KARNATAKA POWER CORPORATION LIMITED

1x370 MW YELAHANKA COMBINED CYCLE POWER PLANT

TECHNICAL SPECIFICATION

FOR

FIRE TENDER

SPECIFICATION NO. : PE-TS-409-550-A001

BHARAT HEAVY ELECTRICALS LIMITED
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
NOIDA (INDIA)

CONTENTS

SECTION – I

SPECIFIC TECHNICAL REQUIREMENT

1.0 INTENT OF SPECIFICATION

1.1 This specification covers the design, material, fabrication, manufacturing, inspection and testing at manufacturer's work, suitable painting and performance requirement of Fire Tender complete with all accessories as specified, transportation to project site, freight and insurance including performance demonstration at site.

The bidder's scope shall also include any other services, etc. if called for in the succeeding sections of the specification.

1.2 It is not the intent to specify completely all details and construction of the equipment. However, all the equipment shall conform, in all respect, to high standard of engineering, design and workmanship and be capable of performing in continuous commercial operation up to desired period.

1.3 BIDDER's guarantee in a manner acceptable to the PURCHASER who will interpret the meaning of drawing and specification and shall have power to reject any work or material which, in his judgement, are not in full accordance with specified specification and technical parameter.

1.4 The extent of supply under the contract includes all items shown in the drawings, notwithstanding the fact that such items may have been omitted from the specification or schedules. Similarly, the extent of supply also includes all items mentioned in the specification and /or schedules, notwithstanding the fact that such items may have been omitted in the drawing.

1.5 Items though not specifically mentioned but needed to make the system complete as stipulated under these specifications are also to be furnished unless otherwise specifically excluded.

1.6 The general terms and conditions, instructions to tenderer and other attachment referred to elsewhere are hereby made part of the tender specifications. The equipment / material and works covered by this specification is subject to compliance to all the attachments referred in the specification. The tenderer shall be responsible for adherence to all requirements stipulated herein.

1.7 While all efforts have been made to make the specification requirement complete & unambiguous, it shall be bidders' responsibility to ask for missing information, ensure completeness of specification, to bring out any contradictory / conflicting requirement in different sections of the specification and within a section itself to the notice of BHEL and to seek any clarification on specification requirement in the format enclosed under Vol.-III of the specification within 10 days of receipt of tender documents. In absence of any such clarifications, in case of any contradictory requirement, the more stringent requirement as per interpretation of Purchaser/Customer shall prevail and shall be complied by the bidder without any commercial implication on account of the same. Further in case of any missing information in the specification not brought out by the prospective bidders as part of pre-bid clarification, the same shall be furnished by Purchaser/ Customer as and when brought to their notice either by the bidder or by purchaser/ customer themselves. However, such

requirements shall be binding on the successful bidder without any commercial & delivery implication.

1.8 No deviation is permitted in normal case. Deviations, if any, should be very clearly brought out clause by clause in the enclosed schedule otherwise, it will be presumed that the vendor's offer is strictly in line with NIT specification.

1.9 In case all above requirements are not complied with, the offer may be considered as incomplete and would become liable for rejection.

1.10 Unless specified otherwise, all through the specification, the word contractor shall have same meaning as successful bidder/vendor and Customer/Purchaser/Employer will mean BHEL and/or Customer (**KARNATAKA POWER CORPORATION LIMITED**) as interpreted by BHEL in the relevant context. Please refer GCC/SCC for better clarity.

1.11 In the event of conflict between requirements of two clauses of this specification/ documents or requirements of different codes/standard specified, the more stringent requirement as per interpretation of owner shall apply.

1.12 The equipment covered under this specification shall not be dispatched unless the same have been finally inspected, accepted and dispatch release issued by BHEL/Customer.

1.13 BHEL's Customer's representative shall be given full access to the shop in which the equipment's are being manufactured or tested and all test records shall be made available to him.

1.14 Various codes and standards to be used shall be as indicated in various parts of the specification. In case bidder uses any standard other than those indicated in the specification, the onus of establishing equivalence of the same with the specified standards will rest with the bidder and acceptance of the same shall be sole prerogative of customer. The bidder will also arrange for BHEL a copy of the standards in ENGLISH language. The cost of such service will be deemed to have been included by the bidder in the total cost of the package. BHEL will not entertain any additional cost on account of the same.

1.15 All text/ numeric in the document / drawings to be generated by the successful bidder will be in English language only.

1.16 The bidder's offer shall not carry any sections like clarification, interpretations and /or assumptions.

1.17 The inspection and testing of all the equipment shall be as per approved quality Plan/Inspection checklist.

Note:

Bidder to note that BHEL reserves the right for drawing/document submission through web based Document. Management System. Bidder would be provided access to the DMS for drawing/document approval and adequate training for the same. Detailed methodology would be finalized during the kick-off meeting. Bidder to ensure following at their end.

- Internet explorer version – Minimum Internet Explorer 7.

• Internet speed – 2 mbps (Minimum preferred).

• Pop ups from our external DMS IP (124.124.36.198) should not be blocked.

• Vendor's internal proxy setting should not block DMS application's link (http://dmsserver. bhelpem.com/Wrench%20Web%20Access/Login.aspx.).

SECTION – IA

SPECIFIC TECHNICAL REQUIREMENTS (MECHANICAL)

1.0.0 SCOPE

1.1.0 SCOPE OF SUPPLY

i) Foam tender (1 no.), conforming to latest IS: 10460, complete with all accessories and equipment's as specified herein & including those specified in Section IIA of this specification.

ii) Fire water tender (1 no.) ,conforming to latest IS: 950 Type B, complete with all accessories and equipment's as specified herein & including those specified in Section IIB of this specification.

iii) First fill of chemicals & consumables during performance demonstration.

iv) Replenishment of consumables & chemicals consumed during performance demonstration of tenders.

1.2.0 SCOPE OF SERVICES

Performance demonstration of fire water and foam tenders at site and training of owner's personnel.

2.0.0 CODES AND STANDARDS

The design, material of construction, workmanship & finish, performance testing, accessories and equipments of fire water tender and foam tender specified herein shall comply with the requirements of codes/standard as follows:

Latest IS: 10460 - Functional requirements for small foam tender for fire brigade use.

Latest IS: 950 Type-B - Functional requirements for fire water tender, Type-B for fire brigade use.

3.0.0 GENERAL REQUIREMENTS

3.1.0 Permanent Registration and one year insurance of the vehicle in the name of ultimate customer will be in the scope of the bidder.

3.2.0 Temporary registration and on-road insurance for the vehicles shall be in the scope of bidder.

3.2.0A Hook of 500 kg. capacity for drill tower as per IS 15560.

FOAM TENDER

3.3.0 VEHICLE CHASSIS

The chassis for carrying out fabrication work of foam tender shall be of Make-TATA/Ashok Leyland/equivalent. The chassis shall be equipped with power assisted steering and power brake.

Note:- The chassis shall be of BS-IV compliant as per prevailing emission norms and shall totally comply with the Central Motor Vehicle Rules/ Ministry of Road Transport & Highways notification etc., for the Yelahanka Plant where the vehicle is intended to be used.

3.4.0 The appliance shall incorporate a fire pump of 1800 L/min capacity, a water tank of 1800 ltr capacity, a foam tank of 500 ltr capacity, connected equipment for foam production and supplementary extinguishing agent as specified in Section IIA.

a) Gross vehicle weight. — Not less than 11000 Kg including crew, water and equipment.

b) Maximum speed on level road fully laden. — 72 Km / h.

c) Acceleration from a standing start through the gears, fully laden. — 64 Km/h in 55 seconds

d) The appliance shall be capable of being started from rest on a gradient of 1 in 4

e) When travelling at 48 km / h on a level dry surface the foot brake shall be capable of stopping the vehicle within a distance of 15 m 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 4500 mm
Turning circle	not more than 20 m
Road clearance	not less than 260 mm
Overall width	not more than 2.50 m

3.5.0 The monitor shall employ the self-aspiration type of foam production system where aeration is done at the branch pipe. The expansion ratio of the foam produced shall not be less than eight times with the use of foam compound as prescribed in IS: 4989 (latest edition).

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

3.7.0 A hose reel service shall be provided on the appliance. In addition to water carried on it, it shall also be possible to use water from a hydrant/ a static supply.

3.8.0 The supplementary agent used for firefighting shall be dry chemical powder (2x75 Kg capacity).

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

3.10.0 Lever type valve controls shall be preferred throughout.

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

3.12.0 Lubricating nipples shall be provided wherever necessary.

3.13.0 For detail design and construction of individual components of the foam tender including the list of additional accessories to be provided with the foam tender, refer Section IIA of this specification.

FIRE WATER TENDER

3.14.0 VEHICLE CHASSIS

The chassis for carrying out fabrication work of fire water tender shall be of Make-TATA Chassis model no. 1613, with BS- IV engine, power steering, engine exhaust brake and COWL/Ashok Leyland Comet 1616 truck chassis/ equivalent chassis of Eicher/any equivalent chassis.

Note: - The chassis shall be of BS-IV compliant as per prevailing emission norms and shall totally comply with the Central Motor Vehicle Rules/ Ministry of Road Transport & Highways notification etc., for the Yelahanka Plant where the vehicle is intended to be used.

3.15.0 The appliance shall incorporate a high and low pressure fire pump of **min. 2000** lpm capacity at 0.7 MPa and 300 lpm capacity at 3.5 MPa respectively. The appliance shall carry a water tank of min 4500ltr capacity. It shall carry an extension ladder and shall be capable of towing a trailer pump.

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

a) Gross vehicle weight not less than **16000 kg including crew**, water and equipment

b) Maximum speed on level road fully laden 72 km/h

c) Acceleration from a standing start through the gears (fully laden) 64 km/h in 55 second

d) The appliance shall be capable of being started from rest on a gradient of 1 to 4.

e) When travelling at 48 km/h on a level dry surface the foot brake shall be capable of stopping the vehicle within a distance of 15 m 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 4500 mm
Turning circle:	Not more than 20 m
Road clearance:	Not less than 23 cm
Overall width:	Not more than 2.50 m

3.17.0 All parts, which shall form waterways 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.

3.18.0 Lubricating nipples shall be provided wherever necessary.

3.19.0 For detail design and construction of individual components of the foam tender including the list of additional accessories to be provided with the foam tender, refer Section IIA of this specification.

SECTION – II

STANDARD TECHNICAL REQUIREMENTS

A DESCRIPTION OF FOAM TENDER

The design, material of construction, workmanship & finish, performance testing, accessories and equipments of fire water tender and foam tender specified herein shall comply with the requirements of codes/standard as follows:

IS: 10460 - Functional requirements for small foam tender for fire brigade use.

1.0.0 DESIGN AND CONSTRUCTION

1.1.0 Engine

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

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

1.1.3 The oil in the oil sump shall be prevented from overheating

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

1.1.5 External filter shall be provided for the lubricating system and a tubular dip-stick to gauge the level of oil in the oil pump shall be provided.

1.2.0 Electrical System

1.2.1 A sealed maintenance free battery of adequate capacity with 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.

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

1.3.0 Water Tank

1.3.1 A water tank of not less than 2000 litres capacity shall be mounted on the chassis. It shall be fabricated out of mild steel sheet of minimum 3.0 mm thickness. Bottom sheet shall be minimum 5 mm thick. The tank shall be treated for anti-corrosion with epoxy paint consisting of one coat of primer and two coats of finish paint after clean blasting of inside surface and shall be suitably baffled to prevent surge when the vehicle is braking, accelerating or concerning. The baffle shall be arranged in a manner to facilitate the passage of a man throughout the tank for cleaning purposes. Minimum thickness of baffle plate shall be 3.0 mm. It shall be mounted on the chassis in a manner keeping in view the proper load distribution on the axles and shall be so designed as to bring the

centre of gravity as low as possible in the chassis. It shall be rectangular in shape and the mounting of the tank shall be flexible type to prevent the tank's distortion due to the chassis flexion. The mounting shall permit full contents of the tank to flow into the pump. The tank with its fitments shall withstand hydrostatic pressure of 0.3 bar.

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

1.3.3 The tank shall be fitted with two filling orifices, a drain cock, a manhole and a cleaning hole (at the bottom of the tank). The filling orifice shall be of not less than 250 mm diameter and shall be fitted with a manhole cover of 450 mm dia. minimum and a filler cap clearly marked 'water' preferably cast in metal. In addition, a 63 mm instantaneous hydrant connection, incorporating a strainer, shall be provided close to the pump pane control for filling the tank through 75 mm diameter pipe or feeding the hose reel equipment. A 100 mm dia. pipe line shall be taken from the tank to the suction inlet of the pump incorporating a 100 mm quick action spherical type valve. Separate valve (s) for performing different functions shall be provided to control the flow of water. Manhole shall be located at the top of the tank.

Drain plugs or cocks shall be provided wherever necessary. Cleaning hole of not less than 250 mm diameter shall be provided at the bottom of the tank and it shall be fitted with bolted cover.

1.3.4 The tank shall be fitted with a 100 mm diameter overflow pipe. The discharge ends of the overflow pipe shall be taken down to a point well below the chassis without reducing the effective ground clearance when fully loaded and shall discharge away from the wheels.

1.3.5 Dial gauge water level indicator for the tank shall be provided preferably in the driver's cab or a visual level gauge of the glass tube shall be provided at the control panel calibrated ¼, ½, ¾ and ft. (preferably calibrated in litres).

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

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

1.4.0 Hose Reel

1.4.1 One hose reel conforming to IS: 884 shall be provided at the rear of the appliance with 60 m length of 20 mm bore hose connected by screw 'C' type quick couplings and terminating with a control branch and 5 mm nozzle. The reel shall be fitted with over brake or locking device. Nozzle shall be dual purpose shut off type.

1.5.0 Pump

1.5.1 The pump shall preferably be made of any suitable alloy, compatible with all types of synthetic protein foam compound, with stainless steel shaft suitable for use with brackish water. The pumps be capable of delivering not less than 1800 l/min. of water at a pressure not less than 8.5 kg/cm2. The pump shall preferably be of the single stage type. The pump shaft shall preferably be designed

with two deep-groove ball bearings lubricated by oil both to ensure long trouble-free service. A mechanical seal shall be provided which shall be capable of running dry for long periods without damage.

1.5.2 PUMP TEST

1.5.2.1 The pump shall run for a period of 4 hours non-stop delivering the rated output at 7 kg/cm2 with the lift of 3 m. During the test the water shall not be replenished for the cooling system as the temperature of the engine oil should not exceed 150 deg. C at highest ambient or the engine manufacturers rated temperature for continuous working whichever is less. The engine should show no sign of stress during the stress. The temperature of the cooling water (radiator water) shall not exceed 85 deg.C. The PTO sump oil temperature shall not exceed the manufacturers recommended temperature for the grade of oil used. The pump casing and impeller shall be subjected to a hydraulic pressure of 21 kgf/cm2 to detect leakages, performance, etc.

1.5.2.2 The pump shall be preferably rear mounted. The pump control panel shall be located on the rear of the appliance.

1.5.2.3 The suction inlet and delivery outlets of the pump shall, as far as possible, be fitted on or near the pump control panel.

1.5.2.4 A removable strainer and blank cap shall be provided for the suction inlets(s) for the pump.

1.5.2.5 The suction inlet shall be fitted with a standard round thread connection of 100 mm size conforming to IS: 902.

1.5.2.6 The delivery outlets of the pumps shall terminate in 63 mm female instantaneous coupling incorporating a blank cap and means for relieving pressure between the valve and the cap. The 63 mm female instantaneous coupling shall be in accordance with IS: 903-1988.

1.6.0 Primer

1.6.1 The primer may be semi-automatic in action and it shall dis-engage automatically as soon as the pump is primed. It shall be integral with the pump. It shall be capable of lifting water at least through 7.0 m at a rate of not less than 30 cm per second.

1.7.0 Power take off

1.7.1 The gear ratio shall be suitable for continuous operation of engine at stationary condition.

1.8.0 Foam Equipment

1.8.1 Foam compound tank of 500 ltr capacity shall be mounted on the chassis in addition to the water tank and as a separate & distinct unit that can be removed separately for replacement.

1.8.1.1 The foam compound tank shall be of rigid type, and shall preferably be of stainless steel welded construction.

1.8.1.2 The tank shall have a filling orifice not less than 150 mm diameter with a removable strainer fitted to it. The strainer shall be of such material so that it shall not be affected by constant contact with foam compound and its total screening area shall be adequate to permit quick filling of foam compound into the tank. The filler cap shall be clearly marked 'FOAM' preferably by pressing, casting or embossing.

1.8.1.3 The tank shall have its top dished tunnelling arrangement and a trough provided to enable easy filling from 20 litre drums. Suitable sharp-edged tin opener may also be provided at the foam tank so that the foam compound drum can be puncture easily for facilitating quick filling of the foam compound directly from the drums into the tank. The tank shall be suitably baffled to prevent surge while the vehicle is in motion or standing on uneven ground or brakes are applied to the moving appliance. The design of the tank shall incorporate a removable sump fitted with a drain valve. The foam compound draw off tube shall be positioned in the centre of the sump in such a manner that foreign matter or sludge shall not pass into the compound line. The draw-off tube shall be fitted with a gauge strainer of suitable material, mesh, size, and adequate staining area. The tank top shall be removable and it shall be ensured that the joint between the top and the body of the tank is leak proof.

1.8.1.4 Means shall be provided for automatic venting of the foam compound tank when the foam is being produced or the tank is being filled. This shall not be incorporated with the cap. The device employed shall be as simple as possible and shall not get clogged easily during normal use of the appliance.

1.8.1.5 The draw-off tube shall be connected to the foam compound proportionator / inductor and pump as necessary, and automatic flow control valve shall be incorporated in it so as to maintain a constant induction rate of not more than 6 percent with varying foam output. The plumbing for this purpose shall have a clear and unobstructed passage of not less than 50 mm throughout and shall:

a) be as short as possible;

b) be capable of being easily dismantled for internal cleaning;

c) be provided with means of thorough flushing after use;

d) not form 'U' bend or abrupt angle at any portion and be capable of being drained easily without dismantling.

1.8.1.6 A suitable transfer pump shall be provided for transferring foam compound from drums to the foam compound tank without causing any frothing in the tank. Necessary connection shall also be provided for transferring the foam compound through this pump.

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

1.8.2 Foam compound proportionator or inductor automatic proportionating arrangement shall be provided where the induction ratio of foam compound /water solution and flow of water are automatically varied as desired merely by opening and closing the monitor or hand lines. This shall be achieved

without any complex system of linkage that may be susceptible to distortion due to chassis flexion. The system shall be reliable and shall not require frequent calibration checks.

1.8.3 Foam Monitor

1.8.3.1 Foam monitor shall be mounted on the top of the appliance in such a manner that it can be manually operated by a member of the crew. The monitor shall be capable of traversing through 360 deg. In a horizontal plane, elevating from horizontal to 45 deg and depressing from horizontal to not less than 15 deg and fully rotating in both directions.

1.8.3.2 The aggregate foam discharge shall be not less than 7000 L/min. through monitor.

1.8.3.3 The monitor shall be capable of projecting the foam discharge to an effective distance of not less than 35 m in still air when operated at the designed pressure in a straight jet pattern without dripping.

1.9.0 Control panels

1.9.1 One (1) No. adequately illuminated control panel shall be provided and shall be positioned at the rear of the appliance.

1.9.2 The control panel shall include the following:

a) Throttle control for engine;

b) Pressure gauge 0 to 2.0 N/mm2 (20 Kgf/cm2)

c) Compound gauge calibrated as under;

(i) Vacuum - 0 to 75 cm Hg preferably in black

(ii) Pressure - 0 to 0.6 N/mm2 (6 kgf / cm2); preferably in black

d) Primer control (if the primer is not fully automatic);

e) Gauge for cooling water and glow lamp for lubricating system;

f) Cooling water circuit control.

g) Control for using monitor.

1.9.3 The following shall also be provided at a convenient position near the control panel(s);

a) Control for using monitor;

b) Water level indicator;

c) Hydrant connections;

d) Control for using auxiliary foam compound pic up tube;

e) Control(s) for flushing out the foam making equipment and its plumbing;

1.10.0 Body Work and Stowage

1.10.1 Enclosed accommodation for six persons (1+1 at front, 1full seat at the rear which will accommodate 4 people) shall be provided in the driver cab-crew compartment including the driver and the in-charge of the crew. Two doors on each side shall be provided on the driver cab-cum-crew compartment. The doors shall be hinged opening outwards and shall be hung forward and shall have catch locks and flush type handles.

1.10.2 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 sufficient strength shall be used for the superstructure.

1.10.3 Two nos. of lockers on each side shall be provided for secure stowage of all equipment as detailed enclosed in Annexure-I. The height of the lockers from the bottom to the top of the opening shall be not less than 600 mm and the depth not less than 600 mm.

1.10.4 All lockers shall be provided with internal automatic lighting arrangement with the master switch in the cab. The doors of the side lockers shall not be hinged at the bottom.

1.10.5 Hose tunnels shall be provided to carry four 2.5 m lengths of suction hoses in convenient location. The tunnels shall be sloped in such a way so that these allow the water or contents left in the hose after use to flow out.

1.10.6 Ladder Gallows – Gallows shall be provided to carry a 10.5 m extension ladder at a suitable position in a manner that does not provide any obstruction to the working of monitor. The design shall be such that the ladder can 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.

1.10.7 Tool Kit Container – A specially fitted recessed tray for the normal kit of tools, carried on the appliance shall be provided.

1.10.8 Stability – The stability of the appliance shall be such that when under fully equipped and loaded conditions (but excluding crew), if the surface on which the appliance stands is titled to either side, the point at which overturning occurs, is not passed at an angle of 30 degrees from the horizontal.

2.0.0 WORKMANSHIP AND FINISH

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

2.2.0 The appliance shall be pained in fire red colour conforming to Shade No. 536 of IS: 5.The paint shall conform to IS: 2932-1974.

3.0.0 ACCESSORIES

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

a) Fire bell - A 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 the hand-operated type.

b) Hand Lamps - Two

c) Fog lamps - Two

d) Reversing Light - Lamp suitably situated to assist reversing.

e) Amber blinker lights - Situated on the head of the driving compartment.

f) Trafficators - Illuminated with indicating lights on instrument panel or in any other prominent position in driving compartment.

g) Wind screen wipers electrically operated.

h) Tools - All tools required for normal maintenance of the appliance that 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 near 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) Wind screen-washer-Fitted in a suitable location with controls in driving compartment.

p) Cab, Instrument panel and locker, light.

q) Public address system.

r) VHF Radio Telephone set Bracket. A self-contained VHF transmitting/receiving set for communication.

4.0.0 MARKING

4.1.0 The appliance shall be clearly and permanently marked with the following information:

a) Manufacturer's name, or trademark, if any.

b) Capacity of the pump in litres/minute, capacity of the water tank and foam tank in litres;

c) Year of manufacturer

5.0.0 ADDITIONAL ACCESSORIES (over and above accessories mentioned against Cl 3.0.0)

The additional accessories that are normally required to assist in operation of appliance are detailed in enclosed Annexure I to this specification. Bidder to include these accessories in their scope of supply.

6.0.0 SUPPLEMENTARY EXTINGUISHING AGENT

6.1.0 The supplementary extinguishing agent shall be dry chemical powder.

6.2.0 The total quantity of supplementary agent shall be not less than 150 kg. Of dry powder and shall conform to IS: 4308.

6.3.0 The dry powder system shall comply with the following minimum requirement.

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

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

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

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

7.0.0 ACCEPTANCE TESTS

The following acceptance tests on various equipment shall be conducted to meet guaranteed parameters and shall be carried out in accordance with relevant IS Code.

a) Pump test
b) Primer test
c) Road test
d) Stability

B DESCRIPTION OF FIRE WATER TENDER

The design, material of construction, workmanship & finish, performance testing, accessories and equipments of fire water tender and foam tender specified herein shall comply with the requirements of codes/standard as follows:

Latest IS: 950 Type-B - Functional requirements for fire water tender, Type-B for fire brigade use.

8.0.0 DESIGN AND CONSTRUCTION

8.1.0 Engine

8.1.1 The engine shall be provided with cooling system to permit its continuous stationery running without overheating. Indirect cooling system shall be incorporated, if necessary, which shall be of the open circuit type discharging water to the waste. Arrangements shall be made to divert the cooling discharge water to water tank, if necessary.

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

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

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

8.1.5 External filter shall be provided for the lubricating system and a tubular dip-stick to gauge the level of oil in the oil sump shall be provided.

8.1.6 The heat exchanger tank shall be made from minimum1.22 mm thick mass sheet and the coil in the coolant tank shall be of copper for effective cooling. The design of the heat exchanger shall be such that the temperature of the engine shall not exceed for the operating temperature specified by the chassis manufacturer when the vehicle is being tested in stationary conditions.

8.2.0 Electrical System

8.2.1 A trickle type battery charge 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.

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

8.3.0 **Water Tank** - It shall have minimum capacity of 4500 litres as per latest IS-950.

8.3.1 A single tank shall be used with a capacity of 4500 liters. The tank body and baffles shall be of minimum 5 mm thick mild steel plates. The tank shall be mounted on the chassis and suitably baffled in a manner keeping in view the proper load distribution on the axles. The baffling provided in the

tank shall be able 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 purpose. The tank shall be mounted on minimum three cross members to counter act the stresses caused by chassis flexion and shall be so secured that it can be easily removed. The tank shall be mounted on the vehicles using metacone mounting. U-bolts shall not be used in the vehicle. Suitable eyes shall be provided on the shell of the tank to enable it to be lifted from the vehicle for repairs/ replacement as and when required.

8.3.2 The tank shall be fitted with a 50 mm bore overflow pipe. A 63 mm instantaneous hydrant connection, incorporating a strainer, shall be provided close to the pump panel control for filling the tank through 75 mm bore pipe work or feeding the hose reel equipment. Minimum 100 mm bore pipe line shall be taken from the tank to the suction inlet of the pump incorporating minimum 100 mm quick action spherical type valve. Separate valve(s) for performing the function given in 14.3.6 shall be provided to control the flow of water to the hose reel equipment. Drain plugs or drain cocks shall be provided, wherever necessary.

8.3.3 The tank shall be given adequate anti-corrosive epoxy treatment consisting of one coat of primer with two coats of finish paint after preparing the surface by sand blasting from inside and outside after fabrication if it is not galvanized. The open end of the overflow pipe should be taken down to a point well below the chassis without affecting the effective ground clearance when fully loaded and shall discharge away from the wheels.

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

8.3.5 The tank shall have a bolted manhole of 450 mm diameter minimum and shall have a threaded ring and cap of 300 mm diameter for filling the water tank from the top. The manhole cover shall be made from 5 mm thick mild steel plate and epoxy coated from inside and outside. A cleaning hole of at least 250 mm diameter shall also be provided at the bottom.

8.3.6 The tank shall be connected with the pump and hose reel and valve (s) shall be provided in such a way that any of the following operation are possible

a) Hydrant - tank,

b) Hydrant - reel,

c) Tank-pump-high and low pressure hose reel,

d) Hydrant- pump- high and low pressure hose reel, and

e) Tank-Pump-Monitor

f) Off.

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

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

8.4.0 Hose Reel

8.4.1 Two nos. hose reel (conforming to IS: 884) shall be provided at the rear of the appliance with 60 m lengths of 20 mm bore hose connected by screw 'C' type quick release couplings and terminating with a control branch and fog nozzle. The reel shall be fitted with over brake or locking device. The gun shall be of constant flow type and shall have a discharge capacity of 150 litre/min approximately. Provision shall be made in the gun controls to achieve combat mode (straight jet) or a fog shield in split second. The fog gun shall be made of stainless steel or aluminum alloy.

8.5.0 Pump

8.5.1 A centrifugal pump high and low pressure pump shall be mounted at rear side of the appliance. The low and high pressure sections of the pump may be either single-stage or multi stage type. Anti-friction bearings external to the casing be provided so as to avoid any bearings within the pump casing. The bearing used in the pump shall be of reputed make. The gland shall be of the mechanical self-adjusting type. The pump shall be provided with in-built filter assembly of easily removable type, which shall filter the water before entering into pressure stage impeller. A filter capable of filtering particle size up to 0.75 mm or less shall be used. This filter shall be of stainless steel and shall be easily accessible for cleaning.

The normal and high pressure impeller shall be mounted on a single shaft. The impeller(s) of the low pressure section shall be closed type and shall be dynamically balanced. The impeller(s) of the high pressure section shall be closed or regenerative type. A drain cock plug shall be provided at the bottom of the casing in a way to prevent the cock being opened due to vibrations. Studs, bolts etc., used in the pump casing coming in contact with the water shall be of stainless steel. The castings shall be without any blow holes, internal cracks, etc. The interior of the casting shall be smooth finished. The castings shall withstand the hydraulic pressure as specified against Cl. No. 14.5.5.

The bearing housing will be made of C.I. the delivery outlet, delivery valves and high pressure circuitry shall be made of Gun metal conforming to Gr.II of IS: 318.

The pump shall be provided inbuilt (integrated in the pump outlet manifold) pressure relief valve which shall operate automatically and shall not allow the high pressure to increase beyond 45 Kg/cm2.

8.5.2 The pump shall be completely covered. However, all the controls on the panel and the gauges shall be uncovered.

The pump shall be coupled to the prime-mover of the chassis through a power take-off (PTO) capable of transmitting full torque of the engine used for the appliance. All propeller shafts and all fittings used for coupling the PTO, pump, etc., shall be of the same size and type as used by the chassis manufacturer for the drive line.

The PTO shall have a step up gear ratio of not less than 1:1.27. A cooling coil made of copper pipe shall be provided in the bottom of the PTO casing.

A control lever for engaging and disengaging the pump, with suitable locking devices, shall be provided in the driver's cab.

8.5.3 The pump shall be designed to give its rated output with an engine and pump input at shaft speed safe enough to operate the engine. The pump shall give performance as detailed below when working with strainers (except basket strainer) at 27±2 ^{0}C.:

The pump shall be capable of delivering 2000 LPM @ 7 Kg/cm^2 and 300 LPM @ 35 Kg/cm^2 at 3 mtrs. Suction lift at NTP condition.

The pump shall follow the following performance parameters:

Normal Pressure Output	: 2000 LPM @ 7 Kg/cm^2
High pressure Output	: 300 LPM @ 35 Kg/cm^2
Maximum Pressure in Normal Pressure mode	: 14 Kg/cm^2 (shut off pressure)
Maximum Pressure in High Pressure mode	: 45 Kg/cm^2
Deep Lifting Capacity of Pump	: 30 m3/sec max. up to 7 M in 30 Sec. at NTP conditions

The above performance data shall be considered when working through 2.45 m lengths of specified suction hose.

The design of pump shall be such that the normal pressure and high pressure stages can be operated simultaneously. Simple mechanism shall be provided to change over from normal pressure to high pressure, preferably a single lever operation. However at any given pump/engine speed, the low pressure registered shall not exceed 1/4th (one quarter) of the registered high pressure.

The pump housing shall have provision to connect normal pressure hose reel and cooling water line.

The efficiency of the pump shall be such that the power and the RPM required shall not be more than that available with the engine.

8.5.4 The material of construction for pump & its control panel shall be as follows:

a)	Pump casing and low pressure impeller	Lead tin bronze (Grade LTB2 of IS: 318)
b)	High pressure impeller	Phosphorous-bronze or stainless steel or aluminum bronze (IS 617)

c)	Impeller ring and impeller neck ring	Lead tin bronze (Grade LTB2 of IS: 318)
d)	Pump shaft	Stainless steel (Grade 04Cr18Ni10 of IS: 6603).
e)	Pump panel	Aluminum sheets/ chequered plates (IS 737) or mild steel sheets (IS: 513 ordinary grade)

8.5.5 Pump Test

When tested in accordance with pump specification, the efficiency shall not deviate from the value specified by the pump manufacturer by more than ± 5%. However, in no case the efficiency of the pump shall be less than 60 percent. The pump shall run for a period of 3 hours non-stop delivering the rated output at 0.7MPa and for 1 hour at 3.5 MPa with a lift of 3 m.

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

During the test the water shall not be replenished for the cooling system and the temperature of the engine oil should not exceed 115°C or of the engine manufacturer 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) tank shall not exceed 85 °C. The PTO sump oil temperature shall not exceed 100 percent of the manufacturers recommended temperature for the grade of oil used. The pump casing and impeller shall be subjected to a hydraulic pressure of 2.1 MPa to detect leakage, perforation, etc. Foam induction test shall be done to check calibration of the metering valve.

8.6.0 Suction inlet and Delivery Valves

8.6.1 The pump shall have suction inlet(s) having 125 mm standard suction connection as per IS: 902 with internal strainer(s) and blank cap(s). The strainer(s) shall be retained firmly when in use but shall be easily removable. The mesh size of the pump inlet screen shall be smaller than the outlet size of the impeller.

8.6.2 The pump shall be provided with 2 delivery valves for the 2000 litres/min pump having 63 mm standard hose couplings as per IS: 903 with screwed wheel type quick closing clack valve conforming to IS: 4928. Blank caps fastened with chains and incorporating means to relieve pressure between the valve and the cap shall be provided one for each delivery valve.

8.7.0 Primer

8.7.1 The primer shall be capable of lifting water at least 7.0 m (measured form water level to the center of pump) in not more than 24 seconds and shall preferably be fully automatic. The allowance shall be 30 cm for every 300 m elevation above sea level and 1 percent for 2.5°c rise in water temperature.

8.7.2 If case of the reciprocating type primer, means shall be provided to automatically limit the speed of engine while the primer is engaged.

8.7.3 The primer shall be constructed of gun metal/light alloy casting, shall have stainless steel shaft and shall be fitted with suitable lubricated bearing depending upon the type of primer. The caps of primer and springs shall be properly secured. The primer lever shall be easily accessible from the operator(s) position.

8.7.4 In the case of reciprocating type, the primer shall be preferably designed with a view to primer when the pump is running at speed of 1000 to 1500 rpm. The primer shall disengage automatically at pump pressure of 1.5 to 2.0 bars without manual intervention.

8.8.0 Water/Foam Monitor

One water-cum-foam monitor shall be provided on the top at suitable location. The monitor shall confirm to IS 8442.

8.9.0 Control Panels

8.9.1 Adequately illuminated control panel shall be provided and positioned as follows:

a) Rear mounted pump - One control panel at the rear of the appliance.

8.9.2 The control panel(s) shall include the following:

a) Throttle control for engine;

b) Pressure gauge -0 to 2 MPa
Pressure gauge – 0 to 5 MPa

c) Compound gauge calibrated as under:
Vacuum - 0 to 75 cm Hg, preferably in black;
Pressure - 0 to 0.6 MPa preferably in black;

d) Primer control (if the primer is not fully automatic)

e) Gauge for cooling water and glow lamp for lubricating system;

f) Cooling water circuit control.

g) Control for using monitor.

8.9.3 The following shall also be provided at a convenient position near the control panel(s):

a) Water level indicator as described under cl.no. 8.3.4

b) Five way control valve as described under cl.no. 8.3.6

c) Hydrant connections.

8.10.0 Body Work and Stowage

8.10.1 Enclosed accommodation for six persons shall be provided in the driver cab-cum-crew compartment including the driver and the in charge of the crew. Two doors in each side shall be provided on the driver cab-cum-crew compartment. The doors shall be hinged opening outwards and shall be hung forward and shall have catch locks and flush type handles.

8.10.2 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 sufficient strength shall be used for the superstructure.

8.10.3 Lockers shall be provided for secure stowage of all equipment as detailed enclosed in Annexure-II except aluminium extension ladder and fire hook. The height of the lockers from the bottom to the top of the opening shall be not less than 600 mm and the depth not less than 600 mm. One locker shall be reserved for the storage of batteries. The extra length of battery cable shall be considered by the bidder, if required. The mechanism shall have locking and unlocking facility to ensure proper fixing of battery sets in place.

8.10.4 All lockers shall be provided with internal automatic lighting arrangement with the master switch in the cab. The doors of the lockers shall have efficient means for holding them closed by efficient flush fitting spring loaded locks. The doors of the side lockers with the exception low lockers shall not be hinged at the bottom; doors of the low lockers hinged at the bottom shall have not less than 5 cm ground clearance.

8.10.5 Hose tunnels shall be provided to carry four 2.5 m lengths of suction hoses on convenient location. Drain holes shall be provided preferably at the bottom of the tunnel and hose stowage compartment. Hose racks and suitable provision shall be provided in the locker for holding hose fitting.

8.10.6 Ladder Gallows - Gallows shall be provided to carry a 10.5-m, aluminium extension ladder. 1 nos. 10.5M Al. ladder shall also to be provided. The design shall be such that the ladder can 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.

8.10.7 Cable Winch - An electrically operated cable winch of 6 t capacity shall be provided. The winch unit shall be complete with minimum 5.5 HP 12 V dc series wound electric reversible motor for increased pulling power, rope drum, and 27 m heavy duty galvanized EIPS wire rope with replaceable self-locking clevis hook and shall be mounted on the front bumper of the vehicle with suitable strong supports.

8.10.8 Telescopic Light Mast or Inflatable Emergency Lighting System- A compact, low profile, roof mounted lighting system, fitted with 4 × 1 000 W metal halide lamps, vertically elevated pneumatically up to 4.6 m shall be installed on the roof of the vehicle. Lighting shall be provided by a 12 V or 24 V dc with remote control, directional lighting system with rotation and tilt lamps to provide total coverage. The remote control unit shall allow a person to operate all the functions of the light mast or inflatable emergency lighting system and accurately aim for complete directional positioning. In addition auto show, a one button command, automatically retracts, turns out the lights and stows the entire system to the compact transport position shall also be included in the remote controller. The complete unit shall comprise of hand held remote control with cable, rotation and tilt positioner, mounting frame with built-in tilt system.

8.10.9 Alternator Unit - A 6.5 kVA capacity portable diesel engine driven generator unit shall be mounted at suitable location with all necessary connections and control panel for providing power to the light mast as well as other electrically operated tools.

8.10.10 Tool-Kit Container- A specially fitted recessed tray for the normal kit of tools, carried on the appliance, and shall be provided.

8.10.11 Stability- The stability of the appliance shall be such that when under fully equipped and loaded conditions (but excluding crew), 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 degrees from the horizontal.

8.10.12 Wireless set Box- Box made from 2 mm gauge aluminium sheet with lid shall be provided just behind the officer seat with 13mm wooden plank for fitting the wireless set bracket. The design and mounting shall be shown at the time of fabrication work.

9.0.0 WORKMANSHIP AND FINISH

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

9.2.0 The appliance shall be painted fire red color conforming to Shade No. 536 of IS:5. The paint shall conform to IS: 2932

10.0.0 ACCESSORIES

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

a) Instruction book containing general instructions, installation/ assembly details, maintenance and servicing instructions

b) Fire bells - 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.

c) Head lamps - Two.

d) Fog lamps - Two.

e) Reversing light - Lamp suitably situated to assist reversing.

f) Amber blinkers lights - Situated on the head of the driving compartment.

g) Trafficators - Illuminated with indicating lights on instrument panel or in any other prominent position in driving compartment.

h) Wind screen wipers electrically operated.

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

j) Siren - Battery operated.

k) 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 mm of TRS cable on a reel mounted on the appliance.

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

m) 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.

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

o) Rear reflectors

p) Wind Screen Washer

q) Cab, instrument panel and locker, light

r) Public address system.

s) VHF Radio Telephone set Bracket. A self-contained VHF transmitting/receiving set for communication.

11.0.0 INSTRUCTION BOOK, ACCESSORIES AND EQUIPMENT

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

12.0.0 MARKING

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

a) Manufacturer's name, or trademark, if any;

b) Capacity of the pump in liters/minute, and of the water tank in liters; and

c) Year of manufacture.

13.0.0 ADDITIONAL ACCESSORIES (over & above accessories mentioned against Cl.10.0.0)

The additional accessories that are normally required to assist in operation of appliance are detailed in enclosed Annexure-II (of this specification). Bidder to include these accessories in their scope of supply.

13.1.0 ACCEPTANCE TESTS

The following acceptance tests on various equipment shall be conducted to meet guaranteed parameters and shall be carried out in accordance with relevant I S Code.

a) Pump test
b) Primer test
c) Road test
d) Stability

ANNEXURE-I

Schedule of equipments to be supplied with foam tender.

S.No.	Equipment / Item	Quantity
1.0	Aluminum Extension ladder-10.5 meter (IS: 4571 or IS: 930)	1
2.0	Armoured suction hose 100 mm dia complete with round thread with couplings 2.5 m long (IS: 3549 and IS: 902)	4 lengths
3.0	Delivery hose, 63 mm, rubber lined in 30 m lengths (type II of IS: 636) complete with instantaneous couplings (IS: 903)	10 lengths
4.0	Suction strainers for item 2.0 (IS: 907)	1
5.0	Basket strainers for item 2.0 (IS: 3582)	1
6.0	Dividing breaching made of light alloy (IS: 5131)	2
7.0	Collecting breaching made out of light alloy (IS: 905)	2
8.0	Suction wrenches (IS: 4643)	1 pair
9.0	Long lines, 50 mm circumference, 30 m long (IS: 1084)	2 lengths
10.0	Short lines, 50 mm circumference, 15 m long (IS: 1084)	2 lengths
11.0	Hose, bandages, rubberised (IS: 5612)	12
12.0	Hose clamps (IS: 5612)	6
13.0	Hydrant valve key and bar (IS: 910)	1 set
14.0	Protective clothing for fire men complete with gloves, boots, helmets with suitable face shield made out of material capable of reflecting at least 95% of radiant heat temperature around 1500 to 2000 degree C and afford some protection against direct flame. The suit will be of sufficient size to accommodate a breathing apparatus to users.	2 Set
15.0	Fog nozzle (IS: 952) with extension applicator to fog head.	1
16.0	Hand controlled branch for 63 mm size hose coupling.	1
17.0	Branch pipe universal (IS: 2871)	2 nos.
18.0	Branch with revolving head (IS: 906)	1
19.0	Branch pipes (IS: 903)	4
20.0	Nozzle of size 12 mm, 16 mm, 20 mm and 32 mm (two each) (IS: 903) Adaptor for 100 mm suction female screw coupling and 63 mm male instantaneous. Adaptor double female instantaneous pattern 63 mm. Adaptor double male instantaneous pattern 63 mm.	10 2 2 2
21.0	Nozzle spanners (IS: 903)	2
22.0	Portable electric box lamp with rechargeable accumulator.	2
23.0	Hand lamp (torch-4 cells)	2
24.0	Flameproof lamp (usable in the present of inflammable gases of vapours)	2
25.0	Self-contained breathing apparatus (compressed air type) complete with spare cylinder and tool kit.	1 Set
26.0	First aid box for 10 persons.	1
27.0	Insulated plier (IS : 3650) with rubber gloves (IS: 4770)pair	2 Nos.

	tested to 20000 Volts	
28.0	Asbestos gauntlets (in case)	1 pair
29.0	Axe, large (IS: 703)	1
30.0	Spade	1
31.0	Pick axe (IS: 273)	1
32.0	Crow bar (IS: 704)	1
33.0	Sledge hammer, 6.5 kg (IS: 841)	1
34.0	Carpenter's saw, 60 cm (IS; 5098)	1
35.0	Hydraulic jack-7.5 tonne.	1
36.0	Fire hook (IS: 927)	1
37.0	Tool kit	1
38.0	VHF radio telephone set	2 nos.
39.0	Lifting and pulling machine, 3 tonnes (see IS:5604-1984)	1 No.
40.0	Motorized barrel transfer pump	1 set
41.0	Hydraulic rescue tools	1 set
42.0	Blanker smothering	1 No.
43.0	Quick release knife (see IS:5486)	5 Nos
44.0	9 kg. capacity suitable for fighting metal fires in charged condition with applicator (see IS : 11833)	2 Nos.
45.0	Copper bolt (IS : 5200)	1 No.
46.0	Fireman's axe with belt firemen and pauches firemen (IS : 926)	5 nos.
47.0	Hacksaw 300 mm adjustable with 5 spare blades each (IS : 5169)	2 Nos.

ANNEXURE-II

List of equipments to be supplied with the fire water tender

S.No.	Equipment / Item	Quantity
1.0	Aluminium Extension ladder –10.5 m (IS 4571)	01
2.0	a) Rubber lined delivery hose according to Type-II of IS: 636 in 30 m or 15 m length fitted with 63 mm delivery hose couplings (IS: 903)	180 m
	b) Unlined flax canvas hose according to IS 4927 in 30m lengths fitted with delivery hose coupling (as per IS 903)	150 m
	c) Controlled percolating hose as per IS8423 in 30 m lengths fitted with delivery hose couplings (as per IS 903)	150 m
3.0	a) Hose clamps (IS: 5612, part-1) b) Hose bandages (IS: 5612, part-II) c) Hose slings d) Hose straps	25 25 20 20
4.0	Suction hose of rubber of 100 mm internal Diameter in 2.5 m length (IS: 2410) fitted with 100 mm suction hose couplings (as per IS 902).	10 m
5.0	3 way suction collecting head 100 mm size (IS: 904)	01
6.0	Suction wrenches for 100mm suction coupling (IS: 4643)	02
7.0	Suction Strainer 100 mm size (IS: 907)	01
8.0	Basket strainer, cylindrical type (IS: 3582)	01
9.0	Dividing breeching with control instantaneous Pattern 63 mm (IS 5131)	1
10.0	Collecting breaching with control instantaneous Pattern 63 mm (IS 905)	01
11.0	a) Hydrant-stand pipe-two way (IS: 5714) b) Double female coupling (IS: 901) c) Hydrant connection, 63mm female instantaneous pattern delivery coupling at both end. (IS: 901)	01 02 02
12.0	Combined key for hydrant, hydrant cover and lower valve (IS 910)	02
13.0	Fog nozzle with extension applicator with fog head (IS: 952)	01
14.0	Hand controlled branch for 63 mm size hose coupling	01
15.0	Branch pipe universal (IS: 2871)	02

16.0	Branch with revolving head (IS: 906)	01
17.0	Branch pipe (IS 903)	4
18.0	Nozzles of sizes 12 mm, 16 mm, 20 mm and 32 mm (two each) (IS: 903)	10
19.0	a) Adopter for 100 mm suction female screw Coupling and 63 mm male instantaneous b) Adopter double female instantaneous pattern 63 mm c) Adopter double male instantaneous pattern 63 mm	02 02 02
20.0	Nozzle spanners (IS: 903)	02
21.0	Portable electric box lamp with rechargeable accumulator.	02
22.0	Hand lamp (torch – 4 cells)	02
23.0	Flame proof lamp (useable in the presence of inflammable gases and vapours.	02
24.0	Self-contained breathing apparatus (compressed air type) complete with spare cylinder and tool kit.(IS 10245 Part 2)	1 set
25.0	Portable fire extinguisher, dry powder type, 2 kg (IS: 2171)	01
26.0	Foam making branch FB-4 with pick up tube (IS 2097)	01
27.0	Lowering Line: 50 mm hmp or terylene 40 m long having two ends spliced in and one end with a running noose (IS: 1084)	01
28.0	Long line, 50mm manila, 30 m long (IS 1084)	01
29.0	Short line, 50mm manila, 15 m long (IS 1084)	01
30.0	Canvas buckets	02
31.0	First aid box for 10 persons	01
32.0	Insulated plier (IS3650) with rubber gloves pair (IS4770) tested to 20000 volts	2 nos.
33.0	Asbestos gauntlets	1 pair
34.0	Axe large (IS: 703)	01
35.0	Spade	01
36.0	Pick Axe (IS: 273)	01
37.0	Crow Bar (IS: 704)	01
38.0	Sledge Hammer (IS: 841) –6.5 Kg	01

39.0	Carpenter saw 60 cm (IS: 5098)	01
40.0	Spanner – adjustable, 30 cm length handle (IS: 6149)	01
41.0	Door breaker	01
42.0	Hydraulic jack –7.5 tonnes	01
43.0	Fire Hook (IS 927)	1
44.0	Tool kit	01
45.0	Grease gun	02
46.0	Oil feeder	01
47.0	Can oil – 2 litres	01
48.0	Oil can – 10 litres	01
49.0	Funnel for oil or fuel filing – 250 mm	01

ANNEXURE-III

List of Maintenance Tools and Tackles to be supplied with each vehicle

Sl.NO.	ITEM	QUANTITY
1	DE spanner set 6.25 mm	1 set
2	Ring spanner set 6.25	1 set
3	Adjustable wrench 200 mm	1 No
4	Pliers cutting	1 No
5	Pliers round nose 150 mm	1 No
6	Pipe wrench 300 mm	1 No
7	Screw driver 150 mm	1 No
8	Screw driver 250 mm.	1 No
9	File half round smooth 150 mm	1 No
10	Hammer ball pen ½ kg.	1 No
11	Grease gun.	1 No
12	Oil feeder.	1 No
13	Carpenter saw 450/500	1 No

Note: The above list is bare minimum, if any other maintenance tools & tackles required as per system requirement same shall be provided to BHEL without any additional cost.

LIST OF DOCUMENTS TO BE SUBMITTED BY BIDDER DURING DETAIL ENGINEERING

S.No.	DRWG NO	DRWG TITLE	CATEGORY	SCHEDULED SUBMISSION (NO. OF WEEKS FROM LOA DATE / PO DATE) or AS SPECIFIED IN NIT, WHICHEVER EARLIER.	RESUBMISSION AFTER COMMENTS INCORPORATION
1	PE-V0-409-550-A001	T.D.S & GA INCLUDING FLOW DIAGRAM OF WATER TENDER	A-CUST	4	WITHIN 1 WEEK
2	PE-V0-XXX-550-A002	TDS & G.A INCLUDING FLOW IAGRAM OF FOAM TENDER	A-CUST	4	WITHIN 1 WEEK
6	PE-V0-XXX-550-A006	MQP FOR WATER TENDER	A-CUST	4	WITHIN 1 WEEK
7	PE-V0-XXX-550-A007	MQP FOR FOAM TENDER	A-CUST	4	WITHIN 1 WEEK
11	PE-V0-XXX-550-A011	O & M MANUAL OF FIRE AND FOAM TENDER	A-CUST	8	WITHIN 1 WEEK

Note:
Drawing / Document shall be uploaded by the successful bidder on WRENCH /DMS. Procedure for the same will be informed after award of contract.

STANDARD MANUFACTURING QUALITY PLAN FOR FIRE TENDER AND FOAM TENDER

Note: The requirements indicated in the standard quality plans are the minimum requirements. Any other requirement as required by final customer/BHEL, during detail engineering, shall be incorporated by bidder without any commercial implication to BHEL.

	MANUFACTURERS NAME & ADDRESS		MANUFACTURING QUALITY PLAN					BHEL				
			ITEM	FOAM TENDER	BHEL QAP NO. REV NO : DATE : PAGE NO : BIDDER DOC. NO.							
			SUB SYSTEM PO NO DTD									
SR.NO.	COMPONENTS & OPERATIONS	CHARACTERISTICS	CLASSIFICATION	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY			REMARKS
									P	W	V	
1.0	**MATERIAL & COMPONENTS**											
a.	M.S. Plate for Water tank	Chemical Property	Minor	Chemical Property	Lot	IS:2062	IS:2062	T.C.	-	-	1/2/3	
b.	S.S. Plate for Foam tank	Chemical Property	Major	Chemical Property	Lot	SS	SS	T.C.	-	-	1/2/3	
d.	Gun metal (pump casing)	Chemical Property	Major	Chemical Property	Lot	IS:318 Gr:2	IS:318 Gr:2	T.C.	-	-	1/2/3	
e.	Stainless Steel (Pump Shaft)	Chemical Property	Major	Chemical Property	Lot	SS 304	SS 304	T.C.	-	-	1/2/3	
f.	G.M. (Impeller)	Chemical Property	Major	Chemical Property	Lot	IS:318 Gr:2	IS:318 Gr:2	T.C.	-	-	1/2/3	
1A.	Engine & Chassis (TATA)	Make,Type	Minor	Chassis Document	Lot	Chassis Document	Chassis Document	Chassis Document	-	-	1/2/3	
2.0	**IN PROCESS INSPECTION**											
a.0	(Structural) Fabrication of water & foam Tank	Visual & Dimension incl. Thickness	Minor	Dimensional (Visual)	100%	As per G.A./WT/FT Drawing	As per G.A./WT/FT Drawing	Approved G.A./WT/FT Drawing	2	-	1/3	
b.0	Hydro test of water tank & foam tank	Hydro test of water & foam tank	Major	Hydro Test 0.3bar	100%	As per Specification.	No Leakage	I.R.	2	1/3	-	
c.0	Pump casing	Hydro test	Major	21kg/cm. Sq.	100%	at 21kg/cm. Sq.	No Leakage	I.R.	2	1/3	-	
d.0	Impeller	Dynamic Balancing	Major	-	100%	Balancing certificate	Balancing certificate	T.C.	2	-	1/3	
3.0	**COMPLETE ASSEMBLY INSPECTION**											
a.	Pump (Primer) Assembly	Visual Check	Major	Visual/Completeness	100%	As per Specification.	As per Specification.	I.R.	2	-	1/3	
b.	Hose reel Assembly	Visual Check	Minor	do-	100%	As per Specification.	As per Specification.	I.R.	2	-	1/3	
4.0	**FINAL INSPECTION OF COMPLETE FIRE TENDER**	Performance Test of Pump for 4 hour & deeplift Test of primer, Stability test, road test, tilting test,	Major	Performance Test and Verification of list of equipments and accessories as per IS:10460 and approved datasheet.	100%	Approved data sheet, approved Drawing, As per IS:10460 and P.O No. PW/PE/PG/NCH//P-356/10	Approved data sheet, approved Drawing, As per BHEL IS 10460 and P.O No. PW/PE/PG/NCH//P-356/10	I.R.	2	1/3	-	

MANUFACTURER SIGNATURE	LEGEND : ** 1 : BHEL, 2: BIDDER 3: CUSTOMER W: WITNESS P: PERFORMAR V: VERIFIER I.R. = INSPECTION REPORT T.C. = TEST CERTIFICATE	FOR BHEL USE : REVIEWED BY	NAME & SIGNATURE OF APPROVING AUTHORITY & SEAL

	MANUFACTURERS NAME & ADDRESS		MANUFACTURING QUALITY PLAN					BHEL				
			ITEM	WATER TENDER	BHEL QAP NO. REV NO : DATE :							
			SUB SYSTEM	FIRE FIGHTING VEHICLE	PAGE NO : BIDDER DOC NO). -							
SR.NO.	COMPONENTS & OPERATIONS	CHARACTERISTICS	CLASSIFICATION	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY			REMARKS
									P	W	V	
1.0	**MATERIAL & COMPONENTS**											
a.	M.S. Plate for Water tank	Chemical Property	Minor	Chemical Property	Lot	IS:2062	IS:2062	T.C.	2	-	1/2	
c.	Gun metal (pump casing)	Chemical Property	Minor	Chemical Property	Lot	IS:318 Gr:2	IS:318 Gr:2	T.C.	2	-	1/2	
d.	Stainless Steel (Pump Shaft)	Chemical Property	Major	Chemical Property	Lot	SS 304	SS 304	T.C.	2	-	1/2	
e.	G.M. (Impeller)	Chemical Property	Major	Chemical Property	Lot	IS:318 Gr:2	IS:318 Gr:2	T.C.	2	-	1/2	
1A.	Engine & Chassis (TATA)	Make,Type	Major	Chassis Document	Lot	Chassis Document	Chassis Document	Chassis Document	2	-	1/2	
2.0	**IN PROCESS INSPECTION**											
a.0	(Structural) Fabrication of water Tank	Visual & Dimension incl. Thickness	Minor	Dimensional (Visual)	100%	As per G.A./WT Drawing	As per G.A./WT Drawing	Approved G.A./WT Drawing	2	-	1	
b.0	Hydro test of water tank	Hydro test of water tank	Minor	Hydro Test 0.3bar	100%	As per Specification	No Leakage	I.R.	2	1	-	
c.0	Pump casing	Hydro test	Major	21kg/cm. Sq.	100%	21kg/cm. Sq.	No Leakage	I.R.	2	1	-	
d.0	Impeller	Dynamic Balancing	Major	-	100%	Balancing certificate	Balancing certificate	T.C.	2	-	1	
3.0	**COMPLETE ASSEMBLY INSPECTION**											
a.	Pump (Primer) Assembly	Visual Check	Major	Visual/Completeness	100%	As per Specification.	As per Specification.	I.R.	2	-	1	
b.	Hose reel Assembly	Visual Check	Minor	do-	100%	As per Specification.	As per Specification.	I.R.	2	-	1	
4.0	**FINAL INSPECTION OF COMPLETE FIRE TENDER**	Performance Test of Pump for 4 hour & deeplift Test of primer	Major	Performance Test	100%	Approved data sheet, approved Drawing	Approved data sheet, approved Drawing	I.R.	2	1	-	

MANUFACTURER SIGNATURE	LEGEND :	FOR BHEL USE :
	** 1 : BHEL/CUSTOMER, 2: BIDDER W: WITNESS P: PERFORMAR I.R. = INTERNAL REVIEW V: VERIFIER T.C. = TEST CERTIFICATE	REVIEWED BY NAME & SIGNATURE OF APPROVING AUTHORITY & SEAL

FORMAT FOR OPERATION AND MAINTENANCE MANUAL

Project name :
Project number :
Package Name :
PO reference :
Document number :
Revision number :

Sl.no. & Sections	Description	Tick (√)if included in Manual			Remarks
		Yes	No	Not Applicable	
1.	**COVER PAGE**				
1.1	Project Name				
1.2	Customer/consultant Name				
1.3	Name of Package				
1.4	Supplier details with phone, FAX ,email address , Emergency Contact number				
1.5	Name and sign of prepared by , checked by & approved by				
1.6	Revision history with approval Details				
2.0	**INDEX**				
2.1	showing the sections & related page nos All the pages should be numbered section wise				
3.0	**DESCRIPTION OF PLANT/SYSTEM**				
3.1	Description /write up of operating principle of system equipment/ associated sub-systems & accessories/controls system , operating conditions, performance parameters under normal , start up and special cases				
3.2	Equipment list and basic parameter with Tag numbers				
3.3	Data sheets approved by Customer/for information and catalogues provided by original manufacturer				
3.4	Associated other packages and Interface /terminal points				
3.5	P&ID & Process Diagrams				
3.6	GA Layout drawings, As-built drawings , Actual photograph of items/system (Drawings of A2 & bigger sizes are to be attached in the last)				
3.7	Single line/wiring diagrams				
3.8	Control philosophy /control write-ups				

Sl.no. & Sections	Description	Tick (√)if included in Manual			Remarks
		Yes	No	Not Applicable	
4.0	**COMMISSIONING ACTIVITIES (IF NOT COVERED IN SEPARATE DOCUMENT I.E. ERECTION MANUAL, COMMISSIONING MANUAL)**				
4.1	Pre-Commissioning Checks				
4.2	handling of items at site				
4.3	Storage at site				
4.4	Unpacking & Installation procedure				
5.0	**OPERATION GUIDELINES FOR PLANT PERSONAL/USER/OPERATOR**				
5. 1	Interlock & Protection logic along with the limiting values of protection settings for the equipment along with brief philosophy behind the logic, drawings etc. to be provided.				
5. 2	Start up, normal operation and shut down procedure for equipments along with the associated systems in step by step mode. Valve sequence chart, step list, interlocks etc. with Equipment isolating procedures to be mentioned.				
5. 3	Do's & Don't of the equipments.				
5. 4	Safety precautions to be taken during normal operation. Safety symbols, Emergency instructions on total power failure condition/lubrication failure/any other condition				
5. 5	Parameters to be monitored with normal values and limiting values				
5. 6	Trouble shooting with causes and remedial measures				
5. 7	Routine operational checks, recommended logs & records				
5. 8	Changeover schedule if more than one auxiliary for the same purpose is given				
5. 9	Painting requirement and schedule				
5. 10	Inspection, repair , Testing and calibration procedures				
6.0	**MAINTENANCE GUIDELINES FOR PLANT PERSONAL**				

Sl.no. & Sections	Description	Tick (√)if included in Manual			Remarks
		Yes	No	Not Applicable	
6.1	List of Special Tools and Tackles required for Overhaul/Trouble shooting including special testing equipment required for calibration etc.				
6.2	Stepwise dismantling and re-assembly procedure clearly specifying the tools to be used, checks to be made, records to be maintained, clearances etc. to be mentioned. Tolerances for fitment of various components to be given.				
6.3	Preventive Maintenance & Overhauling schedules linked with running hours/calendar period along with checks to be given				
6.4	Long term maintenance schedules especially for structural, foundations etc.				
6.5	Consumable list along with the estimated quantity required during commissioning, normal running and during maintenance like Preventive Maintenances and Overhaul. Storage/handling requirement of consumables/self-life.				
6.6	List of lubricants with their Indian equivalent, Lubrication Schedule, Quantity required for each equipment for complete replacement is to be given				
6.7	List of vendors & Sub-vendors with their latest addresses, service centres ,Telephone Nos., Fax Nos., Mobile Nos., e-mail IDs etc.				
6.8	List of mandatory and recommended spare parts list				
6.9	Tentative Lead time required for ordering of spares from the equipment supplier				
6.10	Guarantee and warranty clauses				
7.0	**Statutory and other specific requirements considerations.**				
8.0	**List of reference documents**				
9.0	**Binding as per requirement**				

SECTION: III

DOCUMENTS TO BE SUBMITTED BY THE BIDDER

SECTION: IIIA

LIST OF DOCUMENTS TO BE SUBMITTED WITH BID

BIDDER SHOULD SUBMIT THE SIGNED AND STAMPED COPY OF THE FOLLOWING DOCUMENTS ALONG WITH TECHNICAL BID:

1. Compliance cum confirmation certificate
2. Pre bid clarification schedule
3. No deviation certificate
4. List of Recommended Spares
5. Equipments to be supplied with Fire water tender (Annexure-II of Section - IIA)
6. Equipments to be supplied with Foam tender (Annexure-I of Section - IIA)
7. List of Maintenance Tool & Tackles (Annexure-III of Section - IIA)
8. Unpriced copy of price format.

Please note that all the schedules shall be submitted even though they may not be applicable. Under such circumstances it shall be clearly mentioned across such schedules that these are not applicable. (E.g. in case of there are no technical deviation, it shall be mentioned in the deviation schedule that 'THERE ARE NO DEVIATIONES TO THE TECHNICAL SPECIFICATION').

Name:
Signature:
Designation:
Company:
Date:

Bidder Stamp

COMPLIANCE CUM CONFIRMATION CERTIFICATE

The bidder shall confirm compliance with following by signing / stamping this compliance certificate (every sheet) and furnish same with the offer.

a) The scope of supply, technical details, construction features, design parameters etc. shall be as per technical specification & there are no exclusions, other than those mentioned under "exclusion and those resolved as per 'Schedule of Deviations', with regard to same.

b) There are no other deviations w.r.t. specifications other than those furnished in the 'Schedule of Deviations'. Any other deviation, stated or implied, taken elsewhere in the offer stands withdrawn unless specifically brought out in the 'Schedule of Deviations'

c) Bidder shall submit QP in the event of order based on the guidelines given in the specification & QP enclosed therein. QP will be subject to BHEL / CUSTOMER approval & customer hold points for inspection / testing shall be marked in the QP at the contract stage. Inspection / testing shall be witnessed as per same apart from review of various test certificates/ Inspection records etc. This is within the contracted price without any extra implications to BHEL after award of the contract.

d) All drawings/ data-sheets / calculations etc. submitted along with the offer shall not be taken cognizance off.

e) The offered materials shall be either equivalent or superior to those specified in the specification & shall meet the specified / intended duty requirements. In case the material specified in the specifications is not compatible for intended duty requirements then same shall be resolved by the bidder with BHEL during the pre-bid discussions, otherwise BHEL / Customer's decision shall be binding on the bidder whenever the deficiency is pointed out.

For components where materials are not specified, same shall be suitable for intended duty, all materials shall be subject to approval in the event of order.

f) The commissioning spares shall be supplied on 'As Required Basis' & prices for same included in the base price itself.

g) All sub vendors shall be subject to BHEL / CUSTOMER approval in the event of order.

h) Guarantee for plant/equipment shall be as per relevant clause of GCC / SCC / Other Commercial Terms & Conditions

i) In the event of order, all the material required for completing the job at site shall be supplied by the bidder within the ordered price even if the same are additional to approved billing break up, approved drawing or approved Bill of quantities within the scope of work as tender specification. This clause will apply in case during site

commissioning, additional requirements emerges due to customer and / or consultant's comments. No extra claims shall be put on this account

j) Schedule of drawings submissions, comment incorporations & approval shall be as stipulated in the specifications. The successful bidder shall depute his design personnel to BHEL's / Customer's / Consultant's office for across the table resolution of issues and to get documents approved in the stipulated time.

k) As built drawings shall be submitted as and when required during the project execution.

l) The bidder has not tempered with this compliance cum confirmation certificate and if at any stage any tempering in the signed copy of this document is noticed then same shall be treated as breach of contract and suitable actions shall be taken against the bidder.

m) Successful bidder shall furnish detailed erection manual for each of the equipment supplied under this contract at least 3 months before the scheduled erection of the concerned equipment / component or along with supply of concerned equipment / component whichever is earlier.

n) Document approval by customer under Approval category or information category shall not absolve the vendor of their contractual obligations of completing the work as per specification requirement. Any deviation from specified requirement shall be reported by the vendor in writing and require written approval. Unless any change in specified requirement has been brought out by the vendor during detail engineering in writing while submitting the document to customer for approval, approved document (with implicit deviation) will not be cited as a reason for not following the specification requirement.

o) In case vendor submits revised drawing after approval of the corresponding drawing, any delay in approval of revised drawing shall be to vendor's account and shall not be used as a reason for extension in contract completion.

SECTION: IIIC

DEVIATION SCHEDULE

DEVIATION SHEET (COST OF WITHDRAWL)

PROJECT:- 1x370 MW YELAHANKA COMBINED CYCLE POWER PLANT

PACKAGE:- FIRE TENDER

TENDER ENQUIRY REFERENCE:-

NAME OF VENDOR:-

SL NO	VOULME/ SECTION	PAGE NO.	CLAUSE NO.	TECHNICAL SPECIFICATION/ TENDER DOCUMENT	COMPLETE DESCRIPTION OF DEVIATION	COST OF WITHDRAWL OF DEVIATION	REFERENCE OF PRICE SCHEDULE ON WHICH COST OF WITHDRAWL OF DEVIATION IS APPLICABLE	NATURE OF COST OF WITHDRAWL OF DEVIATION (POSITIVE/ NEGATIVE)	REASON FOR QUOTING DEVIATION
TECHNICAL DEVIATIONS									
COMMERCIAL DEVIATIONS									

PARTICULARS OF BIDDERS/ AUTHORISED REPRESENTATIVE

NAME	**DESIGNATIONS**	**SIGN & DATE**	

NOTES:

1. For self manufactured items of bidder, cost of withdrawl of deviation will be applicable on the basic price (i.e. excluding taxes, duties & freight) only.

2. For directly dispatchable items, cost of withdrawl of deviation will be applicable on the basic price including taxes, duties & freight.

3. All the bidders have to list out all their Technical & Commercial Deviations (if any) in detail in the above format.

4. Any deviation not mentioned above and shown separately or found hidden in offer, will not be taken cognizance of.

5. Bidder shall submit duly filled unpriced copy of above format indicating "quoted" in "cost of withdrawl of deviation" column of the schedule above along with their Techno-commercial offer, wherever applicable.

6. Bidder shall furnish price copy of above format along with price bid.

7. The final decision of acceptance/ rejection of the deviations quoted by the bidder shall be at discretion of the Purchaser.

8. Bidders to note that any deviation (technical/commercial) not listed in above and asked after Part-I opening shall not be considered.

9. For deviations w.r.t. Payment terms, Liquidated damages, Firm prices and submission of E1/ E2 forms before claiming 10% payment, if a bidder chooses not to give any cost of withdrawl of deviation loading as per Annexure-VIII of GCC, Rev-06 will apply. For any other deviation mentioned in un-priced copy of this format submitted with Part-I bid but not mentioned in priced copy of this format submitted with Priced bid, the cost of withdrawl of deviation shall be taken as NIL.

10. Any deviation mentioned in priced copy of this format, but not mentioned in the un-priced copy, shall not be accepted.

11. All techno-commercial terms and conditions of NIT shall be deemed to have been accepted by the bidder, other than those listed in unpriced copy of this format.

12. Cost of withdrawl is to be given seperately for each deviation. In no event bidder should club cost of withdrawl of more than one deviation else cost of withdrawl of such deviations which have been clubbed together shall be considered as NIL.

13. In case nature of cost of withdrawl (positive/negative) is not specified it shall be assumed as positive.

14. In case of descrepancy in the nature of impact (positive/ negative), positive will be considered for evaluation and negative for ordering.

SECTION: IIID

PRE BID CLARIFICATION SCHEDULE

PRE-BID CLARIFICATION SCHEDULE

S. NO.	SECTION/CLAUSE/PAGE NO.	STATEMENT OF THE REFERRED CLAUSE	CLARIFICATION REQUIRED

The bidder hereby clarifies that above mentioned are the only clarifications required on the technical specification for the subject package.

Signature: _____

Name: _____

Designation: _____

Company: _____

Date: _____

Company Seal