Bharat Heavy Electricals Limited  
(High Pressure Boiler Plant)  
Trichirappalli – 620014, TAMILNADU, INDIA  
CAPITAL EQUIPMENT/ MATERIALS MANAGEMENT

ENQUIRY

NOTICE INVITING TENDER

<table>
<thead>
<tr>
<th>TWO PART BID</th>
<th>Enquiry Number: 2621100165</th>
<th>Enquiry Date: 24.10.2011</th>
<th>Due date for submission of quotation: 24.11.2011</th>
</tr>
</thead>
</table>

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.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Quantity</th>
<th>Delivery (Item required at BHEL on)</th>
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</thead>
<tbody>
<tr>
<td>10</td>
<td>Crash Fire Tender including Chassis as per the technical specification, general guidelines instructions &amp; 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>)</td>
<td>01 set</td>
<td>25.03.2012</td>
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</tbody>
</table>

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/cm² not less than 3000 lit/min at 9Kgf/cm²  
Water foam delivery-3900 Litr/min thro monitor and 2 side line at 7 kgf/cm²  
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 litrs, 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. Overflow 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 output 4000 litre/min at 7 Kgf/Cm²
Engine revolution not exceed 2400 rev/min when pump is delivering its rated output at 7kgf/cm² and 9 kgf/cm²

Refer table for pump output

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 ¼, ½, ¾ 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/cm² 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/cm² 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 Co2 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\(^2\)
Compound gauge glycerin filled calibrated as 0 to 7 kgf/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 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 ODx1.6 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 virtue with in 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 out side 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

Trafficators

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.

9. Hose delivery reinforced rubber lined (RRL) 63 mm * 30 m Conforming to IS 636 Type A fitted with male/ female coupling to figure 3A/2B of IS 903 -- 10 Nos.

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.


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 Long each with 63 mm female instantaneous pattern delivery coupling At both ends -- 2 Nos

19. Combined key for hydrant, hydrant cover and lower valve conforming To IS 910 -- 2 Nos

20. Branch pipe hand controlled for 63 mm hose couplings conforming 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 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 mtrs from the roof, independent tilting option, free locker space, built in compressor, smart remote control 230v, 4X1000 W Hallogen.

28. Box Lamp large portable 230/250 V with battery of 6 V, 1.1 Amp 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
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)  --2 Nos
61. Fall Arrester (Ref–PN 2000A for rescue purpose)  --2 Nos
62. Grib Descender (Ref –PN 401 for rescue purpose)  --2 Nos
63. Karabiner (Ref –PN 112 for rescue purpose)  --2 Nos
64. Work Positioning Lanyard (Ref –PN 242 for rescue purpose)  --2 Nos
65. Anchorage Line (Ref –PN 950 (50 Mtr) for rescue purpose)  --2 Nos
66. Portable Stretcher  --1 No
67. Multigas 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.