

2X250 MW SIKKA TPS
(Extn. Units # 3 & 4)

**TECHNICAL SPECIFICATION
FOR**

**FIRE WATER TENDER
& FOAM TENDER**

SPECIFICATION NO.: PE- TS- 281- 550- A001
Rev. 00



BHARAT HEAVY ELECTRICALS LTD
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
NOIDA

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TITLE

SPECIFICATION FOR FIRE TENDERS

2X250 MW SIKKA TPS

INTENT OF SPECIFICATION

DOCUMENT NO.: PE-TS-281-550-A001

VOLUME- IIB

SECTION-A

REV. 0

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1.0 SCOPE

- 1.1** Design, engineering, fabrication, manufacturing, inspection and testing at manufacturer's work, or at their sub-vendor's work, suitable painting, transportation to project site, freight, insurance and performance demonstration (including first fill of all chemicals and consumables) at site for one no. each of foam tender (including chassis), & one no. of water tender complete with all accessories as specified herein.
- 2.0** 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.
- 3.0** 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.
- 4.0** The general terms and conditions, instructions to the bidder and other attachment referred to elsewhere are here by part of this specification. The equipment materials and works covered by this specification is subjected to all the attachments referred in this specification. The bidder shall be responsible for and governed by all requirements stipulated here.
- 5.0** No deviation is permitted in normal case. Deviations if any shall be clearly brought out, otherwise it will be presumed that the bidder's offer is in line with what has been stated/asked for in this specification.
- 6.0** 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.
- 7.0** The inspection and testing of all the equipments shall be as per approved quality plan/inspection checklist.



TITLE: 2X250 MW SIKKA TPS
EXTENSION UNITS# 3 & 4

SECTION - B

PROJECT INFORMATION

INTRODUCTION

2X250 MW Sikka TPS – Extension units 3 & 4 is being set up by Gujrat State Electricity Corporation Limited(GSECL) at Sikka in the district of Jamnagar, Gujrat, India.

The Bidder shall acquaint himself by a visit to the site, if felt necessary, with the conditions prevailing at site before submission of the bid. The information given here in under is for general guidance and shall not be contractually binding on BHEL/Owner. All relevant site data /information as may be necessary shall have to be obtained /collected by the Bidder.

APPROACH TO SITE

Location :

Sikka, Jamnagar district, Latitude 22° 26 ' N & Longitude 69° 0 49' E.

The site is surrounded by villages Mungai, Sikka, Gagva & Nanikkhavri of Jamnagar District of State Gujrat.

Access by Road :

It is connected to State Highway (SH-25) by a 5 Km long road through Sikka village.

Access by Railways :

Jamnagar – Okha broadguage section is passing at a distance of 12 Km form Sikka.

Nearest Airport :

Jamnagar

Nearest Seaport:

Okha & Navalakhinare located 140 Km & 130 Km respectively from the site.



TITLE: 2X250 MW SIKKA TPS
EXTENSION UNITS# 3 & 4

PROJECT INFORMATION

1. Owner GSECL
2. Owner Consultant TCE, Bangalore
3. Project Title 2X250 MW SIKKA TPS
Extension Units # 3 & 4
4. Location 12 Km from SIKKA, District - Jamnagar
Gujrat
5. Nearest Railway Stn. Sikka
6. Ambient Air Temperature
 - a. Maximum 42 Deg.C
 - b. Minimum 8 Deg.C
7. Relative Humidity
 - a. Maximum 100%
 - b. Minimum 21%
8. Rainfall
 - a. Average annual 650 mm
 - b. Maximum 900 mm
 - c. Minimum 400 mm
9. Wind Data
 - a. Basic wind speed at 10m height
50 m/sec
 - b. Wind pressure As per IS: 875 Part III
10. Seismic Zone Zone IV as per IS: 1893-2002



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SPECIFICATION FOR WATER TENDER

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1.0.0 SCOPE

- 1.1.0 This specification covers design, engineering, construction features, manufacturing, inspection and testing at vendor's and/or his sub vendor's works, suitable painting and performance testing requirements of water tender Type-B complete with all accessories and equipments as specified herein for 2X250 MW SIKKA (Extn. Units 3 & 4).

2.0.0 CODES AND STANDARDS

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

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

3.0.0 VEHICLE CHASSIS


The chassis for carrying out fabrication work of fire water tender shall be of Make-TATA1109 EX/36-3600mmWB/ Ashok Leyland/ equivalent. The chassis shall be equipped with power assisted steering.

4.0.0 GENERAL REQUIREMENTS


- 4.1.0 The appliance shall incorporate a fire pump of 1800 l/min capacity and a water tank of 3000 litres capacity. It shall carry an extension ladder of 10.5M length and shall be capable of towing a trailer pump.

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

- | | | |
|----|--|--|
| a) | Gross vehicle weight | not less than 8500 kg including crew, water and equipments |
| 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 |

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	Road clearance Overall width	Not less than 23 cm Not more than 2.50 m	
4.3.0	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.		
4.4.0	Lubricating nipples shall be provided wherever necessary.		
5.0.0	DESIGN AND CONSTRUCTION		
5.1.0	Engine		
5.1.1	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.		
5.1.2	The operating temperature of the engine cooling water shall preferably be thermostatically controlled.		
5.1.3	The oil in the oil sump shall be prevented from overheating.		
5.1.4	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.		
5.1.5	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.		
5.2.0	Electrical System		
5.2.1	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.		
5.2.2	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.		
5.3.0	Water Tank - It shall have capacity of 3 000 litres		
5.3.1	The tank shall be constructed out of mild steel treated for anticorrosion shall be suitably mounted on the chassis in a manner keeping in view the proper load distribution on the axles. The tank shall be suitably baffled to prevent surge when the vehicle is breaking, cornering or accelerating. The baffles shall be arranged in a manner to facilitate the passage of a man throughout the tank for cleaning purposes. The tank shall be mounted on three cross bearers to counteract stresses caused by chassis flexing and shall be so secured that it can be removed. The tank body and baffle shall be minimum 3 mm thick.		

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5.3.2 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 50 mm bore pipe work or feeding the hose reel equipment. An 80 mm bore pipe line shall be taken from the tank to the suction inlet of the pump incorporating an 80 mm quick action spherical type valve. Separate valve(s) for performing the function detailed in 4.3.6 shall be provided to control the flow of water to the hose reel equipment. Drain plugs or drain cocks shall be provided wherever necessary.

5.3.3 The tank shall be given adequate anti-corrosive of epoxy treatment consisting of are coat of primer with two coats of finish paint after preparing the surface by sand blasting inside 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.

5.3.4 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).

5.3.5 The tank shall have a bolted manhole of 450 mm dia minimum. A cleaning hole of at least 250 mm dia shall also be provided at the bottom.

5.3.6 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 tanks,
- b) Hydrant reels,
- c) Tank-pump-reel,
- d) Hydrant pump-reel, and
- e) Off.

5.4.0 **Hose Reel**

5.4.1 One 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 5 mm nozzle. The reel shall be fitted with over brake or locking device.

5.5.0 **pump**

5.5.1 A centrifugal pump shall be mounted on the appliance. The pump shall be single-stage type. Anti-friction bearings external to the casing be provided so as to avoid any bearings within the pump casing. The gland shall be of the mechanical self-adjusting type.

The impeller shall be dynamically balanced. 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, etc., used in the pump casing shall be preferably of stainless steel. In case light alloy castings are used, these shall be of die-cast and without any blow holes, internal cracks,



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etc. The interior of the casting shall be smooth finished. The castings shall withstand the hydraulic pressure as specified against Cl. No. 4.5.4.

5.5.2 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 capable of full torque of the engine used for the appliance. A control lever for engaging and disengaging the pump, with suitable locking devices, shall be provided in the driver's cab.

5.5.3 The pump shall be designed to give a rated output of 1 800 litres per minute at 7 Kgf/cm² 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°C.

Output (IN L/Min.)	Pressing (IN kgf/cm ² m)	List (IN M)	Remarks
1800	7	3	When working through two 2.54 m/length of specified suction hose.

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

- | | |
|---|---|
| a) Pump casing and impeller | Aluminium alloy (die cast) conforming to IS: 617-1975* or lead tin bronze (Grade LTB2 of IS: 318-1981) |
| b) Impeller ring and impeller neck ring | Lead tin bronze (Grade LTB2 of IS: 318) for lead tin bronze pump and stainless steel (Grade 04Cr18 Ni10 of IS: 6603 of aluminium alloy pump). |
| c) Pump shaft | Stainless steel (Grade 04Cr18Ni10 of IS: 6603). |
| d) Pump panel | mild steel sheets (IS: 513 ordinary grade). |

5.5.5 **Pump Test** - The pump shall be run for a period of four hours non-stop delivering the rated output at 7 kgf/cm² with a lift of 3 m. 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 21 kgf/cm² to detect leakage, perforation, etc.

5.6.0 **Suction inlet and Delivery Valves**



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- 5.6.1 The pump shall have suction inlet(s) having 100 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.
- 5.6.2 The pump shall be provided with two delivery valves having 63 mm standard hose couplings as 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.
- 5.7.0 **Primer**
- 5.7.1 The primer shall be capable of lifting water at least 7.0 m (measured from 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.
- 5.7.2 If the primer is of the reciprocating type, means shall be provided to automatically limit the speed of engine while the primer is engaged.
- 5.7.3 The primer shall be constructed of light alloy. Casting shall have stainless steel shaft and shall be fitted with suitable lubricated bearing depending upon the type of primer.
- 5.7.4 In the case of reciprocating type primer, the selection of materials shall be made with a view that no major part is required to be replaced in course of service and the material used for these parts shall be phosphor bronze and stainless steel depending upon their respective strength and use. The caps of primer and springs shall be properly secured. The primer lever shall be easily accessible from the operator(s) position.
- 5.7.5 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.
- 5.8.0 **Control Panels**
- 5.8.1 Adequately illuminated control panel shall be provided and positioned as follows:
- a) Rear mounted pump - One control panel at the rear of the appliance.
- 5.8.2 The control panel(s) shall include the following:
- a) Throttle control for engine;
- b) Pressure gauge -0 to 17.5 kgf/cm²
- c) Compound gauge calibrated as under:
Vacuum - 0 to 75 cm Hg, preferably in black;
Pressure - 0 to 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;



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f) Cooling water circuit control.

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

- a) Water level indicator as described under cl.no. 4.3.4
- b) Five way control valve as described under cl.no. 4.3.6
- c) Hydrant connections.

5.9.0 **Body Work and Stowage**

5.9.1 Enclosed accommodation for six persons shall be provided in the driver cab-cum-crew compartment including the driver and the incharge 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.

5.9.2 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.

5.9.3 Adequate nos of lockers shall be provided for stowage of all equipment as detailed in Appendix-A. 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.


5.9.4 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.

5.9.5 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.

5.9.6 **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.

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

5.10 **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.

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6.0.0 **WORKMANSHIP AND FINISH**

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

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

7.0.0 **Accessories**

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

- a) 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.
- b) Head lamps - Two.
- c) Fog lamps - Two.
- d) Reversing light - Lamp suitably situated to assist reversing.
- e) Amber blinkers 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
- h) 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.
- m) Spot light - Adjustable, mounted in a convenient position on the near side of the driving compartment.
- n) 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.
- p) Tail lamps - Two of combined stop and tail.
- q) Rear reflectors
- r) Cab, instrument panel and locker, light



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8.0.0 MARKING

8.1.0 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 litres/minute, and of the water tank in litres; and
- c) Year of manufacture.

9.0.0 ADDITIONAL ACCESSORIES (over & above accessories mentioned against Cl.7.0.0)

The additional accessories that are normally required to assist in operation of appliance are detailed in enclosed appendix (Refer Appendix-A). Bidder to provide these accessories in there scope of supply.

10.0.0 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 I S Code.

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



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APPENDIX A

SECTION C.1

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APPENDIX-A

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 or IS 930)	1
2.0	a) Rubber lined delivery hose according to Type-II of IS: 636 in 22.5 m or 15 m length fitted with 63 mm delivery hose couplings (IS: 903)	180 m
	b) Controlled percolating hose as per IS8423 in 30 m lengths fitted with delivery hose couplings	150 m
3.0	a) Hose clamps (IS: 5612, part-I)	25
	b) Hose bandages (IS: 5612, part-II)	25
	c) Hose slings	20
	d) Hose straps	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 (2.5X4=10m).	04
5.0	3 way suction collecting head 100 mm size (IS: 904)	01
6.0	Suction wrenches for 100mm suction coupling (IS: 4634)	2
7.0	Suction Strainer 100 mm size (IS: 907)	1
8.0	Basket strainer, cylindrical type (IS: 3582)	1
9.0	Dividing breaching with control instantaneous Pattern 63 mm (IS 905)	2
10.0	Collecting breaching with control instantaneous Pattern 63 mm (IS 905)	2
11.0	a) Hydrant-stand pipe-two way (IS: 5714)	1
	b) Double female coupling (IS: 901)	2
	c) Hydrant connection, 63mm female instantaneous pattern delivery coupling at both end. (IS: 901)	2
12.0	Combined key for hydrant, hydrant cover and lower valve	2
13.0	Fog nozzle with extension applicator with fog head (IS: 952)	1
14.0	Hand controlled branch for 63 mm size hose coupling steel	1
15.0	Branch pipe universal (IS: 2871)	1
16.0	Branch with revolving head (IS: 906)	1
17.0	Branch pipe	4
18.0	Nozzles of sizes 12 mm, 16 mm, 20 mm and 32 mm (two each of Steel/GM) (IS: 903)	08



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19.0	a) Adopter for 100 mm suction female screw Coupling and 63 mm male instantaneous (G.M.) b) Adopter double female instantaneous pattern 63 mm (GM) c) Adopter double male instantaneous pattern 63 mm (GM)	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.	1 set
25.0	Portable fire extinguisher, dry powder type, 2 kg (IS: 2171)	1
26.0	Portable chemical fire extinguisher, foam type, 9 litres capacity (IS: 933)	01
27.0	Foam making branch FB-5 with pick up tube (IS: 2097)	01
28.0	Lowering Line: 50 mm hmp or terylene 40 m long having two ends spliced in and one end with a running noose (IS: 1984)	1
29.0	Long line, 50mm manila, 30 m long (IS 1084)	1
30.0	Short line, 50mm manila, 15 m long (IS 1084)	1
31.0	Canvas buckets	02
32.0	First aid box for 10 persons	1
33.0	Rubber gloves (in case) (IS: 4770)	1 pair
34.0	Asbestos gauntlets	1 pair
35.0	Axe large (IS: 703)	01
36.0	Spade	01
37.0	Pick Axe (IS: 273)	01
38.0	Crow Bar (IS: 704)	01
39.0	Sledge Hammer (IS: 841) –6.5 Kg	01
40.0	Carpenter saw 60 cm (IS: 5098)	01
41.0	Spanner – adjustable, 30 cm length handle (IS: 6169)	01
42.0	Door breaker	01



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43.0	Hydraulic jack –10 tonnes	01
44.0	Fire Hook	1
45.0	Tool kit	01
46.0	Grease gun ½ kg size lever type	02
47.0	Oil feeder	01
48.0	Can oil – 2 litres	01
49.0	Oil can – 10 litres	01
50.0	Funnel for oil or fuel filling – 250 mm	01
51.0	File bastard 30 cm (IS: 931)	01



TITLE

SPECIFICATION FOR FOAM TENDER**2X250 MW SIKKA TPS**

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1.0.0 SCOPE

This specification covers design, engineering, construction features, manufacturing, inspection & testing at vendor's and or his sub vendor's works, suitable painting and performance requirements of foam tender complete with all accessories as specified herein for 2X250 MW SIKKA TPS (Extn Units # 3, 4).

2.0.0 CODES AND STANDARDS

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

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

3.0.0 GENERAL REQUIREMENTS

3.1.0 The chassis for carrying out fabrication work of foam tender shall be of Make-TATA1109 EX/36-3600mm WB/ Ashok Leyland/ equivalent. The chassis shall be equipped with power assisted steering.

3.2.0 The appliance shall incorporate a fire pump of 1800 l/min.capacity, a water tank of 2000 ltr. Capacity, a foam tank of 500 ltr. Capacity and connected equipment for foam production and also supplementary extinguishing agent (Appendix ~~B~~ A)

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

- | | | |
|----|--|---|
| 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 |



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Road clearance

not more than 260 mm

Overall width

not more than 2.50 m

- 3.4.0 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).
- 3.3.2 The foam induction shall be automatic if one branch is in operation, all further addition and remove of branches shall automatically adjust the rate of foam compound induction within variation of 0 percent, the induction ratio not exceeding 6 percent.
- 3.5.0 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.
- 3.6.0 The supplementary agent used for fire fighting shall be dry chemical powder (2x75 Kg capacity).
- 3.7.0 The unit shall be designed to be as compact as possible, compatible with ease of accessibility to a 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.
- 3.8.0 Lever type valve controls shall be preferred.
- 3.9.0 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.
- 3.10.0 Lubricating nipples shall be provided wherever necessary.

4.0.0 DESIGN AND CONSTRUCTION**4.1.0 Engine**

- 4.1.1 The engine shall be provided with cooling system to permit its continuous stationary running without overheating. Indirect cooling system shall be incorporated which shall be of the open circuit type discharging water to the waste.
- 4.1.2 The operating temperature of the engine cooling water shall preferably be thermostatically controlled.
- 4.1.3 The oil in the oil sump shall be prevented from overheating
- 4.1.4 Suitable gauge for cooling water and glow lamp for lubricating system shall be provided in the driver's cab and on the pump panel. This shall be marked with operating temperature.
- 4.1.5 External filter shall be provided for the lubricating system and a tubular dip-stick to gauge the level of oil in the oil pump shall be provided.



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4.2.0 Electrical System

- 4.2.1 A trickle type battery charger shall be provided for recharging the battery in situ. A red pilot lamp, indicating when the batteries are being charged from an external supply, shall be provided.
- 4.2.2 All important electrical circuits shall have separate fuses 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.

4.3.0 Water Tank

- 4.3.1 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 mm thickness. The tank shall be treated for anti-corrosion with epoxy paint consisting of one coat of primer and two coats of finish after sand 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. 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 fittings shall withstand hydrostatic pressure of 0.3 bar.
- 4.3.2 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.
- 4.3.3 The tank shall be fitted with two filling orifices, a drain cock, a manhole and a cleaning hole. The filling orifice shall be of not less than 250 mm diameter and shall be fitted with a manhole cover of 45 cm 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 panel control for filling the tank through 75 mm diameter pipe or feeding the hose reel equipment. An 100 mm to pipe line shall be taken from the tank to the suction inlet of the pump incorporating an 100 mm quick action spherical type valve. Separate valve (s) for performing different functions shall be provided to control the flow of water. Drain plugs or cocks shall be provided wherever necessary cleaning hole of not less than 25 cm diameter shall be provided at the bottom of the tank and it shall be fitted with bolted cover.
- 4.3.4 The tank shall be fitted with a 50 mm diameter overflow pipe. The distance 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.
- 4.3.5 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).
- 4.3.6 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.



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- 4.3.7 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.

4.4 Hose Reel

- 4.4.1 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 con branch and 5 mm nozzle. The reel shall be fitted with over brake or locking device.

4.5.0 Pump

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 brakish 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 pump shall preferably be of the single stage type. The pump shaft shall preferably be designed to on two deep-groove ball bearings lubricated by oil both to ensure long trouble-free service mechanical seal shall be provided which shall be capable of running dry for long periods with damage.

4.5.1 PUMP TEST

The pump shall be 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 or the engine manufacturers rated temperature for continuous working whichever is less. The engine should show no sign of stress during the strees. The temperature of the cooling water (radiator water) shall not exceed 85 deg. C. The pump casing and impeller shall be subjected to a hydraulic pressure of 21 kgf/cm² to detect leakages, performance, etc.

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

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

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

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

- 4.5.6 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.

4.6 Primer –

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



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4.7.0 Foam Equipment

4.7.1 Compound Tank - foam compound tank of 500 ltrs. Capacity shall be mounted on the chassis in addition to the water tank and as a separate and distinct unit that can be removed separately for replacement.

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

4.7.1.2 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 as 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.

4.7.1.3 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 filling mount for puncturing the foam compound drum 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.

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

4.7.1.5 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.

4.7.1.6 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.



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4.7.1.7 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.

4.7.2 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.

4.7.3 Foam Monitor

4.7.3.1 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.

4.7.3.2 The aggregate foam discharge shall be not less than 7000 l/min. through monitor.

4.7.3.3 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.

4.8.0 Control panels

4.8.1 One (1) No. adequately illuminated control panel shall be provided and shall be positioned at the rear mounted pump controls.

4.8.2 The control panel shall include the following:

- a) Throttle control for engine;
- b) Throttle control for engine;
- c) Compound gauge calibrated as under;
 - (i) Vacuum - 0 to 75 cm Hg preferably in black
 - (ii) Pressure - 0 to 0.6 M/Nmm² (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.

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

- a) Control for using monitor;



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- b) Water level indicator;
- c) Hydrant connections;
- d) Control for using auxiliary foam compound pick-up tube;
- e) Control(s) for flushing out the foam making equipment and its plumbing;

4.9.0 Body Work and Stowage

- 4.9.1 Enclosed accommodation for six persons 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.
- 4.9.2 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.
- 4.9.3 Sufficient Nos. of lockers shall be provided for secure stowage of all equipment as detailed enclosed in appendix. 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.
- 4.9.4 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.
- 4.9.5 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.
- 4.9.6 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.
- 4.9.7 Tool Kit Container – A specially fitted recessed tray for the normal kit of tools, carried on the appliance shall be provided.
- 4.10 **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.

5.0.0 WORKMANSHIP AND FINISH

- 5.1.0 All parts of the appliance shall be of good workmanship and shall have streamlined finish.
- 5.2.0 The appliance shall be painted in fire red colour conforming to Shade No. 536 of IS: 5. The paint shall conform to IS: 2932-1974.



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6.0.0 ACCESSORIES

6.1.0 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
- 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) Cas, instrument panel and locker, light.
- q) Public address system.



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7.0.0 MARKING

7.1.0 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

8.0.0 ADDITIONAL ACCESSORIES

The additional accessories that are normally required to assist in operation of appliance are detailed in enclosed **Appendix B**. Bidder to provide these accessories in their scope of supply.

APPENDIX A**SUPPLEMENTARY EXTINGUISHING AGENT**

- 1.0 The supplementary extinguishing agent shall be dry chemical powder.
- 2.0 The total quantity of supplementary agent shall be not less than 150 kg. Of dry powder and shall conform to IS: 4308.
- 3.0 The dry power system shall comply with the following minimum requirement.
- 4.0 The dry powder system shall comprise of two self-contained units, each having a capacity of 75 kg of dry powder.
- 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 of the unit.
- 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 production either a straight jet or fan-spray pattern of discharge. The range of jet shall be not less than 12 m.
- 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.



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Appendix B

Schedule of equipments to be supplied with foam tender.

S.No.	Equipment / Item	Quantity
1.0	Extension ladder-10.5 meter (IS: 4571 or IS: 930)	1
2.0	Armoured suction hose complete with round thread couplings to suit the pump inlet-2.5 m long (IS: 2410 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: 905)	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 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 sets
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)	1
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)	10
	a) Adaptor for 100 mm suction female screw coupling and 63 mm male instantaneous.	2
	b) Adaptor double female instantaneous pattern 63 mm.	2
	c) Adaptor double male instantaneous pattern 63 mm.	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 presence of inflammable	2



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	gases of vapours)	
25.0	Self-contained breathing apparatus (compressed air type) complete with spare cylinder and tool kit.	1 set
26.0	First aid box for ten persons.	1
27.0	Rubber gloves (in case) (IS: 4770)	1 pair
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: 703)	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

TITLE 	SCOPE AND DOCUMENTS TO BE FURNISHED	DOCUMENT NO.: PE-TS-281-550-A001	
		REV. 0	SECTION: C.3
		SHEET	1 OF 1

1.0.0 SCOPE OF SUPPLY

1.1.0 Following is in the scope of the bidders

- A) **One (1) no. Firewater tender** as per IS: 950 with all accessories listed in this specification along with first fill of consumables for 2x250 MW Sikka TPS.
- B) **One (1) no. Foam tender** as per IS: 10460 with all accessories listed in this specification along with first fill of consumables for 2x250 MW Sikka TPS.
- C) Performance demonstration of Fire water tender at site including replenishment of consumables/chemical exhausted during the performance demonstration.
- D) Performance demonstration of Foam tender at site including replenishment of consumables/chemical exhausted during the performance demonstration.

2.0.0 DOCUMENTS TO BE FURNISHED

2.1.0 Documents to be submitted along with the bid.

- A) No deviation certificate on bidder's letter head. (Format as per Annexure I to this section)

2.2.0 Documents to be submitted during detailed engineering.

- A) G.A OF FOAM TENDER.
- B) G.A OF FIRE WATER TENDER.
- C) DETAIL OF WATER TANK FOR FOAM TENDER.
- D) DETAIL OF FOAM TANK FOR FOAM TENDER.
- E) DETAIL OF WATER TANK FOR FIRE WATER TENDER.
- F) FLOW DIAGRAM OF FOAM TENDER.
- G) FLOW DIAGRAM OF FIRE WATER TENDER.
- H) T.D.S OF FOAM TENDER.
- I) T.D.S OF FIRE WATER TENDER.
- J) QULITY ASSURANCE PLAN FOR FOAM TENDER.
- K) QULITY ASSURANCE PLAN FOR FIRE WATER TENDER.
- L) OPERATIONAL WRITE-UP FOR FOAM TENDER.
- M) OPERATIONAL WRITE-UP FOR FIRE WATER TENDER.
- N) O & M MANUAL FOR FOAM TENDER.
- O) O & M MANUAL FOR FIRE WATER TENDER.

NOTE:

- 1) Documents shall be submitted in soft as well as in hard print to BHEL. After approval of the document, 15 nos distribution prints shall be submitted by bidder.

FORMAT FOR NO DEVIATION CERTIFICATE
(To be submitted in the bidder's letter head)

BHARAT HEAVY ELECTRICALS LIMITED,
Power Sector – Project Engineering Management,
PPEI Building,HRD & ESI Complex,
Plot no. 25, Sec.16A
Noida – 201301(UP)

Sub	No Deviation Certificate.	
Job	Design, manufacturing, inspection, supply, delivery and demonstration test at site of fire tenders for 2x250 MW Sikka TPS	
Ref	1.0	Tender document no
	2.0	BHEL's NIT vide reference no
	3.0	BHEL's Amendment vide reference no .
	4.0	All other pertinent issues till date.

Dear Sirs,

With reference to above, this is to confirm that as per tender conditions, we have visited site before submission of our offer and noted the job content & site conditions etc. We also confirm that we have not changed/ modified the tender documents and in case of observance at any stage, it shall be treated as null and void.

We hereby confirm that we have not taken any deviation from tender clauses together with other references as enumerated in above referred NIT and convey our unqualified acceptance to all terms and conditions as stipulated in the tender and NIT.

We hereby confirm to unqualified compliance to technical specification together with other references as enumerated in above referred NIT.

In the event of observance of any deviation in any part of our offer at a later date whether implicit or explicit, the deviations shall stand null & void.

We confirm to have submitted offer strictly in accordance with above.

Thanking you,

Yours faithfully,

(Signature, date & seal of authorized
representative of the bidder)

S.No.	Description						
1.0.0	Total lump sum price for Fire water tender (one no) including chassis & Foam tender (one no) including chassis as specified, comprising of design & engg. Manufacture, inspection & testing at manufacturer's works / his sub-vendor's works, painting at manufacturer's works / his sub-vendor's works, transportation, delivery to site, carrying out performance demonstration at site with first fill of consumables and chemicals & accessories as listed in various appendices with all taxes and duties in line with requirements of technical specification no. PE-TS-281-550-A001	<div>(In Figure)</div> <div>(In Words)</div>					
2.0.0	Break up of prices for S.No. 1.0.0	Unit Ex- Works Price (Rs)	Total Ex-works Price (Rs)	Excise duty @	Customs Duty @	Sales TAX/VAT/any other tax on finished product	Total (Rs)
2.1.0	Supply price for 1 no. Fire water tender with complete accessories as per Technical specification						
2.2.0	Price for performance demonstration of Fire water tender at site including replenishment of consumables/chemical exhausted during the performance demonstration.						
2.3.0	Supply price for 1 no. Foam tender with complete accessories as per Technical specification						
2.4.0	Price for performance demonstration of Foam tender at site including replenishment of consumables/chemical exhausted during the performance demonstration.						
2.5.0	TOTAL LUMPSUM PRICE (S.no. 2.1.0 + 2.2.0 + 2.3.0 + 2.4.0)						
Notes:- 1) Total Lumpsum Price at 2.5.0 should match with 1.0.0.							