin to assist the crewmembers to get in and out.

21.5 Provision shall be made to store two no. BA sets in the back rest of the driver, officer and the crew seats with suitable clamps and brackets where the BA sets (single cylinder) shall rest and shall not be kept in a hanging condition

21.6 The crew cabin structure shall be so designed so as to avoid any vibration/rattling/deformation in the intended usage of vehicle.

21.7 Two numbers of large sun visors and rear view mirrors shall be provided on each sides.

21.8 The entire floor of the crew cabin shall be provided with 3M-make Vinyl matting of minimum 6mm thickness with anti-skid features.

21.9 Cabin shall have one roof light and two sidelights.

21.10 The paneling of vehicle should be done from 16 SWG aluminum chequered plate. The top of floor /deck shall be provided with 2.5 mm thick aluminum chequered

22. STRUCTURE/FRAMEWORK :

22.1 The structure/frame work on chassis and crew cabin shall be of welded construction and made from 32mm x 32mm x 1.6 mm hollow MS square section and distance between each horizontal and vertical square shall be maximum 400 mm.

22.2 The entire roof of the vehicle including the crew cabin top, entire rear, crew cabin floor, locker floor and sides shall be made from 2.5mm thick sheets of MS and sheets shall be bolted to the frame for ease in removal of the tank for repairs.

22.3 Dunlop MAKE anti-vibration rubber mouse shall be provided while mounting the tanks etc. of the chassis.

22.4 All light fixtures shall be adequately protected by providing grill covers or other suitable element.

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

22.6 Area around the monitor operation shall be provided with 16 SWG anodize & aluminium chequered plate (in addition to 2mm MS sheets) and shall be bolted to the frame.

22.7 The roof of the cabin should be rigid enough to take the weight of two persons without any deterioration.

22.8 Proper access ladder with Grab rails and non-skid steps shall be provided to give access to the roof.

22.9 Access hand rails constructed / covered by non-slippery material shall be provided wherever steps or ladders for climbing are located.

22.10 Storage of DCP and CO2 cylinders bottom plates and sport structure should be reinforced with extra angle iron frame.

23. GENERAL REQUIREMENTS:

The vehicle shall conform in all respect of the provisions contained in the M.V. Act 1988 and M.V. Rules 1989 or to any other statute modifications or re-enactment's thereon from time to time. All the equipment necessary for R.T.O.'s clearance shall be provided on vehicles.

ACCEPTANCE TESTS:

The following acceptance shall be given to the complete satisfaction of the user without any extra cost. The design of the tender shall be such that it shall not effect the chassis characteristic as specified by the chassis manufacturer such as speed, turning circle, acceleration etc as per IS: 10460-1983 (Reaffirmed 2010), IS: 950-2012 or relevant IS.

PUMP TEST :- In addition to the test to check the pump fulfills the requirements laid down in the pump specifications the pump shall run for four hours continuously and meet the duty points. Accordingly, during the test the water in the engine cooling system shall not exceed the maximum temperature of engine lubricating oil shall not exceed the maximum temperature recommended by the manufacture and the engine shall show no sign of distress.

HYDRAULIC TEST OF PUMP:-

Pump shall be hydraulically tested at 21 kg/cm2 for 5 minutes and during test no crack or leakage should be developed.

PRIMER TEST:

The primer test shall be carried out with a vertical lift of measured from the water level of the center of suction eye of the pump in order to check the fulfillment of the requirement laid down in primer specifications.

FOAM EQUIPMENT TEST :-

The foam hand lines inductor, selector valve and the foam monitor will be tested to satisfy the performance requirements as per our specification.

ROAD TESTS :-

i) Though the performance of the appliance in road test will mainly depend on the engine and chassis, the following performance in the road test will be desirable.

ii) A road speed of 72 km/h on level ground shall be readily obtainable with the appliance fully laden without trailer.

iii) The acceleration shall be such that with a warm running engine , the fully laden appliance shall attain a speed of 80 km/h from standing start through the gears in maximum time of 40 seconds on a smooth road in the case of diesel engine driven vehicles.

iv) The service (foot operated) breading system shall be such as to stop the fully laden appliance within 9m from the point at which the break is applied when traveling at 32 km/hr along a level dry road . The hand break system shall be capable of holding the fully laden appliance stationary on a dry surface gradient of 1 to 4 when in neutral gear.

STABILITY:-

The stability of the appliance will gain depend both on the chassis and fabrication of the body. The fabricator must take good care to actual distribution of the load and keep the center of gravity as low as possible. The suitability of the appliance shall be such that tender fully equipped and loaded condition including crew and if the surface on which the appliance stands is tilted to either side, the point at which overturning occurs is beyond the angle of 30 degree from the horizontal.

NOTE: - The fabricator of the appliance should provide suitable facilities for carrying out all the test specified above.

24. STAGE INSPECTIONS:

Two stage wise inspections / test of the above Foam Fire Tender to be carried out at fabricator's works by the inspecting officers (CISF & Management).

i. First Stage:-

Inspection of structure, mounting of subframe with metacones and proper foundation. Fitment of PTO, Hydraulic testing of water & foam tank before mounting. Inside/outside paneling of sheets. Hydraulic testing of pump before mounting, testing of pipeline, inspection of fabrication work, cooling by pass valve and pipeline leading to heat exchanger, and suitable connection for its outlet, preliminary test of pump, working of PTO, fitment of primer, while checking all relevant parameters.

ii. Second/Final Stage:-

Testing of accessories / equipments mentioned in Annexure - A, four hours (three hours for NP & 1 hour for HP section) acceptance test of pump of rated output at normal and high pressure, maximum rotation of the monitor, angle of elevation and depression. Testing of all other normal items of equipment, fitments, appurtenances, light, fog lamps, search lights, revolving, blinker, spot light, rear warning light, as per specified standard.
Testing of duty points of the pump, including deep lift test, road test, braking test, when the vehicle is fully loaded output and throw of monitor, throw of side line with water and prepared foam separately testing of priming device while working from open source of water supply.

INSTRUCTION BOOK, ACCESSORIES AND EQUIPMENT:

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

FINAL ACCEPTANCE TEST / INSPECTION:

Final acceptance test/ inspection shall be in accordance to IS 10460 where applicable and as per following performance tests:-

a) Road test.
b) Stability test.
c) Pump test.
d) Primer test.
e) Foam test performance and range.

25 INFORMATION/DOCUMENTS REQUIRED FROM VENDOR

After completion of Order, the following information / Documents shall be supplied by vendor:
i. As built drawing of tender.

ii. As built drawing of tank.
iii. Flow diagram of the appliance
iv As built drawing for installation of PTO Unit.
v. Drawing for Foam-cum-Water Monitor.
vi Line diagram for electrical circuits.
vii Drawing & data for Foam Induction Device;
viii. Cross Section drawings, characteristic curves and other details for water pump and foam proportioning system.
ix. All inspection & testing records for tanks, pumps, PTOs piping, valves monitor etc
x Three sets of operating and instruction manual.

26. **GENERAL CODITIONS FOR TECHNICAL QUOTATIONS**
* Parties to attach LP & HP pump data sheets, make and section of water pump along with their technical offer.
* Parties to submit a sketch showing the arrangement of PTO unit for taking Power from main engine on chassis to water pump.

27 **PERFORMANCE GUARANTEE** :
Manufacturer shall guarantee the design, material, workmanship and performance of complete Unit for a period of 18 months from the date of supply of the vehicle. Defects if any shall be rectified by the vendor's representative at our works at no extra cost to management.

28 **QUALIFICATION CRITERIA:**
The bidder should provide the following details along with quotation or otherwise the offer will be considered incomplete.
1. The bidder shall submit the layout of appliance front, rear, both side and top view indicating the lockers, pump panel, doors, windows, ladder gallows, water and foam tank, hose reel, extinguishers, fire bell, flasher and all lights.

2. The bidder shall submit the drawing indicating the fabrication details of water, foam tank, pipe line connection, pump, primer, PTO, cooling system around the foam proportionate, electrical wiring and spare parts.

3. Approved copy of pump working details from a recognized organization and pump manufacturing technology transfer particulars from the designer.

4. Technical literature pertaining to primer, PTO, Around the proportionate shall be submitted along with bid.

5. The bidder should have established fabrication facility with details shall be submitted.

6. Submit the reference list of customer (preferably Govt. Establishment where their similar appliance supplied.)

7. Joint two Stages inspection shall be carried by the representatives of Management and CISF at the Firm's Site on the mutually convenient dates.

29 a) **ACCESSORIES**. Each Foam Fire tender (Combined) shall be provided with following accessories over & above the accessories normally fitted on the chassis. All the accessories shall be suitably fixed in position or shall be kept in lockers or other suitable location as on the tender. Electrical fittings shall be flame proof & spare bulbs shall be supplied for each type & all equipment shall be IS marked.

S.N	Items	Qty. (In Nos.)
1.	Aluminium Extension ladder of 35 feet (Conforming to IS-4571)	01 nos.
2.	A-24 volts DC Operated "Grand" make blinker light bar (30" length) with P.A. System and Hooter with multiple tones should be provided on top of the vehicle with firm support and assembly shall be covered with S.S. grill. Assembly shall be operable from driver cabin.	01 nos.
3.	Manually operated Fire Bell (250 mm) fitted on roof of cabin.	01 No.
4.	Fog Lamps with covers	02 No.
5.	Reverse Lights at rear of chassis	02 No.
6.	Strong reversing siren connected with reverse gear of the vehicle.	01 Set
7.	Adjustable spot light with cover at the top of cabin roof	02 Nos.
8.	Removable spark arrestor on the exhaust pipe (Duly approved)	01 + 01 Nos.
9.	Hand controlled non-aspirating aqua fog/foam type nozzles having spray/jet pattern.(Pistol hand grip type) .	01 Nos.
10.	Jumbo Water Curtains (S.S.)	04 Nos.
11	Portable battery operated Public address system with charging system of suitable capacity.	01 Set
12	Compressed air Breathing Set: Light weight 1800 litres capacity self contained Breathing set (MOC of cylinder: Carbon composite fibre) with ultra light carrying case.	02 set + 2 nos. spare cylinders.
13.	PL Best quality cotton & Nylon jacketed delivery hose & 63 mm dia type II bearing ISI Mark on each length duly bind with ISI marked coupling 22.5 meter length bind with copper wire (IS 636-1979) .	10 Nos.
14.	Combined key for Hydrant, hydrant cover & lower valve	02 nos.
15.	First Aid box complete with contents as per The Factories Act (for 10 persons)	01 nos.
16..	Suction hose of braided (reinforced) rubber 140 mm internal dia in 2.5 mtr. Length (IS2410) fitted with 140 mm Suction .n hose coupling (IS902-1974)	04 nos.
17.	Suction Strainer 140 mm size with NRV / foot valve conforming as per IS 907	01 nos.
18.	Suction Wrenches (both conventional & universal) for 140 mm suction couplings as per IS-4643	01
19.	Foam branch -FMB-10X IS-2097- with pickup tube	02 nos.
20.	Foam branch -FMB-5X IS-2097-with pickup tube	02 nos.
21.	Brass OR equivalent ground level water monitor capacity 1900 LPM	01 no
22.	Flameproof High powered Emergency light with dimmer facility along with charger	01 nos.
23	Delivery hose 63 mm dia confirming to IS: 636 Type B in 30 mtrs length with Gun Metal male and female couplings. The hose and the couplings should be ISI marked.	12 nos.
NOTE : Any other accessory not included above , which makes the appliance more efficient & useful to be installed on the Foam Fire Tender		

29.0 b) SPARES ACCESSORIES TO BE SUPPLIED WITH EACH FIRE TENDER

S.No.	Items	Qty. (In Nos.)
1.	**SPARES** - Details of spares in appended below.	
2.	Hydraulic jack 20 ton capacity	01 nos.
3.	**All tools** required for normal routine maintenance of appliance which are **not included in the standard tool kit of chassis**.	01 set
4.	Basket strainer for armored suction hose of 140 mm dia (See IS 1531)	02 nos.
5.	Good quality foldable / collapsible Stretcher	02 Nos.
6.	Crow Bar (IS-704-1984), Large Axe (IS 4770), Pick axe (IS -273), Fire Hook (IS 927), Fire man axe IS 3650, Spade, Showel	02 each

7.	a) Hose bandages rubberized (See IS 5612(Part II) b) Hose clamps (See IS 5612(Part I) c) Hose slings	10 Nos. 10 Nos. 10 Nos.
8.	SS Make dividing breeching conforming to IS	02 nos.
9	Collecting breaching with control instantaneous pattern 63 mm as per IS 905.	02 nos.
10	Fog nozzle (See IS 952) with extension applicator with fog head	01nos.
11	Hand controlled diffuser branch for 63 mm size hose coupling	04 nos.
12	Branch pipe universal (IS 2871)	01nos.
13	Branch pipe revolving head (IS 906)	02 nos.
14	Branch pipe hand control (London Type)	02 nos.
15	Lowering line – rope Manila 51 mm , 40 m long having 2 ends spliced in & 01 end with a running Nose (IS 1084)	01 nos.
16	Long line — rope manila 51 mm circumference x 30 mtr long (IS 1084)	01nos.
17	Short line - rope manila 51 mm circumference x 15 mtr long (IS 1084)	01nos.
18	Low pressure diffuser branch(Low applicator branch)	02 nos.
19	Adopters as under : i. For 100mm suction female screw coupling & 63 mm male instantaneous ii. Double female instantaneous pattern iii. Double male instantaneous pattern	 02 nos. 02 nos. 02 nos.
20	Combi Tool (Spreader/ cutter)	01 nos.
21	Bolt cutter 24" & 36" – Taparia make	01 set
22	Hand Hack saw – Taparia make	01 nos.
23	Wooden Hack saw – Taparia make	01 nos.
24	Fire Beater	02 Nos.
25	Hand held Commando torch chargeable	02 Nos.
26	Karabinger D type	04 Nos.
27	Gaunlet Asbestos	04 nos.
28	Dragon Light	02 nos.

SPARE PARTS LIST FOR MAINTENANCE OF THE FIRE TENDER

HIGH-LOW PRESSURE FIRE PUMP
LIST OF SPARES FOR HIGH LOW PRESSURE FIRE PUMP FOR FIVE YEARS

Sr. No.	Description	Qty.
1	Oil Seal and 'O' Ring complete set	01 Set
2	Glydring	02 Nos.
3	'U' Seal	02 Nos.
4	Diaphragam for Cover Plate	02 Nos.
5	Discharge Seal	02 Nos.
6	Inlet Seal	02 Nos.
7	Piston Ring	02 Nos.
8	Mechanical Seal Assembly	01 Set
9	Bush for pump shaft	1 No.
10	Seal Washer Blank Cap	01 No.
11	Sealing Rubber for Flab	02 Nos.
12	Instantaneous Coupling Rubber	02 Nos.
13	Seal Washer Priming Valve	02 Nos.
14	Complete Bearing Set	1set
15	Cyl. Bronze assembly	2 sets

16 Wear rings front and rear 1set

POWER TAKE OFF
LIST OF SPARES FOR P.T.O. FOR FIVE YEARS

Sr. No.	Part Name with Part No.	Qty.
1.	Oil seal spacer	2 Nos.
2.	Oil seal spacer	2 Nos.
3.	Gasket CH	2 Nos.
4	Shifter Shaft	1 No.
5.	Bearing	1 No.
6.	Oil Seal	1 No.
7.	Fork	1 No.
8.	Bearing	1 No.
9.	O Ring	2 Nos.
10.	Cooling Coil	1 No.

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ANNEXURE-A

TECHNICAL SPECIFICATION FOR WATER 'TENDER TYPE- X IS: 6067-1983

1. **SCOPE**

The scope includes fabrication and supply of **Water tender with BS6 Cowl chassis** for fire brigade use fully built with all accessories mentioned in Appendix 'A', other fittings and accessories as per specification. The supply shall be with guarantee period of 18 months for material, accessories & workmanship for smooth functioning of the vehicle from the date of delivery to the department subject to acceptance by the user department. The detailed drawing of vehicle shall have to be submitted for approval (in 3 copies) within 30 days of placing of order. The vehicle shall be built conforming to IS: 6067-1983. The tendered shall enclose performance reports of the fire tender supplied by them from public sector undertakings.

2.0 GENERAL REQUIREMENTS

2.1 ***The appliance shall be designed to carry the equipment listed in Appendix "A". The equipment shall be arranged on a manner so as to allow the crew members to get ready in vehicle itself on the TATA Motors / Ashok Leyland / Eicher or equivalent (similar) BS6 Cowl Chassis, (Minimum 16 tonne GVW and if not available in 16 Tonne GVW the same shall be selected in next higher Tonnage GVW).***

2.2 No part of the body shall reduce the ground clearance less than 260 mm. Overall width shall not be more than 2500 mm and height shall not be more than 3300 mm from the ground level.

2.3 Due consideration in designing the appliance be given to the fact that the appliance may be required to operate on rough terrain also. The appliance shall also be capable of being started from rest up a gradient of 1 in 4 when laden.

2.4 All items, fittings and components given in Appendix 'A' shall be designed, fabricated, assembled and treated in accordance with the relevant standards published by BIS. In case where relevant BIS specification is not suitable, the equipment shall confirm to generally accepted codes and practice or relevant specification of the "Country of origin of the equipment".

2.5 The appliance shall carry 6,000 litres of water, a centrifugal pump capable of delivering not less than 3200 litres of water per minute at 0.7 MN/m2 and other accessories.

2.6 A hose reel shall be provided on the appliance.

2.7 The appliance shall be capable of performing all normal fire fighting operations in various forms under requiring water pressure.

2.8 The appliance shall be designed to be as compact as possible compactable with ease of accessibility to all parts.

2.9 Lever type valve controls shall be used.

2.10 The water tender shall be fabricated in a manner so as to conform to the following characteristics.

a) Gross vehicle mass : Not less than 15 tones including crew, water and equipment.
b) Maximum speed on level road : 75 km/h. (Fully laden)
c) Acceleration from a standing start through the gears (Fully laden) : 50 km/h in 55 seconds.
d) The appliance shall be capable of being started from rest on a gradient of 1 to 4.
e) When travelling at 45 km/h on a level, dry surface road, the foot brake shall be capable of stopping the vehicle within a distance of 15m from the point at which the brake is applied. The hand brake shall be capable of holding the fully laden appliance on a dry surface gradient of 1 in 4 when in neutral gear.
f) The appliance shall have the following overall dimensions:

Wheel base	: Not more than 5m
Turning circle (dia.)	: Not more than 20m
Road clearance	: Not less than 26cm
Overall width	: Not more than 2.50m

3. MATERIAL

3.1 The choice of material to be used in the construction of the appliance shall be made with a view to combining lightness with strength and durability. The following shall be followed.

a) Pump casing and impeller : lead tin bronze(Grade LTB -2) of IS:318/1981.

b) Impeller ring and impeller neck ring. : Lead tin bronze (Grade LTB-2 of IS:318/1981)

c) Pump shaft : Stainless steel (Grade O4Cr18Ni10)of IS:6603-1972)

3.2 All parts which form water ways or come into contact with water shall be of corrosion-resisting material or should be made of material duly treated for anti-corrosion. All metal parts exposed to atmosphere shall either be of corrosion resisting material or treated.

3.3 Lubricating nipples shall be provided wherever necessary.

4. DESIGN AND CONSTRUCTION

4.1 ENGINE

4.1.1 The engine shall be provided with cooling system to permit its continuous stationary running without overheating. Indirect cooling system shall be in-corporated which shall be of the open circuit type discharging water to the waste.

4.1.2 The operating temperature of the engine-cooling water shall be thermostatically controlled.

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

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

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

4.2 ELECTRICAL SYSTEM

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

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

4.3 WATER TANK

Single tank shall be used with a capacity of 6,000 litres.

4.3.1 The tank constructed out of **STAINLESS STEEL** shall be suitably mounted on the chassis in a manner keeping in view the proper load distribution on the axles. The tank shall be suitably baffled to prevent surge when the vehicle is breaking, cornering or accelerating. The baffles shall be arranged in a manner to facilitate the passage of a man throughout the tank for cleaning purposes. The tank shall be mounted on minimum of three cross members to counter act stress caused by chassis flexing and shall be so secured that it can be removed. The tank body and baffles shall be minimum of 3 mm thick sheet except bottom which shall be 4 mm thick.

4.3.2 Suitable eye shall be provided on the shell of the tank to enable it to be lifted off the vehicle for repairs/replacement as and when necessary.

4.3.3 The tank shall be fitted with not less than 2 over flow pipes of 75 mm or one overflow pipe of 100 mm diameter. The discharge and the overflow pipe shall be taken down below the chassis but without reducing the ground clearance. Two 63 mm instantaneous hydrant connections incorporating a strainer shall be provided close to the pump panel control for filling the tank through 50 mm bore pipe work or feeding the hose reel equipment. A 100 mm bore pipeline shall be taken from the tank to the suction inlet of the pump incorporating a 100 mm quick action spherical type valve. Separate valves for performing the function given in 4.3.7 shall be provided to control the flow of water to the hose reel equipment. Drain plugs for drain cocks shall be provided wherever necessary.

4.3.4 Tank with its fitments shall withstand hydrostatic pressure of 0.3 bar.

4.3.5 Dial gauge water level indicator for the tank shall be provided in the driver's cab and a visual level gauge of line glass tube shall be provided at the control panel calibrated ¼, ½, ¾ and full calibrated in liters

4.3.6 The tank shall have a bolted man hole of minimum 45cm diameter. A cleaning hole of at least 25 cm diameter, shall be provided at the bottom.

4.3.7 The tank shall be connected with the pump and hose reel and valve shall be provided in such a way that any of the following operations are possible.

a) Hydrant –tank
b) Hydrant –reel
c) Tank – pump – reel
d) Hydrant -pump – reel,
e) Tank – pump- -monitor
f) Hydrant –pump-monitor, and
g) Off

4.3.8 WATER MONITOR

One water monitor shall be provided on roof top so that it can be operated manually by a crew member.

4.3.8.1 The monitor shall be capable of traversing through 360 degree in a horizontal plane, elevating from horizontal to 45 degree and depressing from horizontal to not less than 15 degree and fully rotating in both directions.

4.3.8.2 Monitor shall be capable of discharging total rated water tank quantity in not more than two or three minutes

4.3.8.3 The monitor shall be capable of projecting the water to an effective distance of not less than 45 meter in still air when operated at the design pressure in a straight jet pattern without dripping.

4.4 HOSE REEL

4.4.1 One hose reel shall be provided at the rear of the appliance with 60m long of 20 mm bore hose connected t screw 'C' type quick release couplings and terminating with a 8mm shut off nozzle having 8 mm nozzle. The reel may be fitted with friction, brakes and locking device.

4.5 PUMP

4.5.1 A centrifugal pump shall be mounted on rear of the appliance. The pump shall be single stage type. Anti-friction bearings, external to the casing, shall be provided so as to avoid any bearings within the pump casing. The gland shall be of the mechanical self adjusting type. The impeller should be dynamically balanced. A drain cock plug shall be provided at the bottom of the casing. Studs used in the pump casing shall be of stainless steel. In case light alloy castings are used, these shall be of die case and without any blow holes, internal cracks etc. The casting shall withstand the hydraulic pressure given in 4.5.4.

4.5.2 The pump shall be covered completely. However, all the controls on the panel and gauges shall be uncovered. The pump shall be coupled to the prime-mover of the chassis through a power-take-off capable of full torque of the engine used for the appliance. A control lever for engaging and disengaging the pump, with suitable locking device shall be provided in the driver's cab.

4.5.3 The pump shall be designed to give its rated output of 3200 liters per minute at 7 kgf/cm^2. with an engine and pump input at shaft speed safe enough to operate the engine. The pump shall give performance as given in Table 1, when working with strainers(except basket strainer) at 27^{0}C+/-2^{0}C.

Table 1 PUMP PERFORMANCE DATA

Output	Pressure	Lift	Remarks
(1)	(2)	(3)	(4)
l/min	Kgf/cm^2	m	
3200	7	3	When working through two 2.50 m length of specified Suction hose
2250	8.8	3	-do-
1200	7	7	When working through two 10.00 m that is four 2.5 m lengths of specified Suction hose

4.5.3.1 Allowances of Output

a) One percent for every 2.5^{0}C rise in water temperature.
b) Four percent for every 300 m above mean sea-level and
c) No allowance shall be made for humidity up to 75 percent. However, deduction at the rate of 1 percent for every 5 percent change in humidity shall be made when humidity ranges from 75 to 95 percent.

4.5.4 **PUMP TEST**

The pump shall be run for a period of four hours non-stop delivering the rated output at 7 kgf/cm^2 with a lift of 3m. During the test, the water shall not be replenished for the cooling system and the temperature of the engine oil should not exceed 115^{0}C or the engine manufacturer's rated temperature for continuous working whichever is less. The engine should show no sign of stress during the test. The temperature of the cooling water (radiator water) shall not exceed 85^{0}C. The PTO sump oil temperature shall not exceed 100 percent of the manufacturer's recommended temperature for the grade of oil used. The pump casing and impeller shall be subjected to a hydraulic pressure of 21 kgf/cm^2 to detect leakage, perforation etc.

4.6 SUCTION INLET AND DELIVERY VALVES

4.6.1 The pump shall have suction inlet having 125 mm standard suction connection (IS: 902-1974) with internal strainer and blank cap. The strainer shall be retained firmly when in use but shall be easily removable.

4.6.2 The pump shall be provided with four delivery valves having 63 mm standard hose coupling made of Gun Metal(IS:903-1975) with screwed wheel type quick closing clack valve(IS:4928-1968). Blank caps fastened with flexible wire and incorporating means to relieve pressure between the valve and the cap shall be provided one for each delivery valve.

4.7 PRIMER

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

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

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

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

4.7.5 In the case of reciprocating type, the primer shall be designed with a view to prime when the pump is running at speed of 1 000 to 1 500 rpm.

4.8 CENTRAL -PANELS

4.8.1 Adequately illuminated control panel shall be provided at the rear of the appliance.

4.8.2 The control panel shall include the following items.

a) Throttle control for engine.

b) Pressure Gauge 0 to 17.5 kgf/cm^2.

c) Compound Gauge, Calibrated as under

1) Vacuum – 0 to 75 cm (Hg)

2) Pressure - 0 to 6 kgf/cm^2

d) Gauge for cooling water, glow lamp for lubricating system and

e) Cooling water circuit control

f) Control for using water monitor

4.8.3 The following shall also be provided at a convenient position near the control panels: a) Water level indicator

b) Control valve hydrant connection both side near rear tyre.

4.9 BODY WORK

(a) Pressed section of sufficient strength shall be used for super structure.

(b) Extension ladder (35 ft.) shall be mounted on suitable gallows fitted with toilers and designed to facilitate easy and quick removal of the ladder by one man from the rear of the tender.

(c) No. part of the bodywork shall reduce ground clearance of vehicle to less than 36 cm. The highest part of the appliance with the ladder and monitor mounted on it shall not exceed 3.60 Mtr. from the ground leve. The width of the vehicle in ready condition shall not exceed 2.5 meters. The construction of super structure shall not reduce the angles of approach below 30 degree.

(d) A reflective stripes (s) shall be affixed to the perimeter of the apparatus. The stripe or Combination of stripes shall be minimum of 4 inch (100 mm) in total width.

(e) Provision shall be made to store two No. BA sets in the back rest of the driver, officer and the crew seats with suitable clampls and brackets where the BA sets (single cylinder) shall rest and shall not be kept in a hanging condition.

4.10 LOCKERS:-

(a) The Roller shutters have a sturdy locking system to prevent accidental opening while the vehicle is in motion.

(b) The Roller shutters would be of hollow rectangular shaped aluminium links, which are interconnected, sealing the roller shutter watertight when, closed.

(c) These roller shutters would be durable, maintenance free, weather and corrosion resistant.
(f) The Roller shutter shall be equipped with automatic ON/OFF switch for compartment lights.
(g) The hinged lockers shall not be acceptable in any case.
(h) All equipment will be stowed very scientifically & systematically in the lockers & each piece of equipment will have its designed location so that at the time of emergency, the required equipment can be very easily located & removed for use.
(i) Location of equipment (labels) will be provided for immediate identification.
(j) Equipment will be properly clamped & strapped to prevent shifting of the equipment while the vehicle is in motion.

5. **PIPING**: All piping will be sized to have minimum pressure drops & achieve the required pressure & flow at various locations. All pipes fittings & valves (except butterfly valve) will be of SS 316L.

(a) The pipelines will be hydraulically tested at 1.5 times the design pressure.
(b) All lines will be suitably supported so as to provide rigidity & avoid vibrations.
(c) All bolting will be SS 304 or shall be of High Tensile.
(d) The draw off pipe will be provided in such a manner & in such a position that sludge does not pass into form piping.

6. **LADDER GALLOWS-** Gallows shall be provided to carry a 10.5 m extension ladder. The design shall be such that the ladder ca be released without difficulty from a reasonably accessible position and shall embody rollers to permit easy withdrawal by one man. Means shall also be provided for locking the ladder when stowed.

7. **TOOL KIT CONTAINER** -A specially fitted recessed tray for the normal kit of tools, carried on the appliance, shall be provided.

8. **STABILITY** :-The stability of the appliance shall be such that when under fully equipped and loaded, if the surface on which the appliance stands is tilted to either side; the point at which overturning occurs, is not passed at an angle of 30^0 from the horizontal.

9. **WORKMANSHIP AND FINISH** :-

9.1 All parts of the appliance shall be of good workmanship and shall have streamlined finish.

9.2 The appliance shall be painted in fire red colour shade conforming to No.536 of IS:5-1978. The paint shall conform to IS:2932-1974.

10. **INSTRUCTION BOOKS, ACCESSORIES AND EQUIPMENT :-** Instruction Book or Books- Instruction book(s) for the guidance of the user, including both operating and normal maintenance procedures shall be supplied. The book(s) shall include and itemized and illustrated spare parts list giving reference numbers on all the wearing parts.

11. **ACCESSORIES**

11.1 The following accessories shall be provided in addition to those normally fitted on modern commercial vehicles:

a) Fire bell- 250 mm diameter fire bell shall be mounted externally and shall be capable of being operated from within the driving compartment. The bell shall be of the hand operated type.

b)	Head lamps	-	Two
c)	Fog lamps	-	Two
d)	Reversing light	-	Lamp suitable situated to assist reversing.
e)	Amber blinker light	-	Situated on the head of the driving compartment.
f)	Trafficators	-	Illustrated with indicting lights on instrument panel or

in any other prominent position in driving compartment.

g) Wind screen wipers - On both sides of the glass

h) Tools - All tools required for normal routine maintenance of the appliance and which are not included in the kit for the chassis.

i) Siren - Battery operated

j) Search light - Adjustable to give flood or beam light, mounted in a convenient position but capable of being readily disconnected and mounted on a tripod away from the appliance complete with tripod and with not less than 30 m of TRS cable on a reel mounted on the appliance.

k) Spot light - Adjustable, mounted in a convenient position on the rear side of the driving compartment.

l) Inspection lamp - Protected type on wander lead with plug. A socket shall be provided in the control panel in the driver's cab for plugging in the lamp.

m) Tail lamps - Two of combined stop and tail.

n) Rear reflectors -

o) Cab, instrument panel and locker light.

12 **VHF RADIO TELEPHONE**: - Provision to install Standard VHF Radio Telephone to be provided by Fire Tender manufacturer. However VHF Radio telephone is not in the scope of agency.

13 **AIR FIELD OBSTRUCTION MARKING LIGHTS** :- Two such lights shall be mounted. Out of these, one shall be I front and the other at the rear. When switched 'ON' these lights shall be visible from all angles, in the air and from a distance of 6m from the appliance on the ground. Revolving beacon ray type of lights shall be preferred.

14. **PUBLIC ADDRESS SYSTEM :-**A battery operated system with mike in driver's cab and speaker in the top of the vehicle shall be provided.

15. **MARKING**

Each appliance shall be clearly and permanently marked with the following information;

a) Manufactures name and trademark.
b) Year of manufacture
c) Capacity of the pump in lit/min and water tank in litres.
d) Emboss the name and emblem of both SSTPS/NTPC and CISF on either side of the vehicle.

RIGHT SIDE OF TENDER

एनटीपीसी
NTPC

CISF

CENTRAL INDUSTRIAL SECURITY FORCE
(FIRE WING)
SSTPS/NTPC SIPAT BILASPUR (CG) 495555

Y.K. SINGH.

LEFT SIDE OF TENDER

एनटीपीसी
NTPC

केन्द्रीय औद्योगिक सुरक्षा बल
(अग्नि शमन शाखा)
एसएसटीपीएस / एनटीपीसी सीपत बिलासपुर–495555

SPECIAL NOTE

01. The party shall declare the material used in the construction.
02. They shall mention the relevant/governing I.S. specification/International standard of material of the tender and accessories given in Appendix 'A' .
03. Corrosion resistance treatment shall be applied.
04. Vehicles shall conform to the prevailing Motor Vehicle Act & Rules.
05. The party shall give para wise confirmation of technical specification.
06. The party shall confirm guarantee clause with period for tender and accessories in Appendix' A'.
07. The party shall confirm the make of all accessories mentioned in Appendix 'A' in the offer.
08. The party has to confirm the servicing, maintenance and repair of fabricated body, PTO and pump for a period of 05 years in their offer which shall be carried out annually.

APPENDIX A

(CLAUSES 0.2 AND 4.9.3)

SCHEDULE OF EQUIPMENTS TO BE STOWED IN THE APPLIANCE

SL NO	ITEM	QUANTITY
01.	Aluminium Double Extension Ladder 10.5 m Trussed type conf. To IS : 4571	01 No.
02.	a)ISI Marked Delivery hose according to Type B of IS: 636-1979 in 15m lengths fitted with 63mm delivery hose couplings made of Gun metal and binded by copper wires.(see IS:903-1975)	35 Nos.
03.	a)Hose –clamps according to IS:5612(part I)-1977] b) Hose bandages according to IS:5612 (part II)-1977] d)Hose straps e)Hose ramp made of rubber f) Vehicle stopper made of MS	12 Nos. 12 Nos. 12 Nos. 04 Nos. 02 Nos.
04.	Suction hose of rubber of 125 mm internal diameter in 2.5 m lengths according to IS : 2410-1963 fitted with 140 mm suction hose couplings made of Gun metal and binded using copper wires according IS : 902-1974)	04 Nos
05.	Three way suction collecting head with 125mm suction coupling according to IS: 904-1983	01 No
06.	Suction wrenches for 125 mm suction coupling according to IS:4643-1968)	02 No
07.	Suction strainer 125m m size according to IS:907-1965)	02 No
08.	Basket strainer cylindrical type according to IS :3582-1966	04 No
09.	Dividing breeching with control instantaneous pattern 63 mm according to IS : 5131-1969	02 No
10.	Collecting breaching instantaneous pattern 63 mm according to IS :905-1980	02 No
11.	a)Hydrant – stand pipe – two way according to IS: 5714-1981 b)Double female coupling according to IS: 901-1975) c) Hydrant connection, 63 mm double armored hose 1 m long with 63 mm female instantaneous pattern delivery couplings at both ends According to IS 901-1975)	02 No 02 No 02 No

12.	Combined key for hydrant, hydrant cover and lower valve according to IS:910-1980	02 No
13.	Fog nozzle according to IS : 952-1969 with extension applicator with fog head	02 No
14.	Hand controlled branch for 63 mm size hose coupling	02 No
15.	Branch pipe, universal according to IS:2871-1983	02 No
16.	Branch with revolving head according to IS:906-1972	02 No
17.	Branch pipe according to IS :903-1975	02 No
18.	Nozzle of sizes 12 mm, 15 mm, 20 mm and 25 mm (2 each) according to IS : 903-1975	08 No
19.	Adaptor for 125 mm suction female screw coupling and 63 mm male instantaneous. Adaptor double female instantaneous pattern 63 mm. Adaptor double male instantaneous pattern 63 mm	02 No 02 No 02 No
20.	Nozzle spanners according to IS : 903-1975	02 No
21.	Portable electric box lamp with rechargeable accumulator	02 No
22.	Hand lamp (torch – 4 cells)	02 No
23.	Flameproof lamp (usable in the presence of inflammable gases or vapours)	02 No
24.	Self-contained breathing apparatus (compressed air type) complete with spare cylinder and tool kit fully conforming to EN-137. The BA shall be of MSA/Drager make. The cylinder shall be of 06 lit water capacity with free air filling capacity of 1800 litres with 300 bar filling pressure. The BA set shall also contain DSU and electronic signaling and warning unit with digital ambient temperature indicator.	01 set
25.	Foam making branch FMB-5X with pick up tube according to IS :2097-1969	02 Nos.
26.	Lowering line- Hawser laid Manila rope, dia 50 mm, 40 m long according to IS: 1084-1994	01 No
27.	Long line – Hawser laid Manila rope, dia 50 mm, 30 m long according to IS : 1084-1994	01 No
28.	Short line – Hawser laid Manila rope, dia 50 mm, 15 m long according to IS : 1084-1994	01 No

29.	Stretcher folding type conforming to IS :4037 with three straps for holding the casualty in position.	04 No
30.	First aid box for 10 persons	01 No
31.	Rubber gloves in case according to IS; 4770-1968	10 pairs
32.	Asbestos gauntlets	01 pair
33.	Axe, large according to IS : 703-1966	01 No
34.	Spade	01 No
35.	Pick axe according to IS:273-1973	01 No
36.	Crow bar according to IS : 704-1968	01 No
37.	Sledge hammer, 6.5 kg according to IS: 841-1968	01 No
38.	Carpenter 's saw, 60cm with handle according to IS: 5098-1969	02 No
39.	Spanner, adjustable, 30 cm long handle according to IS:6149- 1971	01 No
40.	Door breaker	01 No
41.	Hydraulic jack 15 tonnes	01 No
42.	Fire hook according to IS :927-1981	01 No
43.	Tool kit	01 No
44.	Grease gun	02 No
45.	Oil feeder	01 No
46.	Can for oil-2 litres capacity	01 No
47.	Funnel for oil or fuel filling	01 No

DY COMMANDANT/FIRE
CISF UNIT NTPC SIPAT

Indicative QP of DCP Tender

Sr. No.	Component / Operation	Characteristics	Class of Check	Type of Check	Quantum of Check		Reference Documents	Acceptance Norms	Format of Records		Agency			Remarks
					M	C/N					M	C	N	
1	2	3	4	5	6		7	8	9	D	10			11
1.	**Chassis**	Make, Engine No. & Chassis No.	Major	Correlation	100%	100 %	Vehicle Mfr. / authorized dealer documents	Vehicle Mfr. / authorized dealer documents		√	P	V	V	Test Report from NABL approved lab
2.	**Raw Material**													
a)	MS/ SS / GI/ AL / CHEQUERED PLATE/ Structural Components	Chemical & Mechanically property	Major	Chemical & Mechanically property	1 / Lot	1 / Lot	Approved Drg. / DS/ IS: 10993	Approved Drg. / DS/ IS: 10993	T.C.	√	P	V	V	
3.	**Final Inspection of complete DCP Fire Truck**	a) Leakage Test of DCP Pipeline & Valves,	Major	Visual	100%	100 %	Approved Drg. / DS/ IS: 10993	Approved Drg. / DS/ IS: 10993	IR	√	P	V	V	
		b) Road Test & Braking test , Turning Circle	Major	Visual	100%	100 %	Approved Drg. / DS/ IS: 10993	Approved Drg. / DS/ IS: 10993	IR	√	P	W	W	
		c) Control Panel Operation check	Major	Operational	100%	100 %	Approved Drg. / DS/ IS: 10993	Approved Drg. / DS/ IS: 10993	IR	√	P	W	W	
		d) DCP Vessel (2x1000 Kgs.)	Major	Leakage	100%	100 %	Approved Drg. / DS/ IS: 10993	Approved Drg. / DS/ IS: 10993	IR	√	P	V	V	

		LEGENDS:- * RECORDS, INDENTIFIED WITH "TICK" (√) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION. M – MANUFACTURER / SUB SUPPLIER / APPROVED LAB; C – MAIN SUPPLIER; N – PVUNL P - PERFORM; W - WITNESS, V – VERIFICATION AS APPROPRIATE, CHP: PVUNL SHALL IDENTIFY IN COLUMN "N" AS "W"			
MANUFACTURER / SUB – SUPPLIER	**MAIN SUPPLIER**		**REVIEWED BY**	**APPROVED BY**	**APPROVAL SEAL**
SIGNATURE					

ENGG. DIV / QA & I

Indicative QP of DCP Tender

Sr. No.	Component / Operation	Characteristics	Class of Check	Type of Check	Quantum of Check		Reference Documents	Acceptance Norms	Format of Records		Agency			Remarks
					M	C/N					M	C	N	
1	2	3	4	5	6		7	8	9	D	10			11
		e) Hose reel, Performance test	Major	Functional	100%	100 %	Approved Drg. / DS/ IS: 10993	Approved Drg. / DS/ IS: 10993	IR	√	P	W	W	
		f) Monitor Performance Test	Major	Functional	100%	100 %	Approved Drg. / DS/ IS: 10993	Approved Drg. / DS/ IS: 10993	IR	√	P	W	W	
		g) Completeness of Equipment	Major	Verification of various accessories	100%	100 %	Approved Drg. / DS/ IS: 10993	Approved Drg. / DS/ IS: 10993	IR	√	P	W	W	
		h) Determination of Actual pay load	Major	Visual	100%	100 %	Approved Drg. / DS/ IS: 10993	Approved Drg. / DS/ IS: 10993	IR	√	P	W	W	
		i) Static Stability test	Major	Visual	100%	100 %	Approved Drg. / DS/ IS: 10993	Approved Drg. / DS/ IS: 10993	IR	√	P	W	W	
		j) Painting Quality (both Internal & External)	Major	DFT, Paint shade	100%	100 %	Approved Drg. / DS/ IS: 10993	Approved Drg. / DS/ IS: 10993	IR	√	P	V	V	

Note:

1. Manufacturer TC for DCP Monitor, DCP vessel, and Hose reel shall be produced for verification during Final Inspection.
2. PESO approved for all Nitrogen Cylinders will be submitted.

A) Reference and Acceptance norms shall be derived from following in the same sequence-
1) NTPC Approved drawing / data sheet ; 2) NTPC tech specs ; 3) Purchase Order ; 4) Relevant national standard 5) Relevant International standard ; 6) Manufacturer's standard 7) Good Engineering practices
B) Main Contractor Column may please be ignored.
C) Joint Inspection along with CISF shall be carried out
D) PMI shall be carried out on alloy steel accessible parts during final inspection.

		SUPPLIER IN QA DOCUMENTATION. M – MANUFACTURER / SUB SUPPLIER / APPROVED LAB; C – MAIN SUPPLIER; N – PVUNL P - PERFORM; W - WITNESS, V – VERIFICATION AS APPROPRIATE, CHP: PVUNL SHALL IDENTIFY IN COLUMN "N" AS "W"			
MANUFACTURER / SUB – SUPPLIER	**MAIN SUPPLIER**		**REVIEWED BY**	**APPROVED BY**	**APPROVAL SEAL**
SIGNATURE					

ENGG. DIV / QA & I

INDICATIVE QUALITY PLAN FOR FIRE WATER TENDER

Sr. No.	Component / Operation	Characteristics	Class of Check	Type of Check	Quantum of Check		Reference Documents	Acceptance Norms	Format of Records		Agency			Remarks
					M	C/N					M	C	N	
1	2	3	4	5	6		7	8	9	D	10			11
1.	**Chassis**	Make, Engine No. & Chassis No.	Major	Correlation	100%	100 %	Vehicle Mfr. / authorized dealer documents	Vehicle Mfr. / authorized dealer documents		√	P	V	V	
2.	**Raw Material**													
a)	MS/SS PLATE FOR TANK AL/ GI/ CHEQUERED PLATES	Chemical & Mechanically property	Major	Chemical & Mechanically property	1 / Lot	1 / Lot	Approved Drg. / DS,	Approved Drg. / DS/	T.C.	√	P	V	V	Test Report of approved Lab for drawn sample from 1 /Lot
b)	Raw material for Pump casing, impeller and shaft	Chemical & Mechanical		Chemical & Mechanical	1 / Lot	1 / Lot	Approved Drg. / DS	Approved Drg. / DS	T.C.	√	P	V	V	Test Report of approved Lab for drawn sample from 1 /Lot

.		**LEGENDS:-** * RECORDS, INDENTIFIED WITH "TICK" (√) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION. M – MANUFACTURER / SUB SUPPLIER; C – MAIN SUPPLIER; N – PVUNL P - PERFORM; W - WITNESS, V – VERIFICATION AS APPROPRIATE, CHP: PVUNL SHALL IDENTIFY IN COLUMN "N" AS "W"	Page 1 of 4 .		
MANUFACTURER / SUB – SUPPLIER	**MAIN SUPPLIER**			**REVIEWED BY**	**APPROVED BY**	**APPROVAL SEAL**
SIGNATURE						

INDICATIVE QUALITY PLAN FOR FIRE WATER TENDER

Sr. No.	Component / Operation	Characteristics	Class of Check	Type of Check	Quantum of Check		Reference Documents	Acceptance Norms	Format of Records		Agency			Remarks
					M	C/N					M	C	N	
1	2	3	4	5	6		7	8	9	D	10			11
3.	**Inprocess**													
a)	Fabrication of Water tank	Visual & Dimension Incl.	Minor	Dimensional (Visual)	100%	100 %	Approved Drg. / DS	Approved Drg. / DS/	IR	√	P	V	V	
b)	Leak test of Water Tank	Leak test	Major	Leak test	100%	100 %	Approved Drg. / DS,	No Leakage	IR	√	P	V	V	
c)	Pump casing	Hydro test	Major	Hydro Test	100%	100 %	Approved Drg./ DS	No Leakage	IR	√	P	V	V	
d)	Impeller	Dynamic Balancing	Major	Balancing report	100%	100 %	ISO 1940 GR. 6.3	ISO 1940 GR. 6.3	Balancing report	√	P	V	V	
e)	Ultrasonic test on shaft for dia. > 50mm	Sub-surface defects	Major	Ultrasonic test	100%	100 %	ASTM A 388	When back wall Echo (BWE) set to 100% Full screen Height (FSH), a defect echo > 20% FSH is not acceptable. Also loss of BWE>20% is not acceptable	Ultrasonic test report	√	P	V	V	

MANUFACTURER / SUB – SUPPLIER	MAIN SUPPLIER	**LEGENDS:-**	Page 2 of 4	REVIEWED BY	APPROVED BY	APPROVAL SEAL
SIGNATURE		* RECORDS, INDENTIFIED WITH "TICK" (√) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION. M – MANUFACTURER / SUB SUPPLIER; C – MAIN SUPPLIER; N – PVUNL P - PERFORM; W - WITNESS, V – VERIFICATION AS APPROPRIATE, CHP: PVUNL SHALL IDENTIFY IN COLUMN "N" AS "W"				

INDICATIVE QUALITY PLAN FOR FIRE WATER TENDER

Sr. No.	Component / Operation	Characteristics	Class of Check	Type of Check	Quantum of Check		Reference Documents	Acceptance Norms	Format of Records		Agency			Remarks
					M	C/N					M	C	N	
1	2	3	4	5	6		7	8	9	D	10			11
4.	**Final Inspection of complete Fire Truck**	a) Leakage Test of Pipeline & Valves,	Major	Visual	100%	100 %	Approved Drg./ DS	Approved Drg./ DS	IR	√	P	V	V	
		b) Road Test & Braking test , TURNING CIRCLE	Major	Visual	100%	100 %	Approved Drg./ DS	Approved Drg./ DS	IR	√	P	W	W	
		c) Pump Running Test & performance (Including PTO test)	Major	Four Hour run test operational	100%	100 %	Approved Drg./ DS	Approved Drg./ DS Smooth shifting and no leakage	IR	√	P	W	W	
		d) Priming Performance test	Major	Operational	100%	100 %	Approved Drg./ DS	Approved Drg./ DS	IR	√	P	W	W	
		e) Control Panel Operation check	Major	Operational	100%	100 %	Approved Drg./ DS	Approved Drg./ DS	IR	√	P	W	W	
		f) Monitor Performance Test	Major	Functional	100%	100 %	Approved Drg./ DS	Approved Drg./ DS	IR	√	P	W	W	
		g) Water Hose reels testing	Major	Functional	100%	100 %	Approved Drg./ DS	Approved Drg./ DS	IR	√	P	W	W	
		h) Electrical Function Test	Major	Functional	100%	100 %	Approved Drg./ DS	Approved Drg./ DS	IR	√	P	W	W	

MANUFACTURER / SUB – SUPPLIER	MAIN SUPPLIER	**LEGENDS:-** * RECORDS, INDENTIFIED WITH "TICK" (√) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION. M – MANUFACTURER / SUB SUPPLIER; C – MAIN SUPPLIER; N – PVUNL P - PERFORM; W - WITNESS, V – VERIFICATION AS APPROPRIATE, CHP: PVUNL SHALL IDENTIFY IN COLUMN "N" AS "W"	Page 3 of 4	REVIEWED BY	APPROVED BY	APPROVAL SEAL
SIGNATURE						

INDICATIVE QUALITY PLAN FOR FIRE WATER TENDER

Sr. No.	Component / Operation	Characteristics	Class of Check	Type of Check	Quantum of Check		Reference Documents	Acceptance Norms	Format of Records		Agency			Remarks
					M	C/N					M	C	N	
1	2	3	4	5	6		7	8	9	D	10			11
		i) Determination of Actual pay load	Major	Visual	100%	100 %	Approved Drg./ DS	Approved Drg./ DS	IR	√	P	W	W	
		j) Static Stability test	Major	Visual	100%	100 %	Approved Drg./ DS	Approved Drg./ DS	IR	√	P	W	W	
		k) Completeness of Equipment	Major	Verification of various accessories	100%	100 %	Approved Drg./ DS	Approved Drg./ DS	IR	√	P	W	W	
		l) Painting Quality (both Internal & External)	Major	DFT, Paint shade	100%	100 %	Approved Drg./ DS	Approved Drg./ DS	IR	√	P	V	V	

Note:

1. Manufacturer TC for Branch Pipe / Coupling / Nozzle and Hose shall be produced for verification during Final Inspection.
2. Main contractor's column may please be ignored as per applicability.
3. For Reference and Acceptance norms for various tests in the QP, following shall be referred in the mentioned sequence -

a.) NTPC Approved drawing / data sheet b.) NTPC purchase order c.) Drawing / data sheet referred during Original equipment supply (if applicable) d.) Applicable national standard e.) Applicable international standard f.) Manufacturer's approved drawing / data sheet / catalogue g.) Good engineering practices

4. Joint Inspection along with CISF shall be carried out by NTPC.

		LEGENDS:- * RECORDS, INDENTIFIED WITH "TICK" (√) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION. M – MANUFACTURER / SUB SUPPLIER; C – MAIN SUPPLIER; N – PVUNL P - PERFORM; W - WITNESS, V – VERIFICATION AS APPROPRIATE, CHP: PVUNL SHALL IDENTIFY IN COLUMN "N" AS "W"	Page 4 of 4		
MANUFACTURER / SUB – SUPPLIER	**MAIN SUPPLIER**		**FOR PVUNL USE**	**REVIEWED BY**	**APPROVED BY**	**APPROVAL SEAL**
SIGNATURE						

5. PMI on accessible alloy steel components to be carried out at the time of final inspection. PMI shall be arranged by Manufacturer.

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Indicative QP of Foam Tender

Sr. No.	Component / Operation	Characteristics	Class of Check	Type of Check	Quantum of Check		Reference Documents	Acceptance Norms	Format of Records		Agency			Remarks
					M	C/N					M	C	N	
1	2	3	4	5	6		7	8	9	D	10			11
1.	**Chassis**	Make, Engine No. & Chassis No.	Major	Correlation	100%	100 %	Vehicle Mfr. / authorized dealer documents	Vehicle Mfr. / authorized dealer documents		√	P	V	V	
2.	**Raw Material**													
a)	MS / SS Plate	Chemical & Mechanically property	Major	Chemical & Mechanically property	1 / Lot	1 / Lot	PO / Approved Drg./ DS		T.C.	√	P	V	V	Test Report from NABL approved lab
b)	GI / AL / CHEQUERED PLATE/ STRUCTURAL COMPONENTS	Chemical & Mechanically property	Major	Chemical & Mechanically property	1 / Lot	1 / Lot			T.C.	√	P	V	V	
c)	Raw material for Pump casing, impeller and shaft	Chemical & Mechanical		Chemical & Mechanical	1 / Lot	1 / Lot			T.C.	√	P	V	V	

MANUFACTURER / SUB – SUPPLIER	**MAIN SUPPLIER**
SIGNATURE	

LEGENDS:-

* RECORDS, INDENTIFIED WITH "TICK" (√) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION.

M – MANUFACTURER / SUB SUPPLIER; C – MAIN SUPPLIER; N – PVUNL

P - PERFORM; W - WITNESS, V – VERIFICATION AS APPROPRIATE,

CHP: PVUNL SHALL IDENTIFY IN COLUMN "N" AS "W"

ENGG. DIV / QA & I

Indicative QP of Foam Tender

Sr. No.	Component / Operation	Characteristics	Class of Check	Type of Check	Quantum of Check		Reference Documents	Acceptance Norms	Format of Records		Agency			Remarks
					M	C/N					M	C	N	
1	2	3	4	5	6		7	8	9	D	10			11
3.	**Inprocess**													
a)	Fabrication of Water and Foam tank	Visual & Dimension Incl.	Minor	Dimensional (Visual)	100%	100 %	PO / Approved Drg./ DS		IR	√	P	V	V	
b)	Leak test of Water and Foam Tank	Leak test	Major	Leak test	100%	100 %	PO / Approved Drg./ DS	No Leakage	IR	√	P	V	V	
c)	Pump casing	Hydro test	Major	21 Kg/cm^2	100%	100 %		No Leakage	IR	√	P	V	V	
d)	Impeller	Dynamic Balancing	Major	Balancing report	100%	100 %	ISO 1940 GR. 6.3	ISO 1940 GR. 6.3	Balancing report	√	P	V	V	
e)	Ultrasonic test on shaft for dia. > 50mm	Sub-surface defects	Major	Ultrasonic test	100%	100 %	ASTM A 388	When back wall Echo (BWE) set to 100% Full screen Height (FSH), a defect echo > 20% FSH is not acceptable. Also loss of BWE>20% is not acceptable	Ultrasonic test report	√	P	V	V	

MANUFACTURER / SUB – SUPPLIER	MAIN SUPPLIER	**LEGENDS:-** * RECORDS, INDENTIFIED WITH "TICK" (√) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION. M – MANUFACTURER / SUB SUPPLIER; C – MAIN SUPPLIER; N – PVUNL P - PERFORM; W - WITNESS, V – VERIFICATION AS APPROPRIATE, CHP: PVUNL SHALL IDENTIFY IN COLUMN "N" AS "W"		REVIEWED BY	APPROVED BY	APPROVAL SEAL
SIGNATURE						

ENGG. DIV / QA & I

Indicative QP of Foam Tender

Sr. No.	Component / Operation	Characteristics	Class of Check	Type of Check	Quantum of Check		Reference Documents	Acceptance Norms	Format of Records		Agency			Remarks
					M	C/N					M	C	N	
1	2	3	4	5	6		7	8	9	D	10			11
4.	**Final Inspection of complete Fire Tender**	a) Leakage Test of Pipeline & Valves,	Major	Visual	100%	100 %	PO / Approved Drg./ DS		IR	√	P	V	V	
		b) Road Test & Braking test	Major	Visual	100%	100 %			IR	√	P	W	W	
		c) Pump Running Test & performance (including PTO test)	Major	Four Hour run test operational	100%	100 %	PO / Approved Drg./ DS No leakage		IR	√	P	W	W	
		d) Priming Performance test	Major	Operational	100%	100 %	PO / Approved Drg./ DS		IR	√	P	W	W	
		e) Control Panel Operation check	Major	Operational	100%	100 %			IR	√	P	W	W	
		f) Monitor Performance Test	Major	Functional	100%	100 %			IR	√	P	W	W	
		g) Water Hose reel testing	Major	Functional	100%	100 %			IR	√	P	W	W	
		h) Electrical Function Test	Major	Functional	100%	100 %			IR	√	P	W	W	

MANUFACTURER / SUB – SUPPLIER	**MAIN SUPPLIER**	**LEGENDS:-** * RECORDS, INDENTIFIED WITH "TICK" (√) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION. M – MANUFACTURER / SUB SUPPLIER; C – MAIN SUPPLIER; N – PVUNL P - PERFORM; W - WITNESS, V – VERIFICATION AS APPROPRIATE, CHP: PVUNL SHALL IDENTIFY IN COLUMN "N" AS "W"	**REVIEWED BY**	**APPROVED BY**	**APPROVAL SEAL**
SIGNATURE					

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Indicative QP of Foam Tender

Sr. No.	Component / Operation	Characteristics	Class of Check	Type of Check	Quantum of Check		Reference Documents	Acceptance Norms	Format of Records		Agency			Remarks
					M	C/N					M	C	N	
1	2	3	4	5	6		7	8	9	D	10			11
		i) Articulation test and Shower test	Major	Visual	100%	100 %	PO / Approved Drg./ DS		IR	√	P	W	W	
		j) Determination of Actual pay load	Major	Visual	100%	100 %			IR	√	P	W	W	
		k) Static Stability test & Gradient Test	Major	Visual	100%	100 %			IR	√	P	W	W	
		l) Completeness of Equipment	Major	Verification of various accessories	100%	100 %			IR	√	P	W	W	
		m) Painting Quality (both Internal & External)	Major	DFT, Paint shade	100%	100 %			IR	√	P	V	V	

Note:

1. Manufacturer TC for Foam Monitor, Foam compound Proportioner, Branch Pipe / Coupling / Nozzle and Hose shall be produced for verification during Final Inspection.

A) Reference and Acceptance norms shall be derived from following in the same sequence-
1) NTPC Approved drawing / data sheet ; 2) NTPC tech specs ; 3) Purchase Order ; 4) Relevant national standard 5) Relevant International standard ; 6) Manufacturer's standard 7) Good Engineering practices
B) Main Contractor Column may please be ignored.
C) Joint Inspection along with CISF shall be carried out
D) PMI shall be carried out on alloy steel accessible parts during final inspection.

M – MANUFACTURER / SUB SUPPLIER; C – MAIN SUPPLIER; N – PVUNL
P - PERFORM; W - WITNESS, V – VERIFICATION AS APPROPRIATE,
CHP: PVUNL SHALL IDENTIFY IN COLUMN "N" AS "W"

MANUFACTURER / SUB – SUPPLIER	MAIN SUPPLIER		REVIEWED BY	APPROVED BY	APPROVAL SEAL
SIGNATURE					

ENGG. DIV / QA & I

Indicative QP of Multipurpose Fire Tender

Sr. No.	Component / Operation	Characteristics	Class of Check	Type of Check	Quantum of Check		Reference Documents	Acceptance Norms	Format of Records		Agency			Remarks
					M	C/N					M	C	N	
1	2	3	4	5	6		7	8	9	D	10			11
1.	**Chassis**	Make, Engine No. & Chassis No.	Major	Correlation	100%	100 %	Vehicle Mfr. / authorized dealer documents	Vehicle Mfr. / authorized dealer documents		√	P	V	V	
2.	**Raw Material**													
a)	M.S. Plate for Water tank ,AL / GI Plates , Chequered Plates	Chemical & Mechanical property	Major	Chemical & Mechanically property	1 / Lot	1 / Lot	PO/ Approved Drg./ DS	PO/ Approved Drg./ DS	T.C.	√	P	V	V	Test report of NABL approved lab for drawn sample
b)	S.S. Plate for Foam tank	Chemical & Mechanical property	Major	Chemical & Mechanically property	1 / Lot	1 / Lot	PO/ Approved Drg./ DS	PO/ Approved Drg./ DS	T.C.	√	P	V	V	Test report of NABL approved lab for drawn sample
c)	Raw material for Pump casing, impeller and shaft	Chemical & Mechanical		Chemical & Mechanical	1 / Lot	1 / Lot	PO/ Approved Drg./ DS	PO/Approved Drg./ DS	T.C.	√	P	V	V	Test report of NABL approved lab for drawn sample

MANUFACTURER / SUB – SUPPLIER	**MAIN SUPPLIER**	**LEGENDS:-** * RECORDS, INDENTIFIED WITH "TICK" (√) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION. M – MANUFACTURER / SUB SUPPLIER; C – MAIN SUPPLIER; N – PVUNL P - PERFORM; W - WITNESS, V – VERIFICATION AS APPROPRIATE, CHP: PVUNL SHALL IDENTIFY IN COLUMN "N" AS "W"	**FOR PVUNL USE**	**REVIEWED BY**	**APPROVED BY**	**APPROVAL SEAL**
SIGNATURE						

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Indicative QP of Multipurpose Fire Tender

Sr. No.	Component / Operation	Characteristics	Class of Check	Type of Check	Quantum of Check		Reference Documents	Acceptance Norms	Format of Records		Agency			Remarks
					M	C/N					M	C	N	
1	2	3	4	5	6		7	8	9	D	10			11
3.	**Inprocess**													
a)	Fabrication of Water and Foam tank	Visual & Dimension Incl.	Minor	Dimensional (Visual)	100%	100 %	PO/ Approved Drg./ DS		IR	√	P	V	V	Fabrication of tank shall be carried out as per approved WPS & PQR by TPI.
b)	Leak test of Water and Foam Tank	Leak test	Major	Leak test	100%	100 %	PO/ Approved Drg./ DS	No Leakage	IR	√	P	W	W	
c)	Pump casing	Hydro test	Major	Hydro Test	100%	100 %	PO/ Approved Drg./ DS	No Leakage	IR	√	P	V	V	
d)	Impeller	Dynamic Balancing	Major	Balancing report	100%	100 %	ISO 1940 GR. 6.3	ISO 1940 GR. 6.3	Balancing report	√	P	V	V	
e)	Ultrasonic test on shaft for dia. > 50mm	Sub-surface defects	Major	Ultrasonic test	100%	100 %	ASTM A 388	When back wall Echo (BWE) set to 100% Full screen Height (FSH), a defect echo > 20% FSH is not acceptable. Also loss of BWE>20% is not acceptable	Ultrasonic test report	√	P	V	V	
f)	Leak test of Piping	Hydro test	Major	Hydro	100 %	100 %	Tech. Spec./ PO	No leakage	IR	Y	P	V	V	

LEGENDS:-

* RECORDS, INDENTIFIED WITH "TICK" (√) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION.

M – MANUFACTURER / SUB SUPPLIER; C – MAIN SUPPLIER; N – PVUNL

P - PERFORM; W - WITNESS, V – VERIFICATION AS APPROPRIATE,

CHP: PVUNL SHALL IDENTIFY IN COLUMN "N" AS "W"

MANUFACTURER / SUB – SUPPLIER	MAIN SUPPLIER	FOR PVUNL USE	REVIEWED BY	APPROVED BY	APPROVAL SEAL
SIGNATURE					

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Indicative QP of Multipurpose Fire Tender

Sr. No.	Component / Operation	Characteristics	Class of Check	Type of Check	Quantum of Check		Reference Documents	Acceptance Norms	Format of Records		Agency			Remarks
					M	C/N					M	C	N	
1	2	3	4	5	6		7	8	9	D	10			11
4.	**Final Inspection of complete Fire Tender**	a) Leakage Test of Pipeline & Valves,	Major	Visual	100%	100 %	PO/ Approved Drg./ DS		IR	√	P	V	V	
		b) Road Test & Braking test , Shower Test	Major	Visual	100%	100 %			IR	√	P	W	W	
		c) Pump Running Test & performance (including PTO test)	Major	Four Hour run test operational	100%	100 %	PO/ Approved Drg./ DS	PO/ Approved Drg./ DS No leakage	IR	√	P	W	W	
		d) Priming Performance test	Major	Operational	100%	100 %	PO/ Approved Drg./ DS		IR	√	P	W	W	
		e) Control Panel Operation check	Major	Operational	100%	100 %			IR	√	P	W	W	
		f) Monitor Performance Test & foam equipment test	Major	Functional	100%	100 %			IR	√	P	W	W	
		g) Water Hose reel testing	Major	Functional	100%	100 %			IR	√	P	W	W	
		h) Electrical Function Test	Major	Functional	100%	100 %			IR	√	P	W	W	

		LEGENDS:-				
MANUFACTURER / SUB – SUPPLIER	**MAIN SUPPLIER**	* RECORDS, INDENTIFIED WITH "TICK" (√) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION. M – MANUFACTURER / SUB SUPPLIER; C – MAIN SUPPLIER; N – PVUNL P - PERFORM; W - WITNESS, V – VERIFICATION AS APPROPRIATE, CHP: PVUNL SHALL IDENTIFY IN COLUMN "N" AS "W"	**FOR PVUNL USE**	**REVIEWED BY**	**APPROVED BY**	**APPROVAL SEAL**
SIGNATURE						

ENGG. DIV / QA & I

Indicative QP of Multipurpose Fire Tender

Sr. No.	Component / Operation	Characteristics	Class of Check	Type of Check	Quantum of Check		Reference Documents	Acceptance Norms	Format of Records		Agency			Remarks
					M	C/N					M	C	N	
1	2	3	4	5	6		7	8	9	D	10			11
		i) DCP & Co2 Fire Extinguishers (Performance Report & CCOE approval)	Major	Performance Report & CCOE approval	100%	100 %	PO/ Approved Drg./ DS		IR	√	P	V	V	
		j) Determination of Actual pay load	Major	Visual	100%	100 %			IR	√	P	W	W	
		k) Static Stability test	Major	Visual	100%	100 %			IR	√	P	W	W	
		l) Completeness of Equipment	Major	Verification of various accessories	100%	100 %			IR	√	P	W	W	
		m) Painting Quality (both Internal & External)	Major	DFT, Paint shade	100%	100 %			IR	√	P	V	V	

Note:

1. Manufacturer TC for Foam Monitor, Foam compound Proportioner, Branch Pipe / Coupling / Nozzle and Hose shall be produced for verification during Final Inspection.
2. Main contractor's column may please be ignored as per applicability.
3. For Reference and Acceptance norms for various tests in the QP, following shall be referred in the mentioned sequence -
   a.) NTPC Approved drawing / data sheet
   b.) NTPC purchase order
   c.) Drawing / data sheet referred during Original equipment supply (if applicable)
   d.) Applicable national standard
   e.) Applicable international standard
   f.) Manufacturer's approved drawing / data sheet / catalogue
   g.) Good engineering practices
4. Joint Inspection along with CISF shall be carried out by NTPC.
5. PMI on accessible alloy steel components to be carried out at the time of final inspection. PMI shall be arranged by Manufacturer.