



An ISO 9001  
Company

# Bharat Heavy Electricals Limited

(High Pressure Boiler Plant)

Tiruchirappalli – 620014, TAMIL NADU, INDIA

CAPITAL EQUIPMENT/ MATERIALS MANAGEMENT

<b>ENQUIRY</b>	Phone: +91 431 257 76 53 Fax : +91 431 252 07 19 Email : <a href="mailto:skaruna@bheltry.co.in">skaruna@bheltry.co.in</a> Web : <a href="http://www.bhel.com">www.bhel.com</a>
<b>NOTICE INVITING TENDER</b>	

<b>TWO PART BID</b> Tender to be submitted in two parts.	<b>Enquiry Number:</b> 2621100165	<b>Enquiry Date:</b> 24.10.2011	<b>Due date for submission of quotation:</b> 24.11.2011
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You are requested to quote the Enquiry number date and due date in all your correspondence. 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.**

Item	Description	Quantity	Delivery (Item required at BHEL on)
10	Crash Fire Tender including Chassis as per the technical specification, general guidelines instructions & commercial conditions applicable (to be downloaded from web site <a href="http://www.bhel.com">www.bhel.com</a> or <a href="http://tenders.gov.in">http://tenders.gov.in</a> )	01 set	25.03.2012

## Important points to be taken care during submission of offer

1. Offer should be submitted in Two-Part System as per terms and conditions.
2. Checklist to be filled and enclosed along with the offer failing which, the offer will not be considered for evaluation.
3. Subsequent to the hosting of this Enquiry, any corrigendum to the Enquiry that may be hosted in the BHEL Web-site as well as Government Tenders-portal shall be viewed by the vendors regularly to know the details of corrigendum. In case if any vendor without seeing the corrigendum quoted as per original Enquiry and intimate that they have wrongly quoted will not be considered and rejected. However as per the appropriate Policy of BHEL action will be taken on them in this regard.

BHEL's General guidelines / instructions (refer MM/CE/GT/001) including bank guarantee formats and list of consortium banks, commercial terms check-list 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 referred 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  
  
Manager / MM / Capital Equipment

**S.KARUNANIDHY**

Manager

MM / Capital Equipment

BHEL TRICHY-620 014

## **Technical Specification for Crash Fire Tender including Chassis**

### **Part A** : Chassis References

Chassis of Fire Fighting Vehicle 16 Ton capacity & 160 HP

Wheel basis-4330 mm

Over all width-2425 mm

Turning circle Radius-8750 mm

Road clearance-268 mm

Engine – Six Cylinder,97 KW(132 PS) Direct injection

Ignition Compression Ignition

Torque (min)-45.9 mkg at 1600 to 1800 rev/min

Tyre size -10.00X20 -16 ply rating

Uses of any other chassis meeting above parameters may also be permitted

GVW-16200 Kg

FAW-6000Kg

RAW-10200Kg

Foot brake capable of stop the vehicle with in 15 mtr at speed of 48 Km/hr

In neutral gear hand brake capable of holding vehicle on dry surface gradient of 1:4

### **Qualifying criteria:**

1. Atleast 5 years having experience in manufacturing of Crash Fire Tender.
2. Customers list
3. Performance certificate

**Part B** : Specification for fabrication of Crash Fire Tender**Preferred Make** : Ashok Leyland / TATA**General**

Water tank-3500 ltrs

Foam-450 lit

Pump – rear mounted driven thro PTO

Water delivery-2250 lit/min at 7.0 Kgf/cm<sup>2</sup> not less than 3000 lit/min at 9Kgf/cm<sup>2</sup>

Water foam delivery-3900 Litr/min thro monitor and 2 side line at 7 kgf/cm<sup>2</sup>

Delivery of foam employ self aspirating system

Pump proportionate have 5 position select or valve

Hose reel be provided

Towing hook as per IS 8298 at rear side

**Material selection and treatment**

Fabrication material lightness with strength and durability

Timber 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 litres, welded construction with SS sheet bottom and the side 5mm baffles not less than 3.15mm

Baffled in both side to avoid surge while accelerating ,cornering and breaking

Tank mounted on appliances at the centre 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 in acrylic tube.

### **Plumbing**

Self filling of water tank directly from the pump thro 50 mm pipe.

Plumbing between tank and pump shall have a 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 throughout.

One isolating butterfly valve of 125 mm ID between pump and out side suction hose.

Direction for cock open and valve/closes shall be clearly marked .

### **Priming of surface for water tank**

With in 4 hrs of sand blasting steel may be given primer coat before clearance of hydro testing or after fabrication

Epoxy treatment of 25 microns inside and out side 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 mX19 mm single piece hose tubing terminating in a shut off nozzle with 6mm outlet and bevel gear type to prevent over run of reel

### **Pump**

Preferably Firex

Two stage pump be mounted at the rear side of the appliance

Centrifugal type pump conforming to IS 5120 and easy accessible to the impeller

Pump shaft in SS and supported by anti friction bearing ,mechanical carbon seal self adjusting type shall be provided.

Impeller neck ring manufacture in copper alloy, gun metal drain plug be provided

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

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

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

Pump be coupled with prime mover thro PTO unit

PTO having a ratio of 1:1.27 having control leaver in drivers cabin with lock device.PTO be provided with oil level indicator and cooling circuit

The pump be designed to give out put 4000 litre /min at 7 Kgf/Cm<sup>2</sup>

Engine revolution not exceed 2400 rev/min when pump is delivering its rated output at 7kgf/cm<sup>2</sup> and 9 kgf/cm<sup>2</sup>

### **Refer table for pump out put**

### **Primer**

Lifting water at least from 7 m depth not less than 30 cm/sec

Primer of reciprocating made by gunmetal

Provision for limit the speed of engine when prime is engage

If water ring primer, when pump is primed auto disengage primer 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 be provided  
 Cooling water from PTO and additional cooling tank be connected thro GI pipe  
 At least 5 mtr flexible rubber hose be connected to the open end for discharge of waste cooling water  
 Engine cooling water shall be thermostatically controlled  
 The oil in the sump shall be prevented from over heating  
 Gauge for cooling water and glow lamp for lubricant system be provided  
 The cooling water outlet from PTO and additional cooling tank brought back near the pump and discharge.

### **Foam tank**

A compound tank of 450 ltrs capacity mounted on the chassis ,be separated for removal and replacement.  
 Construct with SS sheet and rigid type as per AISI 304  
 Thickness shall be 2.5 mm on all area  
 Man hole of 450 mm dia on top with SS strainer , marked foam covered with aluminium casting plate  
 Fitted with 2 lifting eye placed diagonally  
 Sharp edged puncturing device 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  
 Provided automatic venting of the foam compound tank  
 Draw tube length connected to foam compound tank short as possible,  
 easily dismantled for cleaning and thorough flushing  
 Provision for external source to draw foam compound thro a pick up tube  
 Provide hand operated foam transfer pump made of gun metal capacity of 20 lit/min with SS plumbing and ball valve fitted in a locker  
 Pick up tube connection at pump control panel.

### **Foam compound proportionate**

Foam level indicator marked with  $\frac{1}{4}$ ,  $\frac{1}{2}$ ,  $\frac{3}{4}$  and full on SS plate  
 Foam indicator protected with aluminium bracket sheet 1 mm thick  
 Pump proportionate fitted between suction and delivery of the pump, it comprise of an induct and select valve have 5 parts  
 Calibrated the intake of the foam at the rate of 3 %  
 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 at 1400 lit /min at 9kgf/cm and expansion not less than 8 times  
 and aggregate discharge not less than 16800 lit /min  
 Foam discharge distance not less than 40 mtr at 9 kgf /cm<sup>2</sup> pressure  
 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 lits/min at 8 times expansion ratio at 7 kgf/cm<sup>2</sup> and thro 20 mtrs when both are simultaneously used.  
 Hose hand lines 70 mm ID, length of 30 mtrs RRL/non percolating  
 Control of Hand line outlet shall be ball valve type with standard hose connection.

### **Supplementary Extinguishing agent**

2 sets of 2x22.5 kg Co<sub>2</sub> supplementary fire extinguishers be provided with accessories and standard fixation and forged grip valve, discharge nozzle ,applicator tube discharge with wheel valve and hose also 2 nos of DCP Fire extinguishers of 75 Kgs with discharge hose and horn be provided. Above each items 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<sup>2</sup>

Compound gauge glycerin filled calibrated as 0 to 7 kgf/cm<sup>2</sup> and vacuum 0 to -1 kgf/cm<sup>2</sup>

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 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 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

Ball valves will be in SS

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 BA 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 with provision to hold BA set on the back of seat mounted in the cabin.

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

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

Glass of window door 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 side

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

## **Stowage**

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

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

16 gauge Aluminium sheets for exterior paneling work for all over

2mm Aluminium chequered sheet for all locker, cabin floor, top of cabin roof.

Quality of aluminium as per IS 737

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 4 nos of 100 mm dia x 2.5 m long suction hose on the port side of the vehicle

The grab rails on both side of the top of appliance will 25.4 mm OD x 1.6 mm thick and 200 mm high

### **Ladder gallows**

Be provided to carry 10.5 m aluminium extension ladder .Design shall be easy withdrawal by one man and means for locking facility when stowed

### **Tool kit container**

A suitable box be provided for carrying all normal tools.

**An electrical bell** 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 tilt more than 27 degree from the horizontal for which chassis will not be altered.

### **Articulation**

Suspension capability test to be conducted

### **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 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 driving 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 out put with mike and amplifier, loud speaker in drivers cabin

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

**Tools in a suitable box**

DE spanner set 6.25 mm	1 set
Ring spanner set 6.25 mm	1 set
Adjustable wrench 200 mm	1 no
Pliers cutting 200 mm	1 no
Pliers long nose 150 mm	1 no
Pipe wrench 300 mm	1 no
Screw driver 150 mm	1 no
Screw driver 250 mm	1 no
File half round smooth 150 mm	1 no
Hammer ball pen ½ kg	1 no

**Literature****Identification part list****User hand book****Repair and maintenance manual****Log book****Marking**

Appliance be marked clearly and prominently on a metal plate in drivers cabin and at rear pump operating control

Manufacturer's name and trade

Year of manufacturer ,name of equipment ,sl no,DS Cat No

Capacity of pump, water tank and foam tank in liters

Engine No, Chassis No and Pump No

A brass plate with operating/maintenance instruction suitably engraved on pump operating panel for reference of operator.

**List of Accessories be provided with the appliance.**

- |   |           |
|---|-----------|
| 1. PVC Suction hose in 2.5 meters length armoured with an internal diameter of 100 mm with standard round couplings conforming to JSS 4210-20-2001      | --4 Nos   |
| 2. Metal strainer for use with 100 mm suction hose conforming to Specification No.IND/ CQAFE/PROV/0025(a)   | -- 1 No   |
| 3 .Basket strainer for above conforming to IS 3582  | -- 1 No   |
| 4. Suction wrench for above conforming to IS 4643   | -- 1 No   |
| 5. Inspection lamp with brackets  | -- 1 No   |
| 6. Aluminium extension ladder 10.5 meters length conforming to specification No.IND/CQAFE/PROV/0066(a)  | -- 1 No   |
| 7. Suction collecting head,3-way,100mm gunmetal conforming to IS 904  | -- 2 Nos. |
| 8. 100 mm 63 mm, Hydrant to suction adapter (G.M.)  | -- 1 No.  |
| 09. Hose delivery reinforced rubber lined (RRL) 63 mm * 30 m<br>Conforming to IS 636 Type A fitted with male/ female coupling to figure 3A/2B of IS 903 | --10Nos   |
| 10. Gunmetal Branch Pipe conforming to IS 903   | -- 5 Nos. |
| 11. Fog Nozzle with applicator conforming to IS 952   | -- 2 Nos. |
| 12. Gunmetal dividing breaching with control 63 mm size conforming to IS 5131   | -- 1 No.  |
| 13. Drag Hook   | -- 2 Nos. |
| 14. No. 10 Foam Making branch pipe.   | -- 4 Nos  |
| 15. No. 10 Mechanical Foam Generator.   | -- 4 Nos  |
| 16. Hose Strap conforming to IS 5672 (Part 1 ) Type 'B' .   | -- 10 Nos |

- |   |          |
|---|----------|
| 17. Breaching collecting with 63 mm instantaneous conforming to IS 905  | -- 1 No  |
| 18. Hydrant connection complete 63 mm double armoured hose, 1 meter<br>Long each with 63 mm female instantaneous pattern delivery coupling<br>At both ends  | -- 2 Nos |
| 19. Combined key for hydrant, hydrant cover and lower valve conforming<br>To IS 910   | -- 2 Nos |
| 20. Branch pipe hand controlled for 63 mm hose couplings conforming<br>To IS 903  | -- 1 No  |
| 21. Branch diffuser for 63 mm size hose coupling conforming to IS 2871  | -- 1 No  |
| 22. Branch pipe with revolving head for 63 mm size instantaneous hose<br>Coupling conforming to IS 906  | -- 1 No  |
| 23. Adapter 63 mm double male instantaneous conforming to IS 901  | -- 2 Nos |
| 24. Adapter 63 mm double female instantaneous to IS 901   | --2 Nos  |
| 25. Nozzles conforming to IS 903  |          |
| (I) 6 mm  | --2 Nos  |
| (ii) 12 mm  | -- 2 Nos |
| (iii) 16 mm   | -- 2 Nos |
| (iv) 20 mm  | -- 2 Nos |
| (v) 25 mm   | -- 2 Nos |
| 26. Nozzles spanner for above nozzles conforming to IS 903  | --2 Nos  |
| 27 Roof mast mounted on to the vehicle with internal cable, extended height up to 5<br>mtrs from the roof, independent tilting option, free locker space, built in compressor,<br>smart remote control 230v, 4X1000 W Hallogen. |          |
| 28. Box Lamp large portable 230/250 V with battery of 6 V, 1. 1 Amp<br>Hour, 18 volts lamp, magnetic relay and battery charging circuit   | --2 Nos  |
| 29. Hand lamp 230 V, 60 W bulb with glass cover and aluminium wire net  | --4 Nos  |
| 30. Torch hand safety No. 2 for use in petroleum installations and explosive  | -- 2 Nos |

31. Breathing apparatus complete (compressed air normal air type) Conforming to Specification No. IND /CQAFE/PROV/0041(c)	2 sets
32. Fire Proximity suits with bag conforming to Specification No. IND/CIFE/PROV/0188(a) in waterproof bag of neoprene coated Nylon fabric of suitable size	--2 Nos
33. Extinguisher Fire Foam 9 litres conforming to Specification No. IND/CQFE/PROV/0004(f)	- 1 No
34. Hand held +back pack Water Mist +200 bar CAFS 10 lit capacity fire fighting system	- 2 Nos
35. Lowering line 16 mm dia 30 m long conforming to IS 1084 (Grade 2)	--1No
36. Long Line 51 mm in circumference *30 m long conforming to IS 1084 (Grade 2)	--1No
37. Short line 16 mm dia. * 15 m long conforming to IS 1084 (Grade 2)	--1No
38. canvas bucket, 18 litres capacity, MK-6 without lid conforming to IS 8857	--2Nos
39. Hose bandages conforming to IS5612 (part 2)	--4 Nos
40. Hose slings	--2Nos
41. First Aid box 10 persons	--1No
42. Rubber gloves (in case) conforming to 4770	--1pair
43. Asbestos Gauntlet (in case)	--1No
44. Shovels GS 200 mm * 240 mm	--1No
45. Pick axe conforming to IS 273	--1No
46. Crow bar with chisel and claws conforming to IS 704	--1No
47. Sledge hammer 6 kg conforming to IS 841	--1No

48. Carpenter's saw 650 mm conforming to IS 5098	--1No
49.Universal branch	-1 No
50. Fire Beaten	-2 Nos
51. Petrol driven Wood cutter	- 1No
52 .Petrol driven Metal cutter	-1No
53. Ground Monitor	-1No
54.Cutter CU 4010 c	-1No
55.Spreader SP 4230 C	-1No
56.Forciable entry tool kit	- 1No
57.Fireman helmet	-6 Nos
58.Lifebuoy(for rescue operation)	-2 Nos
59.Life jacket(for rescue operation)	-2 Nos
60.Full Body harness(Ref -PN56 for rescue purpose)	- 2Nos
61.Fall Arrester (Ref –PN 2000A for rescue purpose)	- 2Nos
62.Grib Descender (Ref –PN 401 for rescue purpose)	- 2Nos
63.Karabiner (Ref –PN 112 for rescue purpose)	- 2Nos
64.Work Positioning Lanyard (Ref –PN 242 for rescue purpose)	- 2Nos
65.Anchorage Line (Ref –PN 950 (50 Mtr) for rescue purpose)	- 2Nos
66.Portable Stretcher	-1 No
67.Mulitigas Detector	- 1 No

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 .If any improvement is necessary to be added with manufacturing of appliance for modular fire fighting vehicle may also be quoted.