Bharat Heavy Electricals Limited
(High Pressure Boiler Plant)
Tiruchirappalli – 620014, TAMIL NADU, INDIA
MATERIALS MANAGEMENT / CAPITAL EQUIPMENT

An ISO 9001 Company

ENQUIRY **NOTICE INVITING TENDER**	Phone: +91 431 257 76 53 Fax : +91 431 252 00 31 Email : skaruna@bheltry.co.in Web : www.bhel.com

	Enquiry Number: 2741300003	**Enquiry Date:** 31.05.2013	**Due date for submission of quotation:** 01.07.2013

You are requested to quote the Enquiry number date and due date in all your correspondences. This is only a request for quotation and not an order.
Please note that under any circumstances both delayed offer and late offers will not be considered. Hence vendors are requested to ensure that the offer is reaching physically our office before 14.00 hrs on the Date of tender opening.

Sl. No	Description	Quantity
1	**Design, Fabrication and supply of Combined Foam Tender including Chassis** as per the technical specification, general guidelines instructions & commercial conditions applicable (to be downloaded from web site www.bhel.com or http://tenders.gov.in)	01 set.

Important points to be taken care during submission of offer

1. **Checklist to be filled and enclosed along with the offer failing which, the offer will not be considered for evaluation.**
2. **The EMD Amount for this Tender will be (INR) : 1,50,000.00**
3. **Delivery required 4 months from the date of purchase order.**
4. **All updates, amendments, corrigenda etc (if any) will be posted only on the above websites from time to time, as and when required, until tender is opened. There will be no publication of such updates, amendments corrigenda etc. through newspapers or any other media.**

BHEL commercial terms & conditions with Price Bid and Bank Guarantee formats can be downloaded from BHEL web site http://www.bhel.com or from the Government tender website http://tenders.gov.in (public sector units) Bharat Heavy Electricals Limited page) under Enquiry reference above .

Tenders should reach us before 14:00 hours on the due date. Tenders will be opened at 14:30 hours on the due date Tenders would be opened in presence of the tenderers who have submitted their offers and who may like to be present	Yours faithfully, For **BHARAT HEAVY ELECTRICALS LIMITED** Sr. Manager / MM / Capital Equipment

S. KARUNANIDHY
Senior Manager
MM / Capital Equipment
BHEL, TRICHY - 620 014

2Supply of Combined Foam Tender as per scope of Fabrication supply and commissioning:

Fabrication of the Combined Foam Tender on the Chassis either "**TATA 1613 or Ashok Leyland 1616"**

PART: A

Specification of Chassis for Combined Foam Tender:

Application: **Operation of Fire Tender**

SPECIFICATION FOR FIRE TENDER CHASSIS:

1. a. **ENGINE**: Water cooled direct injection, turbocharged Intercooled fuel Efficient Diesel Engine with 6 Cylinders.
   b. Displacement: 5600CC to 5800CC (approx.)
   c. Maximum torque: 490NM to 550NM @ 1400 to 1800 rpm
   d. Horse power : 130 to 160HP
2) **GEAR BOX**: Minimum 5 # speed synchromesh / Min, 5 Fwd + 1 Rev

3) **REAR AXLE**: Fully floating, single speed, spiral bevel/hypoid gear.

4) **FRONT AXLE**: Heavy duty Forged I Beam, reverse Elliot type

5) **FRAME**: All steel ladder type, Heavy duty frame with bolted/riveted construction.

6) **SUSPENSION**:
   a. Semi Elliptical multi-leaf spring at front and rear.
   b. Shock absorber: Hydraulic Double acting, telescopic type on front.

7) **STEERING**: Integral hydraulic assist power steering

8) **ACCELERATION**: The acceleration from a standing start through the gears, fully laden, 64 Kms /Hr in 55 sec.

9) **WHEEL**: Front-2, Rear-4, Spare-1

Tyre: 10.00 X 20, 16 ply – Nylon

10) **ELECTRICAL SYSTEM**

a. 24V or 12 Volt system suitable Lead acid rechargeable Battery

b. Starter motor:Lucas TVS CAV or equivalent make SELF Starter motor.

c. Charging: Lucas TVS CAV or equivalent make Alternator.

11) **MAJOR DIMENSIONS:** (For chassis in mm):

a. Wheel base: 4225 mm to 4500 mm

b. Overall length: 7300 mm to 7600 mm

12) **BRAKE**: Foot brake capable of stop the vehicle within 15 mtrs at speed of 48 KM/Hr. In neutral gear hand brake capable of holding vehicle on dry surface gradient of 1:4.

(Vendor to confirm the above specification in point wise)

General Conditions:

1) **Make of Chassis shall be TATA / ASHOK LEYLAND only**.

2) Service warranty should be indicated in their offer.

3)Vendor should indicate the additional cost like Comprehensive Insurance, Road tax and temporary registration charges etc., separately in their offer.

4) All inclusive rates are considered for finalizing the offer.

5) Supplier may indicate in the offer the additional benefits that could be allowed free of cost.

6) Vendor should enclose the Technical data sheet for technical evaluation with the offer for their offered model.

Design, Fabrication and Supply of Combined Foam Tender to the following specification:

Application: Operation of Fire Tender Services.

PART: B

SPECIFICATION FOR COMBINED FOAM TENDER:

General

- Water tank-3500 Liters capacity
- Foam-500 Liters capacity
- Pump – rear mounted driven thro' PTO (PTO shall be operated from the driver cabin either Hydraulic or Pneumatic).
- Water delivery - 3200 Ltrs/min at 7.0 Kgf/cm^2, 300 Ltrs/min at 35 Kgf/cm^2(Hose Reel).
- Water foam delivery thro' Monitor and 2 side line -3000 Ltrs/min at 7Kgf/cm^2 and not less than 2500 Ltrs/min at 9 Kgf/cm^2
- Hose reel – First Aid Hose reel should be mounted at the rear of the appliances with 60m X 90mm. Single piece Hose Tubing Terminating in a shut off nozzle with an outlet of 6mm conforming type 3A of IS : 333
- Supplementary Agent – CO_2 and DCP be provided
- A Variable round the Pump proportionator should be fitted between suction and delivery of the Fire pump. The proportionator should have Five position select or valve.
- Towing hook as per IS 8298 latest edition at rear side

Material selection and treatment

Fabrication material lightness with strength and durability

Timber shall not be used

Water ways, foam compound ways shall be corrosion resistant material Pipe lines, joints flanges and all metal parts exposed to atmosphere be hot dipped and galvanized Pipes and pressure parts withstand 2 times the maximum working pressure.

Design and Construction

Super structure designed on **Modular Concept** with easy accessibility for maintenance and repairs at sub assembly and lubrication points.

Water tank

Water tank mounted on chassis capable of carrying 3500 litrs, welded construction with SS 304 sheet bottom and the side 5mm, baffles not less than 4 mm
Baffled in bothside to avoid surge while accelerating, cornering and breaking.
Tank mounted on appliances at the center of gravity.
4 nos of Folding type lifting eye on the shell of the tank for lifting the tank
Man hole in 45 cm dia on the top of the tank fitted with removable strainer
Drain cock and pipe in 75 mm dia and taken down to a point below the chassis with ground clearance
Over flow pipe in 100 mm dia
2 filling pipe for hydrant connection in 63 mm dia with male and female coupling with strainer
Water level indicator either in gaugeor acrylic tube

Plumbing

Self-filling of water tank directly from the pump thro 50 mm pipe
Plumbing between tank and pump shall have clear water way not less than 100 mm throughout with brass wire screen filter
Plumbing between pump and hose reel have clear way not less than 25 mm through out

One isolating butterfly valve of 125 mm ID between pump and outside suction hose
Direction for cock valve open/close shall be clearly marked

Priming of surface for water tank

Within 4 hrs of sand blasting of steel primer coat may be given before clearance of hydro testing or after fabrication
Epoxy treatment of 25 microns inside and outside consist of two coats before two coats of primer
Primer touch up will be done on cut edges, burnt, weld.
The tank shall be connected to the pump and hose reel and control valve with any of the operation Hydrant to tank, hydrant to reel, tank to pump to reel, hydrant pump reel to adopter 100 mm X 63 mm, pump to tank.

First aid Hose reel

Hose reel be mounted at the rear side of the appliance
Hose reel with 60 mtrs length of size dia 19 mm single piece hose tubing terminating in a shut off nozzle with dia 6mm outlet and bevel gear type to prevent over run of reel

Pump

Preferably in accordance with EN 1028 (latest) 1&2 norms or equivalent - Firex / VAS Make **(Vendor to specify).**
Two stage pump be mounted at the rear side of the appliance
Centrifugal type pump conforming to IS 5120 latest edition easy accessible to the impeller
Pump shaft shall be of stainless steel conforming to 04 Cr 18 Ni 10 of IS 6603/SS of 304. The shaft shall be supported by anti-friction bearing external to the casing, mechanical carbon seal self-adjusting type shall be provided.

Impeller neck ring shall be made of copper alloy, gun metal drain plug shall be provided

Impeller dynamically balanced and no leakage from pump casing, hydraulic pressure subjected to 1.5 times the shut of pressure and twice the rated pressure

Gun metal suction eye for 100 mm dia suction hose connection with internal strainer and gun metal blank cap fastened with SS chain

Two delivery valves at the panel 63 mm dia delivery hose coupling and gun metal blank cap with screwed type quick closing clack valve in standard hose connection

Pump shall be coupled with prime mover thro PTO unit with operating from the driver's cabin by the mode of either Hydraulic or Pneumatic operatewith having a ratio of 1:1.42. PTO shall be provided with oil level indicator and cooling circuit.

The pump shall be designed to give out put 3200Ltrs /min at 7 Kgf/cm^2

Engine revolution not to exceed 2400 rev/min when the pump is delivering its rated output at $7kgf/cm^2$

Primer

The primer shall be water seal type and shall be capable of lifting water from a depth of 7 mtrs not less than rate of 30 cm/sec

Primer shall be made by gunmetal

Provision for limit the speed of engine when prime is engaged.

When pump is primed auto disengage primer to be provided.

Cooling system

In addition to radiator cooling inter cooler tank made of 1.5 mm thick brass sheet for indirect cooling system while continuous stationed running of the engine

Gauge for cooling water and glow lamp for lubricating to be provided

Cooling water from PTO and additional cooling tank be connected thro GI pipe

Minimum 5 mtrs length flexible rubber hose shall be connected to the open end for discharge of waste cooling water

Engine cooling water shall be thermostatically controlled.
The oilin the sump shall be prevented from overheating
Gauge for cooling water and glow lamp for lubricant system shall be provided
The cooling water outlet from PTO and additional cooling tank brought backnearer to the pump discharge

Foam tank

A compound tank of 500 Ltrs capacity mounted on the chassis, shall be separated for removal and replacement
Construct with SS sheet and rigid type as per AISI 304 latest edition
Thickness shall be 2.5 mm on all area
Manhole of 450 mm dia on top with SS strainer, marked foam covered with aluminum casting plate,
Fitted with 2 lifting eye placed diagonally
Foam shall have top dished / funneling arrangement provided to enable easy filling from 20 ltrs foam drum.
Sharp edged puncturing device to be provided for puncturing foam compound drum
Foam tank fitted with removal sump and drain valve
Foam draw tube fitted with gauge strainer with mesh
Provide automatic venting of the foam compound tank
Draw tube length connected to foam compound tank as short as possible, for easily dismantling, cleaning and thorough flushing.
Provision for external source to draw foam compound thro a pick up tube
Pick up tube connection at pump control panel
Foam level indicator either in meter gauge or acrylic tube, shall also be provided at the pump control penal calibrated as empty, 1/4, 1/2, 3/4 and fullon Stainless steel plate.

Foam indicator protected with aluminum bracket sheet 1 mm thick with distinct visibility of foam levels.

Provide hand operated foam transfer pump made of gun metal capacity of 20 Ltrs/min should be fitted in a locker for filling the foam along with stainless steel / gunmetal plumbingwith ball valvearrangement.

Foam compound proportionator/ inductor

Around the pump proportionator should be fitted between suction and delivery of the pump, which will induct foam compound in to the water stream, with no loss in delivery pressure in the pump. The proportionator should compress of an induct and select valve which should have 5 parts, Calibrated to ensure the correct intake of foam liquid at the rate of 5 to 6% to supply solution for the operation of foam making branch pipe.

Provide "Off position" select for use of water tender

Foam monitor

Mounted manually operated Foam monitor on the roof locker behind the cabin Traversing 360 degree on horizontal and 60 degree vertical elevation from horizontal

Self-aspirating type flow not less than 2500Ltrs/min at 9kgf/cm^2 and expansion not less than 8 times and aggregate discharge not less than 20000 Ltrs/min at 7 Kgf/cm^2

Foam discharge distance not less than 50 mtr at 9 kgf/cm^2 pressures

Monitor assembly fabricated with light bronze alloy with locking arrangement in vertical angular position/telescopic stay rod/stand for holding monitor

Hand lines

2 hand lines be provided either side of appliance at rear in locker and kept in flaked condition

Foam making branch pipes fitted with spray / jet attachment with hand control

Capable of delivering of water foam not less than 450 Ltrs/min at 7 kgf/$cm^2$with expansion ratio of not less than 8 times and thro 20 mtrs when both are simultaneously used

Id of hose hand lines 70 mm dia length of 30 mtrsRRL / non percolating

Control of Hand line outlet shall be ball valve type with standard hose connection

Supplementary Extinguishing agent

2 sets of 2x 22.5 kg Co_2 supplementary Fire extinguishers shall be provided with accessories and standard fixation and forged grip valve, discharge nozzle,applicator tube discharge with wheel valve and hose reel. Also 2 nos of DCP Fire extinguisher of 75 Kgs with discharge hose and horn to be provided. Above each item will be mounted on lockers.

Instruments and Control

Rear pump operating control will be

Pressure gauge glycerin filled calibrated from 0 to 17.5 kg/$cm^2$and 40kg/cm2 for high pressure hose reel.

Compound gauge glycerin filled calibrated as 0 to17.5kgf/cm^2 and vacuum 0 to -1 kgf/cm^2

Engine throttle control

Foam select valve

Control valve for auxiliary foam connection

Ball valve /butterfly valve for tank to pump

Valve for engine cooling

Foam tank to induct and pump to induct isolating ball valve

Valve for hose reel control

Valve for direct filling of tank

Ball valve for monitor operation

Two 63 mm dia male instantaneous hydrant connections to be fitted with return valve with strainer. A ball valve fitted before NRV

Suction inlet of pump with isolating valve control

Two 63 mm dia female instantaneous delivery outlets of pump with wheel type quick closing clack valve

Control for flushing out the foam making equipment and its plumbing

Glow lamp for engine lubricating system

Temperature gauge for engine radiator

Engine rpm meter on dashboard in drivers cabin

Pump hour meter

The Ball valves used shall be ofstainless steel. Investment casting of CF-8(m) grade with 3 piece design

Caution plate in drivers cabin write up with PUMP ON/HAND BRAKE ON in red colour

Body work

Double compartment for driver and leader in front and crew of five in rear

Afford maximum possible vision for the crew and adequate ventilation

The seat provided for crew members out of five one seat will be facility with hold B.A System

2 hinged doors on both side ready access to driver and crew opened to out ward

Have locks with double catch striking plate

Non slip step and grab rails coated with plastic be provided for driver and crew for get in and out

Seats made with 100 mm thick foam cushion and back rest in 50 mm thick.

Hinges are heavy duty - 3 nos for crew cabin and 2 for driver cabin doors

Driver seat shall be adjustable in front and back as well as up and down

Glass of window door shall have winding type regulator and have splinter proof safety type

2 nos sun visors be provided on each side

Rear view mirror in bigger size on both sides

Provision to hold entire set of breathing apparatus to wear while on movement

The construction of the cab shall be such that the roof shall support the weight of two men without damage.

Stowage

Cab and lockers in composite construction with rigid, reinforcement, and kept as light weight

32x32x1.6 mm sqr pipe grade A of IS used for super structure with zinc passivated coated thickness 18 to 20 microns after cleaning surface

16 gauge Aluminum sheets for exterior paneling work for all over

2mm Aluminum chequered sheet for all locker, cabin floor, top of cabin roof. Quality of aluminum as per IS 737 latest edition

Lockers shall accommodate with stowage of all equipment and suitable clamp and quick release type.

Shadow marking for indicating location of equipment and articles

Locker will provide with automatic lighting arrangements with master switch

Lockers easy accessible from ground to a man of average height (1.67mtr)

The doors of the locker have efficient flush fitting spring loaded locks

The locker facilitated to carry 2 nos of 100 mm dia x 4.5 m long suction hose on the both side of the vehicle at the top.

The grab rails on both side of the top of appliance will 25.4 mm ODx1.6 mm thick and 200 mm high.

Ladder gallows

Shall be provided to carry 10.5 mtrs Aluminum extension ladder. The design shall be such that the ladder can be released without difficulty from a reasonably accessible position and embody rollers to permit easy withdrawal by one man. Means shall be provided for locking the ladder when stowed.

Tool kit container

A suitable box to be provided for carrying all normal tools

An electrical bell to be provided to send signal from pump panel to driver cabin

Foot board

Two foot board at the rear of the appliance

Stability

The appliance when fully equipped and loaded with crew, if the surface on which the appliance stands is tilted to either side should not virtues within 27 degree from the horizontal for which chassis will not be altered.

Articulation

Suspension capability test to be conducted as per approved vendor standard

Workmanship and Finish

Standard of workmanship and finish of all mechanical and other parts will fit correctly

Appliance painted with Fire red colour on the outside and cream colour in cabin and locker

Fire service insignia on both side of appliance in golden and black colour

All switches and gauges identify with embossed/ engraved name plates

Accessories:-

Fire bell

252 mm dia (natural tone carillon) fire bell mounted externally and be operated from driver cabin

Electrical siren of 2 Km range on roof of driver cabin be provided

Fog lamp

2 nos of fog lamp mounted on front bumper

Reversing lamp

Twin amber blinker light on head of driving cabin

Traficators

1 set of illuminated with indicating light on instrument panel in driver's cabin

Adjustable search light mounted in a convenient position and capable of disconnected and mounted on tripod away from appliance with 30 m TRS cable on a reel mounted

Inspection lamp with bracket protected type of wonder lead with plug provided in control panel in driver cabin

Connection for tail lamp of trailer be provided

Industrial grade trickle battery charger of minimum 6 A provided with 3 pin non-breakable plug/socket to 250 V a/c supply with 10 m main cable with charging cable connect to battery for charging 24 V battery set. Multi voltage select, red pilot lamp indicate the charge complete, provision for auto cut off , mounted under crew seat

Battery operated **PA system** of 15 watts output with mike and amplifier, loud speaker in driver's cabin.

Towing hook be provided at rear of appliance to tow a 1 ton trailer

Details of Tools and Equipments:

SL.NO	DESCRIPTION	QUANTITY
01	100mm dia Rubber suction hose in 4.5 mtrs length fitted with round threaded male and female couplingsHeavy duty made of copper alloy of 100 mm size of IS 903.	02
02	Suction strainer 100 mm dia IS 907	01
03	RRL Fire delivery hose 63 mm rubber lined in 30 m lengths complete with GM couplings of IS 636:88	10
04	Branch pipe Universal as per IS 2871	02
05	Double male adopter of IS 901	02
06	Double female adopter of IS 901	02
07	Foam Making Branch FB 5X with pick up tube of IS 2097	02
08	Collecting Breech (Gunmetal) of IS 905	01
09	Dividing Breech (Gunmetal)	01
10	Gum Boot	07
11	Foldable Stretcher	02
12	Helmet with Al.Bracket	06
13	Manila Rope 30 mtrs 1" dia of IS 1084	02
14	Search lights	03
15	Mega phone	02
16	Full face respirator	03
17	Aluminum ladder (Extendable) 35 feet as per British JCDD Spec or IND/CQAFE/PROV/0066(a) of IS 4571.	01
18	Fog nozzle (IS 952-1969) with extension applicator with fog head	01
19	Hand controlled branch for 63 mm(multi stream)	04
20	High Expansion Foam generator	01

Execution of work and using of materials in regard with fabrication of fire fighting vehicle and its accessories, workmanship, shall be related to standard specification of IS Latest Edition. **If any improvement is necessary to be added with manufacturing of appliance for modular Fire Fighting Vehicle is to be taken care by vendor.**

(Vendor to confirm the above specification in point wise)

General Conditions:

1) Fabrication of the Combined Foam Tender on the Chassis either TATA 1613 or Ashok Leyland 1616 including temporary registration and insurance.
2) It is mandatory that the vehicle will be registered in the name of BHEL Trichy. Accordingly chassis will be registered (temporary) in the name of BHEL Trichy by the supplier.
3) The cost of temporary registration and temporary insurance is included in the quoted rate by the supplier.
4) Final registration will be done by BHEL at Trichy and Insurance also is in BHEL's scope.
5) Service warranty should be indicated in their offer.
6) All inclusive rates are considered for finalizing the offer.
7) Vendor may indicate in the offer the additional benefits that could be allowed on free of cost.
8) Vendor should enclose the Technical data sheet for technical evaluation with the offer for their offered items.
9) After fabrication, finished Fire Tender shall be delivered at BHEL Stores, Trichy for which the Comprehensive Insurance, Road tax and temporary registration charges etc. shall be in BHEL's scope.
10) Stage inspection is to be indicated and to be processed further at every stage of manufacturing/fabrication based on our inspection.

Note: Tender to be processed in TWO PART system and vendor to quote technical offer and Price bid separately.

QUALIFYING CRITERIA:

1. **The vendor must be an Original Equipment Manufacturer (OEM) / Fabricator of Combined Foam Tender**
2. **At least 03 years having experience inManufacturing of Combined Foam Tender**
3. **Two Performance certificate is required from State/Central Govt. / Public Sector or one from State/Central Govt. / Public Sector and another one from Private Organization**