

**TELANGANA STATE POWER
GENERATION CORPORATION
LIMITED (TSGENCO)**

**4X270 MW BHADRADRI
THERMAL POWER PROJECT**

VOLUME – II B

**TECHNICAL SPECIFICATION
FOR
EFFLUENT TREATMENT PLANT**

SPECIFICATION NO. PE-TS-411-164-A001, R0



**BHARAT HEAVY ELECTRICALS LIMITED
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
NOIDA, INDIA**



TITLE: 4 X 270 MW BHADRADRI TPS	SPECIFICATION NO. PE-TS-411-164-A001	
	TECHNICAL SPECIFICATION FOR EFFLUENT TREATMENT PLANT	REV. NO. 00 DATE : 24/07/2017

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PROJECT INFORMATION

4x270 MW Bhadradi TPS is being set up by Telangana State Electricity Corporation Limited (TSGENCO) at Manuguru in the district of Khammam, Telangana, 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

The distance from Manuguru to Major cities in state:

City	Km
Hyderabad	345
Warangal	180
Bhadrachalam	38
Kothagudem	70
Khammam	130
Vijayawada	195

District : KHAMMAM
State : TELANGANA

Nearest Airport: The nearest airport is Vijayawada Airport but the most used airport is the Hyderabad International Airport.

Nearest Railway Station: Manuguru railway station is 10KM from nearby town. However, Warangal/ Vijaywada railway Station is major railway station near to Manuguru.

1. Owner : TSGENCO
2. Project Title : 4X270 MW Bhadradi TPS
3. Location : 16 Km from Manuguru Railway station
4. Nearest Railway Stn. : Manuguru
5. Temperature
 - a. Mean daily minimum ambient temperature during oldest month of the year: 11.5 Deg.C
 - b. Mean daily minimum ambient temperature during hottest month of the year: 45.1 Deg.C
6. Rainfall: Intensity of rainfall @ 50 mm/hr considering heaviest fall in 24 hrs
7. Wind Data: Basic wind speed at 10m height : 44 m/sec
8. Wind pressure: As per IS: 875 Part III- 1987
9. Seismic Zone: Zone III as defined in IS:1893 (part-1)-2002 according to Indian Standard Seismic Zoning Map



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10	Power Supply : The power supplies for distribution and auxiliaries shall be as under:	
	a) In plant generation	16.5kV $\pm 5\%$, 3ph, 50Hz $\pm 5\%$, high resistance earthed.
	b) MV distribution	6.6kV $\pm 6\%$, 3ph, 3w , 50 Hz, + 5 % to – 5%, Non-effectively earthed
	c) LT distribution	415V $\pm 10\%$, 3ph, 4W, 50Hz + 5% to –5%, Effectively earthed
	d) Motor rated above 160kW	6.6kV $\pm 6\%$, 3 ph 50Hz +5% to -5%.
	e) Motor rated 160kW and below all motorized actuators.	415V $\pm 10\%$, 3 ph, 50Hz +5% to -5%.
	f) For motors equal and below 30kW winding heating	24V AC ± 10 , 50 Hz %, [to be generated in 415V switchgear by vendor]
	g) DC Motors	220V DC + 10% to - 15%, 2 wire ungrounded system
	h) Control supply for relay panel/ 6.6kV breakers/415V breakers and DC emergency lighting.	220V DC + 10% to - 15%, 2 wire ungrounded system
	i) UPS for instrumentation & Control system	240V AC $\pm 1\%$, 1 ph ,50Hz $\pm 0.5\%$ 2 Wire AC system
	j) Control supply for 415V Motor contactors/AC Control circuits [to be generated in MCC /panel by vendor]	110V AC $\pm 10\%$, 50Hz + 5% to –5%.
	k) Diesel Generator emergency supply	415V $\pm 10\%$, 3ph,3W, 50Hz +5%to –5%.
	Fault levels	
	a) 400kV	40kA rms for 1 sec
	b) 6.6kV	40 kA rms for 1 sec.
	c) 415V	50 kA rms for 1 sec.
	d) DC Supply	25 kA



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SECTION – I

SPECIFIC TECHNICAL REQUIREMENTS

SUB-SECTION IA - SPECIFIC TECHNICAL REQUIREMENTS (MECHANICAL)

SUB-SECTION IB - SPECIFIC TECHNICAL REQUIREMENTS (ELECTRICAL)

SUB-SECTION IC - SPECIFIC TECHNICAL REQUIREMENTS (CONTROL & INSTRUMENTATION)



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SUB-SECTION IA

SPECIFIC TECHNICAL REQUIREMENTS (MECHANICAL)



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1.0 GENERAL

To This specification is intended to cover for SUPPLY PART , SERVICES PART & MANDATORY SPARES comprising of design (i.e. Preparation and submission of drawing/ documents including " As Built " drawings and O&M Manuals) , engineering, manufacture, fabrication, assembly, inspection / testing at vendor's & sub-vendor's works, painting, maintenance tools & tackles (as applicable), fill of lubricants & consumables, chemicals as specified, mandatory spares along with spares for erection ,startup and commissioning as required, forwarding, proper packing, shipment and delivery at site, unloading, handling, transportation & storage at site, in site transportation, assembly, minor civil works, erection & commissioning, trial run at site, preparation of drawings in 3D (if applicable) and carrying out performance guarantee /Functional / Demonstration tests at site (As applicable), training of customer/ client O&M staff (if applicable) & final handing over to end customer in flawless condition for project and **EFFLUENT TRATMENT PLANT** complete with all accessories for the total scope defined as per BHEL NIT & tender technical specification, amendment & agreements till placement of order for **4X270 MW BHADRADRI TPS**.

2.0 SCOPE OF SUPPLY (MECHANICAL)

Broad scope of supply for this package is detailed below and as indicated in relevant portion of this specification.

- 2.1 Two (2) nos. (1W+1S) effluent transfer pumps for transformer yard oily waste of unit 1 complete with all instrumentation, valves, piping, fittings, motor etc.
- 2.2 Two (2) Nos. (1W+1S) effluent transfer pumps for transformer yard oily waste of unit 2 complete with all instrumentation, valves, piping, fittings, motor etc.
- 2.3 Two (2) Nos. (1W+1S) effluent transfer pumps for transformer yard oily waste of unit 3 complete with all instrumentation, valves, piping, fittings, motor etc.
- 2.4 Two (2) Nos. (1W+1S) effluent transfer pumps for transformer yard oily waste of unit 4 complete with all instrumentation, valves, piping, fittings, motor etc.
- 2.5 Two (2) Nos. (1W+1S) Floor Wash Water Transfer pumps for Boiler area and TG area unit-1 & 2 with all instrumentation, valves, piping, fittings, motor etc.
- 2.6 Two (2) Nos. (1W+1S) Floor Wash Water Transfer pumps for Boiler area and TG area unit-3 & 4 with all instrumentation, valves, piping, fittings, motor etc.
- 2.7 Two (2) Nos. (1W+1S) Side stream filtration waste Water Transfer pumps from SSF Area 1 with all instrumentation, valves, piping, fittings, motor etc.
- 2.8 Two (2) Nos. (1W+1S) Side stream filtration waste Water Transfer pumps from SSF Area 2 with all instrumentation, valves, piping, fittings, motor etc.
- 2.9 Two (2) Nos. (1W+1S) Lamella / tube settler feed pumps complete with all instrumentation, valves, piping, fittings, motor etc.
- 2.10 Two (2) Nos. (1W+1S) Floor Wash Water Transfer pumps for ESP area unit-1 with all instrumentation, valves, piping, ventury mixer, fittings, motor etc.
- 2.11 Two (2) Nos. (1W+1S) Floor Wash Water Transfer pumps for ESP area unit-2 with all instrumentation, valves, piping, ventury mixer, fittings, motor etc.
- 2.12 Two (2) Nos. (1W+1S) Floor Wash Water Transfer pumps for ESP area unit-3 with all instrumentation, valves, piping, ventury mixer, fittings, motor etc.
- 2.13 Two (2) Nos. (1W+1S) Floor Wash Water Transfer pumps for ESP area unit-4 with all instrumentation, valves, piping, ventury mixer, fittings, motor etc.
- 2.14 Two (2) Nos. (1W+1S) Boiler Blow Down Transfer pumps for unit-1 with all instrumentation, valves, piping, fittings, motor etc.
- 2.15 Two (2) Nos. (1W+1S) Boiler Blow Down Transfer pumps for unit-2 with all instrumentation, valves, piping, fittings, motor etc.
- 2.16 Two (2) Nos. (1W+1S) Boiler Blow Down Transfer pumps for unit-3 with all instrumentation, valves, piping, fittings, motor etc.
- 2.17 Two (2) Nos. (1W+1S) Boiler Blow Down Transfer pumps for unit-4 with all instrumentation, valves, piping, fittings, motor etc.
- 2.18 One (1) no. LAMELLA CLARIFIER/TUBE SETTLER along with flocculation tank, flash mixer, fittings, oil skimmer, sludge trolley, media, plate packs, oil collection drum and all accessories.
- 2.19 Two (2) Nos. (1W+1S) Lamella clarifier / tube settler clear water transfer pump with all instrumentation, valves, piping, fittings, motor etc.



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- 2.20 Two nos. (2) Nos. (1W+1S) clarifier feed pumps with all instrumentation, valves, piping, fittings, motor etc.
- 2.21 One no. alum dosing tank for lamella clarifier / tube settler and clarifier II including slow speed gear operated agitator driven by motor complete with overflow seal, integral pipe works, valves, instrumentation and all other accessories required.
- 2.22 Four (4) (2W+2S) nos. pumps of positive displacement type suitable for dosing alum at design dosage rate specified and head as required. Pumps shall be provided with accessories such as Y-type suction strainers, pressure dampeners, safety relief valves etc for lamella clarifier / tube settler and clarifier II.
- 2.23 One no. PE dosing tank for lamella clarifier / tube settler and clarifier II including slow speed gear operated agitator driven by motor complete with overflow seal, integral pipe works, valves, instrumentation and all other accessories required.
- 2.24 Four (4) (2W+2S) nos. pumps of positive displacement type suitable for dosing PE at design dosage rate specified and head as required. Pumps shall be provided with accessories such as Y-type suction strainers, pressure dampeners, safety relief valves etc for lamella clarifier / tube settler and clarifier II.
- 2.25 One no. lime dosing tank (RCC work by BHEL) for clarifier II including slow speed gear operated agitator driven by motor complete with overflow seal, integral pipe works, valves, instrumentation and all other accessories required.
- 2.26 Two (2) (1W+1S) nos. pumps of horizontal screw type suitable for dosing lime at design dosage rate specified and head as required for clarifier II. Pumps shall be provided with accessories such as Y-type suction strainers, NRV etc.
- 2.27 One number Aerator (RCC work by BHEL) for Clarifier I along with accessories.
- 2.28 One number Stilling Chamber (RCC work by BHEL) for Clarifier I along with accessories.
- 2.29 One no. flash mixer (RCC work by BHEL) along with gear operated agitator for clarifier I.
- 2.30 One number clarifier I (RCC work by BHEL).
- 2.31 Clarifier bridge assembly along with mechanism, VFD (Variable frequency drive), hand railing, required motors, valves, piping, and instrumentation etc for clarifier I.
- 2.32 Sludge disposal system from clarifier I with piping, valves, instrumentation upto sludge collection sump as indicated in P & ID of ETP.
- 2.33 One number Stilling Chamber (RCC work by BHEL) for Clarifier II along with accessories.
- 2.34 One no. flash mixer (RCC work by BHEL) along with gear operated agitator for clarifier II.
- 2.35 One number clarifier II (RCC work by BHEL).
- 2.36 Clarifier bridge assembly along with mechanism, VFD (Variable frequency drive), hand railing, required motors, valves, piping, and instrumentation etc for clarifier II.
- 2.37 Sludge disposal system from clarifier II with piping, valves, instrumentation upto sludge collection sump as indicated in P & ID of ETP.
- 2.38 Two nos. (2) Nos. (1W+1S) clarifier I sludge transfer pumps with all instrumentation, valves, piping, fittings, motor etc.
- 2.39 Two nos. (2) Nos. (1W+1S) clarifier II sludge transfer pumps with all instrumentation, valves, piping, fittings, motor etc.
- 2.40 Two nos. (2) Nos. (1W+1S) SSF clear water transfer pumps with all instrumentation, valves, piping, fittings, motor etc.
- 2.41 One no. lime dosing tank (RCC work by BHEL) for Clarifier I including slow speed gear operated agitator driven by motor complete with overflow seal, integral pipe works, valves, instrumentation and all other accessories required.
- 2.42 Two (2) (1W+1S) nos. pumps of horizontal screw type suitable for dosing lime at design dosage rate specified and head as required for clarifier I. Pumps shall be provided with accessories such as Y-type suction strainers, NRV etc.
- 2.43 One no. PE dosing tank for Clarifier I including slow speed gear operated agitator driven by motor complete with overflow seal, integral pipe works, valves, instrumentation and all other accessories required.
- 2.44 Two (2) (1W+1S) of positive displacement type suitable for dosing PE at design dosage rate specified and head as required in Clarifier I. Pumps shall be provided with accessories such as Y-type suction strainers, pressure dampeners, safety relief valves etc.
- 2.45 One no. NaOCl dosing tank for Clarifier I including slow speed gear operated agitator driven by motor complete with overflow seal, integral pipe works, valves, instrumentation and all other accessories required.
- 2.46 Two (2) (1W+1S) of positive displacement type suitable for dosing NaOCl at design dosage rate specified and head as required in Clarifier I. Pumps shall be provided with accessories such as Y-type



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- suction strainers, pressure dampeners, safety relief valves etc.
- 2.47 Two nos. (2X100%) FeCl₃ Unloading Pump along with motors, piping, valves, fittings, instrumentation and accessories associated with the same.
 - 2.48 One no. Bulk FeCl₃ Storage Tank along with piping, valves, fittings, instrumentation, breather, seal pot and accessories associated with the same.
 - 2.49 One no. FeCl₃ dosing tank for Clarifier I including slow speed gear operated agitator driven by motor complete with overflow seal, integral pipe works, valves, instrumentation and all other accessories required.
 - 2.50 Two (2) (1W+1S) of positive displacement type suitable for dosing FeCl₃ at design dosage rate specified and head as required in Clarifier I. Pumps shall be provided with accessories such as Y-type suction strainers, pressure dampeners, safety relief valves etc.
 - 2.51 Three nos. (3) Nos. (2W+1S) PSF ACF feed pumps with all instrumentation, valves, piping, fittings, motor etc.
 - 2.52 Two nos. (2X100%) Pressure sand Filters (PSF) along with filter media, piping, valves, fittings, instrumentation and accessories associated with the same.
 - 2.53 Two nos. (2X100%) Activated Carbon Filters (ACF) along with media, carbon trap, piping, valves, fittings, instrumentation and accessories associated with the same.
 - 2.54 Two nos. (1W+1S) PSF ACF backwash pumps with all instrumentation, valves, piping, fittings, motor etc.
 - 2.55 Two nos. (2X100%) Air Blowers (Centrifugal /Twin Lobe Type) for PSF, ACF and sludge sump along with suction filter, silencer, motors, piping, valves, fittings, instrumentation and accessories associated with the same.
 - 2.56 Two nos. (2X100%) basket type strainers at Inlet to UF skid along with necessary piping, valves, fittings, instrumentation, backwash arrangement and associated accessories.
 - 2.57 Two nos. (2X50%) Ultrafiltration System (Skid based) along with piping, valves, fittings, instrumentation and associated accessories.
 - 2.58 One (1) no. UF Permeate Water Storage cum UF backwash tank (RCC work by BHEL) along with piping, valves, fittings, instrumentation and associated accessories.
 - 2.59 Two nos. (1W+1S) PSF, ACF & UF backwashed water transfer pumps with all instrumentation, valves, piping, fittings, motor etc.
 - 2.60 One (1) no. backwash water sump (RCC work by BHEL) along with piping, valves, fittings, instrumentation and associated accessories.
 - 2.61 Three nos. (3) Nos. (2W+1S) MCF feed pumps with all instrumentation, valves, piping, fittings, motor etc.
 - 2.62 Two nos. (1W+1S) UF backwash pumps with all instrumentation, valves, piping, fittings, motor etc.
 - 2.63 Two nos. (1W+1S) Micron Cartridge Filters along with piping, valves, fittings, instrumentation, backwash arrangement and associated accessories.
 - 2.64 One no. acid dosing tank for UF system with fume absorber, overflow seal, integral pipe works, valves, instrumentation and all other accessories required.
 - 2.65 Two (2) (1W+1S) of positive displacement type suitable for dosing acid at design dosage rate specified and head as required in UF system. Pumps shall be provided with accessories such as Y-type suction strainers, pressure dampeners, safety relief valves etc.
 - 2.66 One no. alkali dosing tank for UF system including slow speed gear operated agitator driven by motor complete with overflow seal, integral pipe works, valves, instrumentation and all other accessories required.
 - 2.67 Two (2) (1W+1S) of positive displacement type suitable for dosing alkali at design dosage rate specified and head as required in UF system. Pumps shall be provided with accessories such as Y-type suction strainers, pressure dampeners, safety relief valves etc.
 - 2.68 One no. bio dispersant dosing tank for UF system including slow speed gear operated agitator driven by motor complete with overflow seal, integral pipe works, valves, instrumentation and all other accessories required.
 - 2.69 Two (2) (1W+1S) of positive displacement type suitable for dosing bio dispersant at design dosage rate specified and head as required in UF system. Pumps shall be provided with accessories such as Y-type suction strainers, pressure dampeners, safety relief valves etc.
 - 2.70 One no. UF Chemical Cleaning (CIP) tank for UF system including slow speed gear operated agitator driven by motor complete with overflow seal, integral pipe works, valves, instrumentation and all other accessories required.
 - 2.71 Two (2) (1W+1S) UF Chemical Cleaning Dosing Pumps along with motor, piping, valves, fittings,



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- instrumentation and associated accessories.
- 2.72 Three nos. (3) Nos. (2W+1S) RO high pressure pumps for Stage I with all instrumentation, valves, piping, fittings, motor etc.
 - 2.73 Two (2) nos. (2X55%) RO Module for Stage-1 along with piping, valves, fittings, instrumentation and associated accessories.
 - 2.74 Three nos. (3) Nos. (2W+1S) RO high pressure pumps for Stage 2 with all instrumentation, valves, piping, fittings, motor etc.
 - 2.75 Two (2) nos. (2X55%) RO Module for Stage-2 along with piping, valves, fittings, instrumentation and associated accessories.
 - 2.76 One no. Degasser Tower along with piping, valves, fittings, instrumentation and associated accessories.
 - 2.77 Two nos. (2X100%) Air Blowers (Centrifugal /Twin Lobe Type) for degasser tower along with suction filter, silencer, motors, piping, valves, fittings, instrumentation and accessories associated with the same.
 - 2.78 One (1) no. (1 x 100%) RO Permeate Water Storage tank along with piping, valves, fittings, instrumentation and associated accessories.
 - 2.79 Two nos. (1W+1S) RO permeate water transfer pumps with all instrumentation, valves, piping, fittings, motor etc.
 - 2.80 Two nos. (1W+1S) RO reject disposal pumps with all instrumentation, valves, piping, fittings, motor etc.
 - 2.81 Two nos. (2X100%) acid Unloading Pump along with motors, piping, valves, fittings, instrumentation and accessories associated with the same.
 - 2.82 One no. Bulk Acid Storage Tank along with piping, valves, fittings, instrumentation, fume absorber, overflow seal and accessories associated with the same.
 - 2.83 One no. acid dosing tank for RO system with fume absorber, overflow seal, integral pipe works, valves, instrumentation and all other accessories required.
 - 2.84 Two (2) (1W+1S) of positive displacement type suitable for dosing acid at design dosage rate specified and head as required in RO system. Pumps shall be provided with accessories such as Y-type suction strainers, pressure dampeners, safety relief valves etc.
 - 2.85 One no. Scale inhibitor dosing tank for RO system including slow speed gear operated agitator driven by motor complete with overflow seal, integral pipe works, valves, instrumentation and all other accessories required.
 - 2.86 Two (2) (1W+1S) of positive displacement type suitable for dosing Scale inhibitor at design dosage rate specified and head as required in RO system. Pumps shall be provided with accessories such as Y-type suction strainers, pressure dampeners, safety relief valves etc.
 - 2.87 One no. SMBS dosing tank for RO system including slow speed gear operated agitator driven by motor complete with overflow seal, integral pipe works, valves, instrumentation and all other accessories required.
 - 2.88 Two (2) (1W+1S) of positive displacement type suitable for dosing SMBS at design dosage rate specified and head as required in RO system. Pumps shall be provided with accessories such as Y-type suction strainers, pressure dampeners, safety relief valves etc.
 - 2.89 One no. Na₂CO₃ dosing tank for pH correction of RO permeate water including slow speed gear operated agitator driven by motor complete with overflow seal, integral pipe works, valves, instrumentation and all other accessories required.
 - 2.90 Two (2) (1W+1S) of positive displacement type suitable for dosing Na₂CO₃ at design dosage rate specified and head as required for pH correction in RO permeate water. Pumps shall be provided with accessories such as Y-type suction strainers, pressure dampeners, safety relief valves etc.
 - 2.91 One no. RO Chemical Cleaning (CIP) tank for RO system including slow speed gear operated agitator driven by motor complete with overflow seal, integral pipe works, valves, instrumentation and all other accessories required.
 - 2.92 Two (2) (1W+1S) RO Chemical Cleaning Dosing Pumps along with motor, micron cartridge filter (1X100%), piping, valves, fittings, instrumentation and associated accessories.
 - 2.93 One no. PLC based control system along with accessories located inside ETP area.
 - 2.94 Two nos. RIO panels are in bidder's scope for all effluent lifting sumps located outside boundary of ETP area.
 - 2.95 2.0 km fiber optical cable are in bidder's scope for communication between RIO panels and PLC located in ETP area.
 - 2.96 Bidder to take care the length of piping as included elsewhere in specification of Effluent Treatment



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- plant. Pipe routing shall be decided during detailed engineering, however bidder will consider 13.5 m static head + 10% margin during pump selection for outside ETP area, Clarifier I sludge transfer pumps, SSF clear water transfer pumps, RO reject transfer pumps and RO permeate transfer pumps.
- 2.97 Pipe racks shall be provided by BHEL wherever available. However, where pipe racks are not available the pipe shall run on pipe pedestals. All auxiliary steel structures (U-clamps, nuts, bolts, channels etc.) for fixing the pipe on the pedestal or trestles shall be in the scope of bidder. If buried piping is required, Wrapping, coating and protection of all the buried pipe is also in bidder's scope & shall be as per IS 10221.
- 2.98 All steel inserts plates with lugs, rungs, ladder, puddle pipes, bolts, edge angle in desired shape, nuts, sleeves, and all other embedding components etc as required to grout in BHEL civil works and to support/hold the equipments being supplied under this specification shall be in bidder's scope.
- 2.99 Any statutory clearance required for the system from MOEF or local pollution control board in bidder's scope.
- 2.100 Initial charge of all lubricants & grease in bidder's scope.
- 2.101 All motorized valves shall be provided with integral starter.
- 2.102 Instrument hook up material shall be in bidder's scope.
- 2.103 Edge angle required in a proper shape for edge protection in civil works will be provided by bidder.
- 2.104 The pipe sizes indicated in the tender specification/ P & I diagram are minimum. Wherever pipe sizes are not indicated, the same shall be selected based on the specification requirement and shall be subject to BHEL / customer approval during detailing engineering. All pipes shall be carbon steel unless exclusively mentioned.
- 2.105 All necessary drains, vents and sampling points with valves as specified and as required are in bidder's scope.
- 2.106 Monitoring gadgets, instruments and equipments required for maintenance (till demonstration test & plant handover).
- 2.107 Associated piping, instrumentation and valves required for the system.
- 2.108 All necessary instruments and controls required for easy and safe operation of the system.
- 2.109 Wherever terminal points between BHEL and bidder indicated, bidder shall provide pipes with counter flange.
- 2.110 All pipes, fittings etc. required for hand railing, platforms, and ladders shall be in the scope of bidder. All ladders shall be non-civil work. All insert plates, nuts and bolts, puddle pipes, counter flanges wherever applicable shall be in the scope of bidder. Supply and erection of Hand railing as desired for safety purpose will be in bidder's scope.
- 2.111 All the sumps, tanks, reservoirs and other water retaining structures shall be provided with access ladders/rungs from operating platforms/ground level as the case may be and de-watering pits one for each section (civil work by BHEL).
- 2.112 Two sets of safety equipment each comprising PVC protection suits with hoods, rubber boots, face visors and thick PVC gauntlets shall also be provided by the bidder. Two nos. personnel water drench safety shower and eye bath shall be provided by the bidder near acid alkali handling area.
- 2.113 Instrumentation, valves etc. indicated in P & ID of effluent treatment plant are bare minimum requirement, however bidder has to provide complete system for trouble free operation meeting technical specification requirement.
- 2.114 Effluent lifting sumps E1, E2, E3, E4, E5, E6, E7, E8, E9, E10, E11, E12, E13, E14, E15 and E16 shall be located outside ETP area however rest facilities indicated in P & ID of ETP shall be located inside ETP area provided in plot plan included in this specification.
- 2.115 All blank flanges/counter flanges, isolations valves, tees etc. to interconnect the pipes at all terminal points.
- 2.116 Mandatory spares as per list attached in ANNEXURE VI.
- 2.117 Special tools and tackles as required for the system.
- 2.118 All special tools necessary for proper maintenance or adjustment of the equipment packaged in permanent box. Finish paints for touch-up painting of equipment after erection at site in sealed container.
- 2.119 Start-up and commissioning spares as required.
- 2.120 All the first fill and one Year's topping requirements of consumable such as greases, oil, lubricants, servo fluids/control fluids, gases and etc. which will be required to put the equipment covered under the scope of specifications, into successful commissioning / initial operation and to establish completion of facilities shall be furnished by the bidder. Suitable standard lubricants as available in India are desired. Efforts should be made to limit the variety of lubricants to minimum.



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- 2.121 Electric hoist and chain pulley block as per specification requirement.
- 2.122 RO permeate booster pumps if applicable.
- 2.123 Grouting of equipments and grouting material is in bidder's scope.

2.124 PIPING

- 2.124.1 Complete piping indicated in P & ID of Effluent treatment plant is in bidder's scope of supply and erection. In addition, any additional piping required to make the system complete inside ETP area shall be in bidder's scope. Pipe length inside ETP area has to be considered by bidder in their scope suitably.
- 2.124.2 Pipe distances from sumps outside ETP area upto inside ETP area and inside ETP area to respective location have been indicated in P & ID. Bidder to note that no commercial settlement / adjustment shall be entertained for variation upto +/- 10% of pipe lengths during detailed engineering. Distances given are from one area to other area only, however inside piping in respective area shall be in bidder's scope which has to be suitably consider by bidder as additional.
- 2.125 Two (1W+1S) Flushing pumps along with all instrumentation, valves, piping, fittings, motor etc.
- 2.126 Isolation gates as per P & ID enclosed.
- 2.127 Control valves as per P & ID enclosed.
- 2.128 Chemicals i.e. Bio dispersant, UF cleaning chemical, scale inhibitor, SMBS, Na₂CO₃ and RO cleaning chemical for continuous operation of entire ETP plant for 1 year and for pre commissioning, commissioning, trial and demonstration / PG test activities.
- 2.129 Bidder to adhere Format of operation and maintenance manual requirement as per Annexure IX during detailed engineering.
- 2.130 Bidder to adhere site storage and preservation requirement as per Annexure X during detailed engineering.
- 2.131 Bidder to adhere site General technical requirement as per Annexure XI during detailed engineering.
- 2.132 Bidder to refer Plot plan attached with this section. Location of effluent sumps is located in plot plan along with tentative routing for bidder's information.
- 2.133 Bidder to refer Annexure III for Functional / performance / demonstration guarantee requirements.
- 2.134 Bidder to refer Annexure XII for water analysis.
- 2.135 One no. equalization tank (RCC work by BHEL) along with piping, valves, fittings, instrumentation and associated accessories.
- 2.136 One no. SSF clarifier water storage sump (RCC work by BHEL) along with piping, valves, fittings, instrumentation and associated accessories.
- 2.137 One no. lamella clarifier clear water sump (RCC work by BHEL) along with piping, valves, fittings, instrumentation and associated accessories.
- 2.138 Two nos. sludge sump for Clarifier I and II (RCC work by BHEL) along with piping, valves, fittings, instrumentation and associated accessories.
- 2.139 One no. ETP clarified water storage tank (RCC work by BHEL) along with piping, valves, fittings, instrumentation and associated accessories.
- 2.140 One no. filtered water overhead tank (RCC work by BHEL) along with piping, valves, fittings, instrumentation and associated accessories.
- 2.141 Sumps E1, E2, E3, E4, E5, E6, E7, E8, E9, E10, E11, E12, E13, E14, E15, E16, common oily waste collection, RO reject sump (RCC work by BHEL) along with piping, valves, fittings, instrumentation and associated accessories.
- 2.142 Bidder to refer datasheet A for technical requirements.

3.0 SCOPE OF SUPPLY (ELECTRICAL)

Complete electrical as per specification / details indicated in Sub Section IB and IIB.

4.0 SCOPE OF SUPPLY (C&I)

Complete C&I as per specification / details indicated in Sub Section IC and IIC.

5.0 SCOPE OF SUPPLY (CIVIL)

Total Civil is in BHEL Scope of work, however Civil Input drawing shall be provided by bidder.



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6.0 SCOPE OF SERVICE

The bidder's scope also includes following services for scope under this specification:

- a. Unloading, Storage, handling and transportation at site.
- b. Minor civil work like chipping of foundation, grouting below base plate for all structures, equipment, grouting of anchor bolts wherever these are not placed in the foundation during casting of foundation itself, excavation & filling of earth for buried pipes if and as required. To the extent possible, vendor shall ensure to supply all foundation bolts timely so as to facilitate placement of these bolts while casting the foundation. Wrapping, coating and protection of all the buried pipe shall be as per IS 10221.
- c. Pre- Commissioning work such as flushing, hydraulic testing etc. Necessary consumables and instrumentation as required for inspection and testing at works as well as at site including pre-commissioning activities shall be arranged by the successful bidder at their own cost.
- d. Erection and Commissioning of entire Effluent Treatment Plant.
- e. Arrangement of all lubricants, instruments, reagents for carrying out trial run, commissioning and demonstration test.
- f. Monitoring gadgets, instruments and equipment required for maintenance (till demonstration test & Plant Hand over).
- g. All personnel required during commissioning, trial run and demonstration Test.
- h. Trial run for requisite period.
- i. Performance testing.
- j. Training of plant Owner's personnel, O&M operators' personnel on plant operation and maintenance.
- k. All other facilities/ services as described in section on site services in specification and related to Effluent Treatment Plant scope of work.
- l. Relevant requirements as per GTR, GCC, ECC & SCC.
- m. Any other service required for making the installation complete in all respect within battery limits and for satisfactory erection & commissioning of the system as well as to meet any statutory requirement relevant to the package, unless specifically excluded from scope of services.
- n. Painting as per enclosed painting schedule ANNEXURE V. However, any variation in the painting schedule as finally approved by customer / BHEL shall be taken care by bidder without any commercial and delivery implication. Colour-coding scheme shall be intimated to vendor during detailed engineering.

7.0 TERMINAL POINTS

- a. Service water line (50 NB) will be provided by BHEL at 5 m distance from ETP area. Further distribution inside ETP area will be in bidder's scope. Bidder to note that pressure available at terminal point for service water will be 2 kg/cm² approx (max.); hence bidder will take care for their pump lubrication / cooling accordingly.
- b. Instrument air pipe (25 NB) will be provided by BHEL at 5 m distance from ETP area. Further distribution inside ETP area will be in bidder's scope.
- c. Service air pipe (25 NB) will be provided by BHEL at 5 m distance from ETP area. Further distribution inside ETP area will be in bidder's scope.
- d. DM plant regeneration waste shall be terminated by DM plant vendor in ET tank.
- e. CT blowdown shall be terminated by BHEL in ET tank.
- f. Fuel oil waste shall be terminated by Fuel oil vendor in Common oily waste collection sump.



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8.0 EXCLUSIONS

- 8.1 All civil works including foundation of equipment, excavation & back filling. However complete grouting for equipment, grouting material, fixing and any concreting inside vessels and lining shall be in the scope of the bidder.
- 8.2 Main pipe trestles.
- 8.3 Air conditioning, ventilation & firefighting facilities.
- 8.4 Other exclusions are mentioned in the electrical & C&I parts of this specification.
- 8.5 Service water up to terminal points.
- 8.6 Acid, alkali, PE, FeCl₃, NaOCl, lime and alum Chemicals.

9.0 QP AND SUBVENDOR APPROVAL:

- 9.1 Minimum QP requirements are specified as Annexure I. However, any additional comments as given by BHEL/Customer shall be adhered by the bidder without any commercial & delivery implication to BHEL.
- 9.2 The sub vendor list (Annexure- II) enclosed is indicative only and is subject to BHEL and Customer approval during detailed engineering stage without any commercial & delivery implication to BHEL.
- 9.3 Bidder to propose sub vendor list with following back up documents within 4 weeks of placement of LOI/LOA. Thereafter no request for additional sub-vendor shall be entertained. The sub vendor list shall subject to BHEL and Customer approval during detailed engineering stage without any commercial & delivery implication to BHEL.
- 9.4 Bidder to assess the capability of their proposed sub-vendors in terms of preparation of drawings, calculations, documents, quality assurance, supply of material etc. as per project schedule before placing the order on them.
- 9.5 Dealers are not acceptable for any item of the package. Bidder shall procure all items including plates, structural, flanges; counter flanges etc. from approved sub vendor only.

10.0 DESIGN /CONSTRUCTION

In addition to the requirements of Section I and II the following shall also be complied under scope of this specification.

The P&I diagram is enclosed herein in this section for bidder's compliance.

The material of construction specified in data Sheet-A are minimum requirements and material of construction for other components not specified shall be similarly selected by the bidder for intended duty which shall be subject to BHEL / Customer approval during detail engineering without any commercial & delivery implication to BHEL.

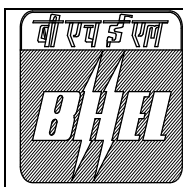
11.0 INFLUENT QUALITY AND OUTLET GUARANTEE PARAMETERS:

11.1 INFLUENT QUALITY:

- a) FREE OIL & FLOATING OIL IN LAMELLA CLARIFIER / TUBE SETTLER: 50 PPM
- b) TSS IN LAMELLA CLARIFIER / TUBE SETTLER: 500 PPM
- c) TSS IN CT (COOLING TOWER) BLOWDOWN: AS PER ANALYSIS ATTACHED.
- d) TDS IN CT (COOLING TOWER) BLOWDOWN: AS PER ANALYSIS ATTACHED.
- e) TSS FROM DM PLANT REGENERATION WASTE: 200 PPM
- f) TSS FROM SIDE STREAM FILTRATION BACKWASH WASTE: 6000 PPM
- g) TDS FROM DM PLANT REGENERATION WASTE: 1400 TO 6000 PPM
- h) CLARIFIED WATER WILL BE USED FOR WASHING

11.2 OUTLET GUARANTEE PARAMETERS:

- a) OIL QUANTITY AT LAMELLA CLARIFIER / TUBE SETTLER OUTLET: As per Annexure III
- b) TSS AT LAMELLA CLARIFIER / TUBE SETTLER OUTLET: As per Annexure III
- c) TSS AT CLARIFIER I AND II OUTLET: As per Annexure III



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- d) TSS & TURBIDITY AT PSF OUTLET: As per Annexure III
e) CHLORINE AT ACF OUTLET: As per Annexure III

12.0 DRAWING/DOCUMENTS REQUIREMENT

- 12.1 For the Drawings/Documents distribution Procedure, please refer attached Annexure-IV. Bidder has to submit the revised drawing/document along with the compliance sheet indicating enumerate reply to all BHEL and customer comments or observations. Without compliance sheet the submission of the drawings/documents will not be considered and the delay on this account will be solely on bidder's side only. The numbers of soft copies & hard copies of drawing/documents to be submitted by the bidder shall be as per enclosed Annexure-IV.
- 12.2 After award of LOI/LOA, drawing/documents to be submitted by the bidder for BHEL/Customer approval has been indicated in Annexure VII. However, any additional drawing/document if found necessary for completion of the engineering, the same shall be submitted by bidder without any commercial & delivery implication to BHEL.
- 12.3 Bidder to note that the successful bidder, during detail engineering, will submit the drg/doc through web based Document Management System in addition to hard copies to be submitted as per the Annexure IV of this specification. Bidder would be provided access to the DMS for drg/doc approval and adequate training for the same. Detailed methodology would be finalized during the kick-off meeting. Bidder to ensure following at their end:
- Internet explorer version – Minimum Internet Explorer 7
 - Internet speed – 2 mbps (Minimum preferred)
 - Pop ups from our external DMS IP (124.124.36.198) should not be blocked
 - Vendor's Internal proxy setting should not block DMS application's link (<http://124.124.36.198/wrenchwebaccess/login.aspx>)
 - DMS user manuals to be used by BHEL PEM vendors for uploading, viewing, revising, commenting and tracking documents on PEM's DMS have been uploaded on PEM internet website (www.bhelpem.com) under the Vendor session.
 - For quick access bidder may refer the link <http://bhelpem.com/DMSManuals/DMSManuals.html>

13.0 SPARES

The Bidder shall include in his scope of supply all the necessary Mandatory spares, start up and commissioning spares as indicated in the relevant sections of specifications. The general requirements pertaining to the supply of these spares is given below: -

13.1 MANDATORY SPARES

- a. The list of mandatory spares which is to be considered by bidder in their scope are indicated in Annexure VI.
- b. All mandatory spares shall be delivered at site at least two months before scheduled date of initial operation of the first unit. However, spares shall not be dispatched before dispatch of corresponding main equipments.
- c. Wherever quantity is specified both as a percentage and a value, the Bidder has to supply the higher quantity until and unless specified otherwise.
- d. Inspection of mandatory spares shall be in line with the approved quality plans for the respective items/equipments. The inspection categorization of mandatory spares shall also be in line with the approved Categorization plan for the respective items/equipment.



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13.2 START-UP & COMMISSIONING SPARES

- a. Start-up and commissioning spares are those spares which are required during the start-up and commissioning of the equipment/system. All spares used till the plant is handed over to the BHEL/Customer shall come under this category. The Bidder shall provide for an adequate stock of such start up and commissioning spares to be brought by him to the site for the plant erection and commissioning. They must be available at site before the equipments are energized. The unused spares, if any, should be removed from there only after the issue of Taking Over certificate. All start up spares which remain unused at the time shall remain the property of the Bidder.
- b. The Bidder shall indicate the service expectancy period for the spares under normal operating conditions before replacement is necessary.
- c. All spares supplied under this contract shall be strictly inter changeable with the parts for which they are intended for replacements. The spares shall be treated and packed for long storage under the climatic conditions prevailing at the site e.g. small items shall be packed in sealed transparent plastic with desecrator packs as necessary.
- d. All the spares (mandatory) shall be manufactured along with the main equipment components as a continuous operation as per same specification and quality plan.
- e. Each spares part shall be clearly marked or labelled on the outside of the packing with its description. When more than one spares part is packed in a single case, a general description of the content shall be shown on the outside of such case and a detailed list enclosed. All cases, containers and other packages must be suitably marked and numbered for the purposes of identification.
- f. All cases, containers or other packages are to be opened for such examination as may be considered necessary by BHEL / Customer.
- g. The Bidder will provide the BHEL/Customer with all the addresses and particulars of his sub suppliers while placing the order on vendors for items/components/equipments covered under the contract and will further ensure with his vendors that the BHEL/Customer, if so desires, will have the right to place order for spares directly on them on mutually agreed terms based on offers of such vendors.
- h. The Bidder shall warrant that all spares supplied will be new and in accordance with the contract Documents and will be free from defects in design, material and workmanship.
- i. The bidder to provide datasheets/assembly drawings of the manufacturer/ any other relevant document showing Bill of Material(s), Make, Model Number, Part Number etc. through which the mandatory spares to be supplied can be uniquely identified.

Any other documents submitted by bidder except as asked in the bid's specification shall not be evaluated & considered as null & void.

14.0 ADDITIONAL REQUIREMENT

- Lamella clarifier dosing system, UF system, dosing system of UF system, RO system, dosing system of RO system shall be located in side industrial shed. Rest all equipment / facilities shall be located outside open to sky.
- Control room and MCC room shall be located inside single story RCC building. Chemical storage for alum, lime, PE, NaOCl, & Na₂CO₃ shall be located in side industrial shed adjacent to control room for 15 days. Storage space for one-time chemical cleaning chemicals (Scale inhibitor, SMBS, Bio dispersant, alkali, RO and UF chemical cleaning chemicals) of UF and RO system shall also be provided by bidder in this shed. However, FeCl₃ and acid shall be stored in bulk tanks for 15 days requirement outside in open.



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- Bidder to submit BBU during detailed engineering after approval of Basic documents. BBU shall be equal to BOQ for the package and there shall be no price and delivery implication is applicable to BHEL / customer for the same. None of the items supplied for the project as non-billable. Incomplete BBU shall not be review by BHEL. Further during detail engineering breakup of supply prices of Effluent treatment plant in the Billing break up schedule shall be prepared as per below mentioned details:

1.0	THE BREAK UP (%) OF SUPPLY PRICES OF EFFLUENT TREATMENT PLANT IN THE BBU SHALL BE IN LINE WITH THE BELOW PROVIDED DETAILS:	
1.1	Lump sum firm price for supply of Atmospheric tanks and pressure vessels along with accessories inclusive of all taxes, duties and other levies as applicable.	10% of Total Supply Price.
1.2	Lump sum firm price for supply of Valves inclusive of all taxes, duties and other levies as applicable.	15% of Total Supply Price.
1.3	Lump sum firm price for supply of Instruments & analysers inclusive of all taxes, duties and other levies as applicable.	13% of Total Supply Price.
1.4	Lump sum firm price for supply of Pumps & Blowers with motor inclusive of all taxes, duties and other levies as applicable.	21% of Total Supply Price.
1.5	Lump sum firm price for supply of Piping & Fittings inclusive of all taxes, duties and other levies as applicable.	14% of Total Supply Price.
1.6	Lump sum firm price for supply of Clarifier assembly, lamella clarifier / tube settler plates & media, agitators, strainers along with accessories inclusive of all taxes, duties and other levies as applicable.	6% of Total Supply Price.
1.7	Lump sum firm price for supply of PLC system ,UPS with battery & battery charger, ACDB & BHMS (as applicable) inclusive of all taxes, duties and other levies as applicable.	5% of Total Supply Price.
1.8	Lump sum firm price for supply of UF and RO system along with accessories inclusive of all taxes, duties and other levies as applicable.	12% of Total Supply Price.
1.9	Lump sum firm price for supply of Balance Miscellaneous items inclusive of all taxes, duties and other levies as applicable.	4% of Total Supply Price.

- Any statutory requirement / clearance required for the package from government / local body shall be in bidder's scope.
- All interconnecting piping, valves, fittings including dosing piping, drain piping from tanks to nearby drain, flushing lines from nearest available water source, valves, fittings and accessories is also in bidder's scope.
- All the vertical pumps shall be self-lubricating type.
- Document approval by customer under Approval category or information category shall not absolve the vendor of their contractual obligations of completing the work as per specification requirement. Any deviation from specified requirement shall be reported by the vendor in writing and require written approval shall be taken from BHEL. Unless any change in specified requirement has been brought out by the vendor during detail engineering in writing while submitting the document to customer for approval, approved document (with implicit deviation) will not be cited as a reason for not following the specification requirement.
- KKS numbering if required, as per BHEL/Customer requirement shall be provided by the Bidder during detailed engineering stage without any commercial/delivery implication to BHEL.
- Any item/work either supply of equipment or erection material which have not been specifically mentioned but are necessary to complete the works for trouble free and efficient operation of the plant shall be deemed to be included within the scope of this specification. The bidder without any extra charge shall provide the same.
- Buried piping shall be protected as under (as per IS-10221).
 - Surface cleaning by wire brush, power tool cleaning etc.
 - Apply one coat of coaltar/primer/enamel.



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- Apply one layer of tape comprising of coaltar. Application of tape shall conform to AWWA C-203/IS 10221 (Appendix-B) with Minimum thickness of tape as 4MM +10%
- All drawings/documents shall be approved by BHEL/Customer during detailed engineering stage. Successful Bidder shall comply with the comment of the customer/BHEL without price & delivery implication.
- Successful bidder shall furnish detailed erection manual for each of the equipment as well as complete system supplied under this contract at least 3 months before the scheduled erection of the concerned equipment / component or along with supply of concerned equipment / component whichever is earlier.
- Final Electrical Load list will be submitted by the successful bidder as per agreed drawing/ doc submission schedule. Thereafter any change in the electrical load list shall be entertained only subject to its feasibility, and BHEL reserves the right to debit the vendor cost of any changes necessitated in the switch gear /MCC on account of changed loads.
- Wherever CIVIL works is excluded from the bidder's scope, successful bidder shall furnish civil assignment / scope drawings. The corresponding CIVIL drawing prepared by BHEL / CIVIL agency, based on civil assignment drawing of bidder will be furnished to the successful bidder for concurrence. In case any modification is required in the civil work already carried out based on final civil inputs given by bidder, BHEL reserves the right to debit cost of such rework to bidder.
- In case vendor submits revised drawing after approval of the corresponding drawing, any delay in approval of revised drawing shall be to vendor's account and shall not be used as a reason for extension in contract completion.
- Bidders shall make Site visit in order to familiarize themselves with existing condition of site before submitting the bid in order to make their offer complete. During detail engineering also, the successful bidder shall be responsible for the correctness of details w.r.t. existing facility at site. Customer approval on any drawing having details of existing facility shall not be cited by the successful bidder a valid reason for any shortcoming in the work by them. BHEL shall also not entertain any cost implication for any lack of input data with regard to site during detail engineering.

15.0 PAINTING

Painting shall be Annexure V of technical specification. Internal painting of the equipments shall be suitable for withstanding effect of effluent. Outer painting shall be as per technical specifications. Supporting documents shall be furnished in support of suitability of the lining offered for the duty conditions by bidder during detailed engineering.

16.0 PLANT OPERATION AND CONTROL

Effluent treatment plant shall be controlled from PLC.

The control philosophy of various systems is described below. However, for all the systems, following basic process related interlocks, alarms /pre-warning signals shall be implemented in the control system as per system requirement.

- a) Among the equipments, it shall be possible to select a specific pump or tank or sump for working/standby/ maintenance etc through control system.
- b) Permissive & Interlocks:
 - (i) Starting & tripping of pumps with respect to liquid level in the respective sump/tanks or liquid pressure in the suction lines.
 - (ii) Starting & tripping of agitators with respect to liquid level in the respective sump/tanks.
 - (iii) Starting & tripping of pumps (which are provided with forced water lubrication) with respect to lubricating water flow (through low pressure/ low flow signal as the case may be).
 - (iv) Tripping of pumps when the discharge pressure is very high to avoid operation of the pump under shutoff head.



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- (v) Stopping/ tripping of equipments due to abnormal parameters related to safety of equipments like high vibration, very high bearing lubrication water (and /or oil) temperature to the drive/pumps, very high bearing temperature of the of pump/drive etc as applicable based on the recommendations of Equipment Supplier.
- (vi) Automatic opening of the re-circulation valve to pre-set percentage, in case of failure of opening of pump(s) discharge valve to ensure minimum flow through the pump, as per the recommendation of manufacturer.
- (vii) Automatic starting of standby pumps upon failure of starting of selected pump or tripping of running pump as the case may be.
- (viii) Capacity of the metering pump shall be controllable from 10-100% continuously by adjusting the stroke length manually by a micro meter dial calibrated for 0–100% of pump capacity integral with the pump.
- (ix) Various annunciations related to low level of the chemical tanks & sumps shall be provided.
- c) Alarms /Signals
 - (i) Abnormal parameters such as low & high level in tanks/sumps, high pressure at pump discharge, low header pressure, low lubrication water flow to pumps (provided with forced water lubrication system) etc.
 - (ii) Failure of starting of equipments such as pumps, blowers etc. upon start command.
 - (iii) Tripping of equipments due to protection logic.

In addition, the control system shall facilitate the operator to know the status of various equipments (Whether equipment is running or stopped or tripped etc, whether the equipment is selected for operation/ standby duty /maintenance mode etc as the case may be).

MATERIAL HANDLING EQUIPMENTS

1.0 ELECTRIC HOIST AND MANUAL HOIST (CHAIN PULLEY BLOCK)

Required number of electric hoist / manual hoist of adequate capacity, to meet the erection and maintenance requirements are to be provided for the various areas where handling weight is more than 500 kg.

Manual hoists (hand operated) shall be designed to duty class 2 as per IS 3832 and electric wire rope hoist shall be designed as per IS: 3938 (latest).

The stipulations of all statutory codes like Indian Electricity Act, Indian Electricity Rules, Factory Acts, Local Municipality act etc. shall however prevail over the specification requirements, in case any conflict arises between this specification and the statutory codes.

Maintenance tools and tackles shall be as per data sheet attached.

DESIGN CRITERIA

For the hoists with more than 2.0 tonne lifting capacity and/ or more than 10.0 M lift i.e. either capacity or lift is more than 2T or 10 m, Electrical hoist shall be provided. Less than or equal to 2T and lift < 10m hoist blocks shall be of hand operated type for both travel and lift.

However, all monorails coming out of the building shall be provided with electric hoist block, irrespective of load and lift.

Capacity of electric and manual (Chain pulley block) hoists shall be decided keeping 25% margin over heaviest equipment to be handled.



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For hand operated hoists, the hoists shall be suitable for operation from floor level. Hand chain shall be provided for long travel of trolley and the Hoisting mechanism. For electric hoist, operator shall be able to control the movement of the electrical hoist with the help of floor operated pendant

Note;

- Travel and Lift are layout dependent and shall be finalized during detail engineering without any commercial implication
- Additional electric/manual hoist required during detail engineering shall be provided as per design criteria given above without any commercial implication.

2.0 SCOPE OF SUPPLIES

Equipment and services to be furnished by the bidder for the ELECTRIC HOIST/ MANUAL HOIST with accessories as per the details given in the technical specification and data sheet A. Any equipment / accessories not specified in the specification but required to make the ELECTRIC HOIST/ MANUAL HOIST complete and efficient operation shall also be under the bidder's scope of work.

Compliance with this specification shall not relieve the bidder of the responsibility of furnishing material and workmanship to meet the specified working/duty conditions.

2.1 ELECTRIC HOIST

Electric hoist shall include but not be limited to the following: -

- a. Hoisting and CT drive arrangement
- b. All electrical equipment including cables (as per electrical scope matrix) and panels.
- c. PVC insulated shrouded bus bar DSL
- d. Earthing arrangement.
- e. Fill of lubricant till commissioning / handling over to customer.
- f. Painting of electric hoist and accessories.
- g. Maintenance tools & Tackles
- h. Erection & Commissioning spares
- i. Isolating switch in enclosure at operating floor for disconnecting supply to DSL while maintaining the electric hoist.
- j. Mandatory spares

2.2 MANUAL HOIST (CHAIN PULLEY BLOCK)

Manual hoist shall include but not be limited to the following:

- a. Chain pulley blocks with/without traveling trolleys
- b. Maintenance Tools and Tackles
- c. Mandatory spares

2.3 Erection and Commissioning spares (ELECTRIC HOIST)

The Bidder shall also supply erection & commissioning spares along with his main equipment as per his experience, for replacement of damaged or unserviceable parts during the execution of the project at site, to avoid delay in the project schedule. This shall form part of the main equipment supply. The Purchaser shall retain the unutilized commissioning spares. The initial fill of lubricants, oil etc. shall also be supplied by the bidder.

2.4 Services to be provided by the bidder

Packing, forwarding and transportation to site, storage and handling at site.

2.5 Erection and Commissioning

2.6 Functional test (Overload testing, load testing at rated speed, travel and hoisting motion checks as per relevant Indian standards)

2.7 Obtaining clearance and acceptance certificate from the concerned competent authority after site test as applicable. Necessary fees/expenditure as required shall be borne by the supplier.

3.0 Inspection and Testing



TITLE: 4 X 270 MW BHADRADRI TPS	SPECIFICATION NO. PE-TS-411-164-A001	
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Inspection and testing shall be carried out as per enclosed standard quality plan approved QAP and as per IS 3938 (latest revision). Prime inspection agency shall be NBPPL/End Customer. Equipment supplied shall be strictly in accordance with nomenclature & technical specification. Any additional testing requirement/ CHP(Customer Hold Point) at any stage of inspection deemed necessary by Customer/NBPPL during detailed engineering shall be carried out without any commercial or technical implication.

4.0 Works Excluded

Supply of ISMB monorail.

5.0 PAINTING SPECIFICATION

As per painting details specified elsewhere in specification.

ELECTRIC HOIST COLOR SHADE:

Colour shade: Structure: Golden Yellow, RAL 1004

Panel: Opaline green for exterior and semi glossy white for interior

MANUAL HOIST COLOR SHADE:

Trolley: Lemmon yellow (Shade 355 as per IS 5)

Hook: Light grey (Shade 631 as per IS 5)

6.0 PACKING

As per packing details specified elsewhere in specification.

7.0 DEMONSTRATION TEST

Hoist along with its drives, controls and other accessories shall be demonstrated for the rated capacity against the rated speed of motions and for the service conditions specified as specified in QAP and as per IS 3938 for electric hoist and IS 3832 for manual hoist.

The bidder shall have the full responsibility for the safe and efficient operation of the hoist with associated accessories as a single unit.

If the shop/site performance tests indicate the failure of any of the components to achieve the guaranteed performance, the deficiency shall be made good at bidder's cost.

Demonstration tests shall be carried out each time after the rectification /modification is carried out.

8.0 MAKE OF SUB - VENDOR ITEMS

Makes of bought out items will be as per list specified in the specification. No other make will be acceptable, until and unless specifically got it approved by the purchaser/ end client.

9.0 TESTING AT SITE

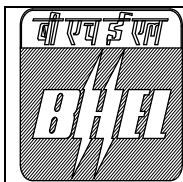
A) ELECTRIC HOIST:

As required for statutory clearance for operating at site i.e., overload test, load test and other tests as per IS 3938.

Test for Operation -After the supply has been connected, tests shall be carried out to prove the following:

- a) The satisfactory operation of each controller, switch, contactor, relay and other control devices and in particular the correct operation of all limit switches under the most unfavorable conditions;
- b) The correctness of all circuits and interlocks and sequence of operation; and
- c) The satisfactory operation of all protective devices.

Overload Test -After test but before the hoist is put into service, it shall be tested with overload relays appropriately set, to lift and sustain a test load of 125 percent of the working load. During the overload test, the hoist shall sustain the load under full control. The specified speeds need not be attained but the hoist shall show itself capable of dealing with the overload without difficulty.



TITLE: 4 X 270 MW BHADRADRI TPS	SPECIFICATION NO. PE-TS-411-164-A001	
	TECHNICAL SPECIFICATION FOR EFFLUENT TREATMENT PLANT	
	REV. NO. 00	DATE : 24/07/2017

B) MANUAL HOIST:

As required for statutory clearance for operating at site with following minimum test i.e., overload and load test.

10.0 Maintenance Tools and Tackles

One (1) complete unused new set of special purpose tools, tackles and accessories along with detailed instructions and maintenance manual shall be supplied for each EH/CPB. Tools shall be of suitable sizes for maintenance of electric hoist of each type and capacity. Each tool shall be stamped so as to be identified easy for its use. The tools shall be supplied in steel toolbox. The items supplied shall be of the best quality, specially protected against rusting. The following shall be provided as minimum requirement:

S-No.	Description	Qty.
1	Complete set of ring spanners (Indicate the sizes offered)	1 Set
2	Complete set of screwdrivers (Indicate the sizes)	1 Set
3.	Adjustable Spanner	1 No.
4.	Insulated plier	1 No.
5.	Grease gun	1 No.
6.	Oil gun	1 No.
7.	Line tester	1 No.

Note: - Bidder shall ensure that the tools & tackles mentioned in above list are sufficient to handle all sizes/capacities of hoists & in case any other /additional tool is required for handling/maintenance any size/capacity of hoist the same shall be included in this list.



TITLE:
4 X 270 MW BHADRADRI TPS

SPECIFICATION NO. PE-TS-411-164-A001

**TECHNICAL SPECIFICATION FOR
EFFLUENT TREATMENT PLANT**

REV. NO. 00

DATE : 24/07/2017

ANNEXURE I
QUALITY PLAN

QUALITY ASSURANCE

Tests/Check		Material Test	WPS/PQR/Welder Qualification	DPT/MPI	Assembly Fit up	Dimension	RT	Hydraulic / Water Fill	Performance Test	Test as per relevant Std/ Appd. Data Sheets	Other Tests	Remarks
Items / Components												
1. Horizontal Centrifugal Pumps									Y ¹	Y		LEGENDS: Y Applicable Y ^a One per Heat/Heat Treatment batch./Lot Y ^b On machined surfaces only. Also 100% on Butt Welds & 10% on Fillet Welds. Y ^c UT shall be done for shafts with Dia 50 mm or above & Plates of Thickness 20 mm or above. Y ^d Dynamic Balancing per ISO: 1940, Grade 6.3 minimum.
1.1. Casing		Y ^a		Y ^b				Y				
1.2. Impeller		Y ^a		Y ^b							Y ^d	
1.3. Shaft		Y ^a		Y						Y ^c		
2. Vertical Pumps					Y	Y			Y ¹	Y		
2.1. Casing		Y ^a		Y ^b				Y				
2.2. Impeller		Y ^a		Y ^b							Y ^d	
2.3. Shaft		Y ^a		Y						Y ^c		
2.4. Fabricated Parts		Y ^a	Y	Y ^b			Y ²	Y	Y ¹	Y		
3. Dosing/ Metering Pumps		Y ^a						Y	Y ¹	Y		
4. Gate/ Globe/ Check Valves		Y ^a		Y ^b		Y		Y	Y	Y	Y ⁶	
5. Dual Plate Check Valves		Y ^a		Y ^b		Y		Y	Y	Y	Y ¹²	
6 Diaphragm Valves		Y ^a				Y		Y ³	Y	Y	Y ⁴	
6. Butterfly Valves (Low Pr.)					Y	Y		Y ³	Y		Y ⁵	
7.1Body (Cast)		Y ^a		Y ^b								
7.2Disc (Cast)		Y ^a		Y ^b								
7.3 Shaft		Y ^a		Y ^b							Y ^c	
8. Plug/ Ball Valves (Low Pr.)		Y ^a		Y ^b	Y	Y		Y	Y	Y		
9. Blowers		Y ^a		Y ^b	Y	Y		Y	Y	Y	Y ^{6c}	
10. Atmospheric Storage Tanks/ Pressure Vessels		Y ^a	Y	Y ^b	Y	Y	Y ⁸	Y		Y ^c	Y ⁷	

QUALITY ASSURANCE

Tests/Check Items / Components	Material Test	WPS/PQR/Welder Qualification	DPT/MPi	Assembly Fit up	Dimension	RT	Hydraulic / Water Fill	Performance Test	Test as per relevant Std/ Appd. Data Sheets	Other Tests	Remarks
11. Rubber lining	Y ^a				Y				Y	Y ⁹	Y ⁷ Heat Treatment of the Tank/Vessel shall be done per fabrication code requirement. Welded dished ends shall be stress relieved. Dished ends manufactured by cold working shall be stress relieved as per the requirement of code.
12. Reactor Clarifier	Y ^a	Y	Y ^b	Y	Y				Y	Y ¹⁰	
13. Clariflocculator/ Plate or Tube Settler	Y ^a			Y	Y				Y		Y ⁸ RT as per fabrication code requirements. However, dished ends welds, if manufactured by using welded plates shall be subjected to 100% RT.
14. Hoists & Cranes	Y ^a	Y	Y ^b	Y	Y	Y ⁸		Y	Y		Y ⁹ Rubber Lining Mix shall be subjected to Bleed Resistance Test on mould sample. Adhesion Test, Spark Test and Hardness Test for the Rubber lined jobs shall also be conducted.
15. Chlorine Tonner	Y ^a	Y	Y ^b	Y	Y	Y ⁸	Y				
16. Chlorine Evaporator	Y ^a	Y	Y	Y	Y	Y	Y				
17. Chlorinator & injector	Y ^a			Y	Y		Y	Y			
18. Agitators /Flash Mixer/ Flocculator	Y ^a	Y	Y ^b	Y	Y			Y		Y ¹⁰	Y ¹⁰ Gear Boxes shall be checked for smooth No Load Operation at shop to verify noise and vibration levels. Gear Ratio and Kerosene Leak Test shall also be conducted.
19. Pipes	Y ^a	Y		Y	Y		Y		Y		Y ¹¹ One Fan of each type & size shall be routine performance tested as per corresponding code for air flow, static pressure, total pressure, speed, efficiency, power consumption, noise & temperature rise. Also all Fans shall be subjected to run test of 4 hours during which noise, vibration, temperature rise and current drawn shall be measured.
20. Ventilation/Exhaust Fan	Y ^a		Y ^b	Y	Y			Y ¹¹	Y	Y ^{dc}	Y ¹² Blue Matching, reduced pressure test for check valves shall be conducted per relevant standards. Dry cycle test on valve spring for 100000 cycles shall be carried out as type test, if not carried out earlier, for the similar MOC, size and type of spring.
After erection, the complete Piping system along with valves & fittings shall be hydraulically tested.											

NOTE:- Category of inspection for items / equipment shall be decided by BHEL only during detailed engineering. All the inspection shall be carried out by BHEL or its designated agency only. And further no customer / consultant inspection is envisaged.

THIS IS A PART OF TECHNICAL SPECIFICATION NO. PE-TS-411-164-A001

MANUFACTURER'S NAME & ADDRESS :		PROJECT :	
MANUFACTURING QUALITY PLAN		PACKAGE : CHAIN PULLEY BLOCKS	
ITEM : Chain Pulley Block		VOL IIB, SEC C	
QP No.: PE-TS-XXX-XXX-A001			
REV.:0, Date:., PAGE: 1 OF 4			

Sr. No.	COMPONENT / OPERATION	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY	REMARKS
1.	2.	3.	4.	5.	6.	7.	8.	9.	M C N 10.	11.

1	RAW MATERIAL & B/OUT ITEMS:									
1.1	HOOKS	DIMENSIONS,	MA	LAB ANALYSIS	One sample	IS: 15560	IS: 15560	MTC	✓	UT FOR SHANK DIA 50MM AND ABOVE
		CHEMICAL COMPOSITION, MECHANICAL, PHYSICAL PROPERTIES	MA		PER LOT	Material specification as per approved drawings		T.C.	✓	
		IDENTIFICATION & COMPLIANCE WITH TC.	MA	VISUAL	100%	HOOK TC FROM COMPETENT AUTHORITY		IR	✓	
		INTERNAL DEFECTS	MA	UT	100%	ASTM A-388 (REFER NOTE 1)		TC	✓	
		PROOF LOAD TEST	MA	REVIEW	100%	IS 15560		TC	✓	
		NDT AFTER PROOF LOAD	MA	DPT	100%	ASTM E-165	NO RELEVANT IDENTIFICATION	TC	✓	
1.2	LOAD CHAIN	- DIMENSIONS	MA	MEASUREMENT	100 %	IS: 6216 & APPD. DRGS.	IS: 6216 & APPD. DRGS.	IR	✓	
		- BREAKING STRENGTH	MA	-TENSILE TEST	1/LOT			MTC	✓	
		- PROOF LOAD	MA	-TENSILE TEST	100%			HT	✓	
		-HEAT TREATMENT	MA	REVIEW	100%			CHA	✓	
		-GRADE	MA	REVIEW	1/BATCH			RT	✓	
1.3	RAW MATL. FOR GEAR/ RATCHET PAWL / RATCHET WHEEL	CHEMICAL COMPOSITION, MECHANICAL PROPERTIES	MA	LAB ANALYSIS	ONE SAMPLE PER LOT	MATERIAL SPECIFICATION AS PER	MATERIAL SPECIFICATION AS PER	MTC	✓	TC or inspection report for components

LEGEND:		FOR CUSTOMER USE	
MANUFACTURER / CONTRACTOR	** M : MANUFACTURER / SUB-CONTRACTOR C : BHEL / NOMINATED INSPECTION AGENCY. N : CUSTOMER		
SUB-CONTRACTOR SIGNATURE	INDICATE "P" PERFORM "W" WITNESS AND "V" VERIFICATION		
	REVIEWED BY	NAME & SIGN OF APPROVING AUTHORITY & SEAL	

THIS IS A PART OF TECHNICAL SPECIFICATION NO. PE-TS-411-164-A001

MANUFACTURER'S NAME & ADDRESS :		PROJECT :	
ITEM : Chain Pulley Block		PACKAGE : CHAIN PULLEY BLOCKS	
QP No.: PE-TS-XXX-XXX-A001		VOL IIB, SEC C	
REV.:0, Date:., PAGE: 2 OF 4			

Sr. No.	COMPONENT / OPERATION	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY	REMARKS
1.	2.	3.	4.	5.	6.	7.	8.	9.	M C N 10.	11.

		INTERNAL DEFECTS	MA	UT	10%	APPROVED DRAWING	APPROVED DRAWING	IR	P	shall be given.
1.4.	LOAD CHAIN WHEELS	- CHEMICAL COMPOSITION MECHANICAL PROPERTIES	MA	CHEMICAL MECHANICAL PROPERTIES	ONE SAMPLE PER LOT	APPD. DRG.	APPD. DRG.	MTC	P	
1.5	BEARINGS	MAKE, TYPE, CATALOGUE NO.	MA	VISUAL	RANDOM	APP DRG / MFR'S CATALOGUE	APP DRG / MFR'S CATALOGUE	IR	P	
1.6	HAND CHAIN WHEEL	CHEMICAL MECHANICAL PROPERTIES	MA	CHEMICAL MECHANICAL PROPERTIES	ONE SAMPLE PER LOT	AS PER DRAWING	AS PER DRAWING	MTC	P	
1.7	HAND CHAIN	GRADE/ DIMENSION	MA	GRADE DIMENSION	100 %	AS PER DRAWING	AS PER DRAWING	MTC	P	
1.8	TROLLEY GEARS, PINION, WHEELS, AXLE	CHEMICAL & MECHANICAL	MA	LAB ANALYSIS,	100%	APPVD DRGS	APPVD DRGS	IR/T C	P	
2	IN PROCESS									
2.1	RATCHET PAWL / RATCHET WHEEL	-HARDNESS	MA	HARDNESS	100%	IS:3832 / APPD DRG.	IS:3832/ APPD. DRG.	IR	P	

		LEGEND: ** M : MANUFACTURER / SUB-CONTRACTOR C : BHEL / NOMINATED INSPECTION AGENCY. N : CUSTOMER INDICATE "P" PERFORM "W" WITNESS AND "V" VERIFICATION	FOR CUSTOMER USE	
MANUFACTURER / CONTRACTOR				
SUB-CONTRACTOR SIGNATURE			REVIEWED BY	NAME & SIGN OF APPROVING AUTHORITY & SEAL

THIS IS A PART OF TECHNICAL SPECIFICATION NO. PE-TS-411-164-A001

MANUFACTURER'S NAME & ADDRESS :		PROJECT :	
ITEM : Chain Pulley Block		PACKAGE : CHAIN PULLEY BLOCKS	
QP No.: PE-TS-XXX-XXX-A001		VOL IIB, SEC C	
REV.:0, Date:., PAGE: 3 OF 4			

Sr. No.	COMPONENT / OPERATION	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY	REMARKS
1.	2.	3.	4.	5.	6.	7.	8.	9.	M C N 10.	11.

		-SURFACE CRACK	MA	DPT	100 %	ASTM E165	NO DEFECT	IR	✓	P	V	V	
2.2	GEARS AND PINIONS AFTER MACHINING	SURFACE HARDNESS HEAT TREATMENT, SURFACE CRACK, CASE DEPTH	MA	HARDNESS HT CHART, DPT FOR SURFACE CRACK	RANDOM ASTM E 165 FOR DPT	MFG STANDARD NO DEFECT	MFG STANDARD	IR	✓	P	V	V	
3.0	FINAL INSPECTION												
3.1	COMPLETE ASSEMBLY	OVERALL DIMENSION	MA	MEASUREMENT	100 %	IS:3832 /APPD DRG	IS:3832 /APPD DRG	IR	✓	P	W	V	
		PROOF LOAD TEST	CR	LOAD TEST	100%	-DO-	No cracks, flaws & other defects	IR	✓	P	W	V	
		LIGHT LOAD TEST	MA	LOAD TEST	100%	IS 3832	IS 3832	IR	✓	P	W	V	
		HEIGHT OF LIFT	MA	MEASUREME NT	100%	-DO-	-DO -	IR	✓	P	W	V	
		SWIVELING OF HOOK	MA	VISUAL	100 %	-DO-	-DO-	IR	✓	P	W	V	
		EFFORT	MA	PULL ON CHAIN	100%	-DO-	-DO-	IR	✓	P	W	V	
3.2	PAINTING	-CLEANING	MA	VISUAL	AT RANDOM	APPROVED	APPROVED	IR		P	--	--	
		- SHADE & DFT OF PAINT (Blue / Black)	MI	VISUAL	AT RANDOM	DRAWING/ SPECIFICATION	DRAWING/ SPECIFICATION	IR		P	W	-	

LEGEND:		FOR CUSTOMER USE	
MANUFACTURER / CONTRACTOR	** M : MANUFACTURER / SUB-CONTRACTOR C : BHEL / NOMINATED INSPECTION AGENCY. N : CUSTOMER		
SUB-CONTRACTOR	INDICATE "P" PERFORM "W" WITNESS AND "V" VERIFICATION		
SIGNATURE	REVIEWED BY		NAME & SIGN OF APPROVING AUTHORITY & SEAL

THIS IS A PART OF TECHNICAL SPECIFICATION NO. PE-TS-411-164-A001

MANUFACTURER'S NAME & ADDRESS :		PROJECT :	
ITEM : Chain Pulley Block		PACKAGE : CHAIN PULLEY BLOCKS	
QP No.: PE-TS-XXX-XXX-A001		VOL IIB, SEC C	
REV.:0, Date:., PAGE: 4 OF 4			

Sr. No.	COMPONENT / OPERATION	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTU M OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY	REMARKS
1.	2.	3.	4.	5.	6.	7.	8.	9.	M C N 10.	11.

3.3	NAME PLATE	VERIFICATION	MA	VISUAL	100%			IR	P V --	
3.4	PACKING	-VERIFICATION	MI	VISUAL	100%	SPECS.	SPECS.	IR	P -- -	
3.5	REVIEW OF QA DOCUMENTATION	VERIFICATION	MA	VISUAL	100%	APPD. QP	APPD. QP	✓	V V V	

CR – CRITICAL, MA – MAJOR , MI – MINOR

NOTE 1: BACK WALL ECHO SHALL BE ADJUSTED TO 100% OF FULL SCREEN HEIGHT IN SOUND (DEFECT FREE) AREA. DEFECT ECHO HEIGHT MORE THAN 20% OF SCREEN HEIGHT SHALL BE TREATED AS UNACCEPTABLE. BACK WALL ECHO SHALL NOT BE LESS THAN 80% OF SCREEN HEIGHT IN ANY CASE.

NOTE 2: RECORDS IDENTIFIED WITH TICK SHALL BE ESSENTIALLY INCLUDED IN QA DOCUMENTATION.

LEGEND:		FOR CUSTOMER USE	
MANUFACTURER / CONTRACTOR	** M : MANUFACTURER / SUB-CONTRACTOR C : BHEL / NOMINATED INSPECTION AGENCY. N : CUSTOMER INDICATE "P" PERFORM "W" WITNESS AND "V" VERIFICATION		
SUB-CONTRACTOR SIGNATURE			
	REVIEWED BY	NAME & SIGN OF APPROVING AUTHORITY & SEAL	

THIS IS A PART OF TECHNICAL SPECIFICATION NO. PE-TS-411-164-A001

गोपनीय दस्तावेज़										MANUFACTURERS NAME & ADDRESS										STANDARD QUALITY PLAN										PROJECT									
AS PER APPROVED VENDOR LIST										ITEM:		QP NO		REV		DATE		PAGE		REFERENCE DOCUMENT		ACCEPTANCE NORMS		FORMAT OF RECORD		AGENCY		REMARKS											
										WIRE ROPE		REV		DATE		PAGE		REV		DATE		PAGE		REV		DATE		PAGE		REV		DATE							
										WIRE ROPE		REV		DATE		PAGE		REV		DATE		PAGE		REV		DATE		PAGE		REV		DATE							
										WIRE ROPE		REV		DATE		PAGE		REV		DATE		PAGE		REV		DATE		PAGE		REV		DATE							
CHARACTERISTICS										CATEGORY		TYPE OF CHECK		EXTENT OF CHECK		7		8		9		D*		M		C		N											
3										4		5		6		7		8		9		D*		M		C		N											
1.0 RAW-MATERIALS																																							
1.1 a) STRUCTURAL MATERIAL b) RAW MATERIAL FOR HOIST AND GEAR BOX HOUSING, TROLLEY PLATE (AS APPLICABLE)										MA		CHEMICAL COMPOSITION AND TENSILE STRENGTH		1 / lot		APPD. DRG. / DATA SHEET		APPD. DRG. / DATA SHEET		Mill.s TC		✓		V		V		V		Test shall be carried out in absence of mill TC									
1.2 GEARS, SHAFT/AXLES, WHEELS										MA		CHEMICAL COMPOSITION, HARDNESS (DURING IN-PROCESS)		1 / LOT		APPD. DRG. / DATA SHEET		APPD. DRG. / DATA SHEET / IS:3938		LAB. REPORT / MANUFACTURER'S TEST CERTIFICATE		✓		P		V		V		In case the items are not manufactured in-house, the manufacturer's test certificate shall be submitted for chemical									
										CR		NDT		100%		ASTM A 388		NOTE 4		INSFN. REPORT		✓		P		V													
1.3 WIRE ROPE										MI		Dia.		100%		APPD. DRG. / DATA SHEET		APPD. DRG. / DATA SHEET		MFRS'TEST CERT.		✓		P		V		V											
										CR		BREAKING LOAD CAPACITY		100%		APPROVED DRG./DATA SHEET / IS:3938 / IS: 2266		APPROVED DRG./DATA SHEET AND / IS:3938 /		MFRS'TEST CERT.		✓		P		V		V											
1.4 HOOKS										MA		CHEMICAL COMPOSITION, HARDNESS		1 / LOT		APPROVED DRG./DATA SHEET / IS:3938 / IS:15560		APPROVED DRG./DATA SHEET / IS:3938 / IS:15560		MFRS'TEST CERT.		✓		P		V		V											
										CR		NDT		100%		ASTM A 388		NOTE 1		INSFN. REPORT		✓		P		W		V		SHANK PORTION ONLY									
										CR		PROOF LOAD TEST		100%		APPROVED DRG./DATA SHEET / IS:3938 / IS:15560		APPROVED DRG./DATA SHEET ± IS:3938 / IS:15560		INSFN. REPORT		✓		P		W		V											
										CR		NDT		100%		ASTM E-165		NO CRACKS		INSFN. REPORT		✓		P		V/W		V											
2.0 IN-PROCESS																																							
2.1* WELDING PROCEDURE SPECIFICATION										MA		SCRUTINY		100%		IS:7307 / ASME SEC IX		IS:7307 / ASME SEC IX		FORMAT OF IS IX		P		V		V		V											
2.2* PROCEDURE & WELDER QUALIFICATION										MA		PHYS. TESTS/RT		100%		IS:7310 / ASME SEC IX		IS:7310 / ASME SEC IX		AS PER ASME SEC IX		✓		P		W		W		IN CASE OF LLOYDS / EIL / TPL QUALIFIED WELDERS AVAILABLE, REQUALIFICATION OF WELDER IS NOT REQUIRED									
										LEGDS																													
MANUFACTURER/ SUB CONTRACTOR										CONTRACTOR																													
SIGNATURE																																							

THIS IS A PART OF TECHNICAL SPECIFICATION NO. PE-TS-411-164-A001

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TITLE: 4 X 270 MW BHADRADRI TPS
TECHNICAL SPECIFICATION FOR EFFLUENT TREATMENT PLANT

SPECIFICATION NO. PE-TS-411-164-A001	
REV. NO. 00	DATE : 24/07/2017

ANNEXURE II

SUB VENDOR LIST

The sub vendor list below is indicative only and is subject to BHEL and customer approval during detailed engineering stage without any commercial & delivery implication to BHEL. Bidder to propose sub vendor within 4 weeks of placement of LOI. thereafter no request for additional sub-vendor shall be entertained. Dealers are not acceptable for any item of the package. bidder shall procure all items including plates, structural, flanges; counter flanges etc. from approved sub vendor only. The inspection category will be intimated after award of contract by BHEL/customer. however, the same will be adhered by the bidder without any commercial and delivery implication to BHEL/ customer.

SR. NO.	ITEM	SUPPLIERS	PLACE	REMARKS
1.	PRESSURE VESSELS	GLOBAL STRUCTURES & COMPOSITE LTD	-	
		JASMINO POLYMERTECH	TALOJA	
		SYSCON ENGINEERS	AMBERNATH	
		S.V. FABRICATORS	NAVI MUMBAI	
		SPARK FABRICATORS / STEELCON	-	
		ANUP ENGINEERING	AHMEDABAD	
		MURTHAL TANKS & VESSELS	SONEPAT	
		TITAN ENGG.	DURGAPUR	
		RISHI INDUSTRIES	BAHALGARH	
		UNIVERSAL HEAT EXCHANGERS	-	
		ATS CHEM	SALEM/HOSUR	
		CHEM PROCESS SYSTEM	SANAND	
		PROGEN	CHENNAI	
		CRYSTAL ENGINEERING	HOSUR	
		ISHAN EQUIPMENTS	VADODARA	
2.	ATMOSPHERIC/ STORAGE TANKS	GLOBAL STRUCTURES & COMPOSITE LTD	-	
		JASMINO POLYMERTECH	TALOJA	
		SYSCON ENGINEERS	AMBERNATH	
		S.V. FABRICATORS	NAVI MUMBAI	
		SPARK FABRICATORS / STEELCON	-	
		ANUP ENGINEERING	AHMEDABAD	
		MURTHAL TANKS & VESSELS	SONEPAT	
		TITAN ENGG.	DURGAPUR	
		RISHI INDUSTRIES	BAHALGARH	
		UNIVERSAL HEAT EXCHANGERS	-	
		ATS CHEM	SALEM/HOSUR	
		CHEM PROCESS SYSTEM	SANAND	
		PROGEN	CHENNAI	
		CRYSTAL ENGINEERING	HOSUR	
		ISHAN EQUIPMENTS	VADODARA	
3.	RUBBER LINING (AT SHOP)	TEMSEC	KOLKATA	
		RISHI INDUSTRIES	SONEPAT	



TITLE:
4 X 270 MW BHADRADRI TPS

SPECIFICATION NO. PE-TS-411-164-A001

**TECHNICAL SPECIFICATION FOR
EFFLUENT TREATMENT PLANT**

REV. NO. 00

DATE : 24/07/2017

SR. NO.	ITEM	SUPPLIERS	PLACE	REMARKS
		CORI ENGINEERS	CHENNAI	
		POLY RUBBER	MUMBAI	
		INDUSTRIAL LINING	VADODARA	
		ARUL RUBBERS	CHENNAI	
		JASMINO POLYMERTECH	TALOJA	
		WESTERN RUBBER	NAVI MUMBAI	
		ELASTOMER LINNING	AMBERNATH	
		EMKAY RUBBER	MUMBAI	
4.	AIR BLOWERS (TWIN LOBE TYPE)	SWAN PNEUMATIC	NOIDA	
		EVEREST TRANSMISSION	NEW DELHI	
		KAY INTERNATIONAL	NEW DELHI / SONEPAT	
		EVEREST BLOWER	BAHADURGARH	
		KULKARNI POWER TOOLS	KOLHAPUR/ PUNE	
5.	METERING PUMPS	VK PUMPS	NASIK	
		MILTON ROY INDIA	CHENNAI	
		SWELLORE	AHMEDABAD	
		POSITIVE METERING PUMPS	NASIK	
		METACHEM	MUMBAI	
6.	AGITATOR	REMI PEOCESS PLANT & M/C	MUMBAI	
		FIBRE & FIBRE	MUMBAI / SILVASA	
		CEECONS	CHENNAI	
		STANDARD ENGINEERS	MUMBAI	
7.	HORIZONTAL CENTRIFUGAL PUMPS	BEST AND CROMPTON ENGG LTD.	CHENNAI	
		BHARAT PUMPS & COMPRESSORS LTD	ALLAHABAD	
		FLOWMORE LTD.	GURGAON	
		JYOTI LTD.	VADODARA	
		KIRLOSKAR BROTHERS LTD	PUNE	
		WILO MATHER & PLATT PUMPS PVT. LTD.	PUNE	
		V-FLO PUMPS & SYSTEMS CO. LTD.,	BEIJING-CHINA	
		SINTECH PRECISION PRODUCT LTD.		
8.	VERTICAL CENTRIFUGAL PUMPS	WPII LIMITED	KOLKATA	
		BHARAT PUMPS & COMPRESSORS LTD	ALLAHABAD	
		FLOWMORE LTD.	GURGAON	
		JYOTI LTD.	VADODARA	
		WILO MATHER & PLATT PUMPS PVT. LTD.	PUNE	
		SINTECH PRECISION PRODUCT LTD.		
		SULZER PUMPS INDIA LTD.	THANE	
9.	SCREW PUMP	UT PUMP		
		ROTO PUMPS		



TITLE:
4 X 270 MW BHADRADRI TPS

SPECIFICATION NO. PE-TS-411-164-A001

**TECHNICAL SPECIFICATION FOR
EFFLUENT TREATMENT PLANT**

REV. NO. 00

DATE : 24/07/2017

SR. NO.	ITEM	SUPPLIERS	PLACE	REMARKS
		TUSHACO		
10.	SUBMERSIBLE PUMP	JASCO PUMP PVT. LTD.		
11.	HORIZONTAL CENTRIFUGAL PUMPS (RUBBER LINED)	KISHORE PUMPS	PUNE	
		SU MOTORS	MUMBAI	
12.	NON METALLIC (PP/FRP) HORIZONTAL CENTRIFUGAL PUMPS	ENGINEERS COMBINE	THANE	
		ANTICORROSIVE	VALSAD	
		LEAK PROOF PUMPS PVT. LTD. (RAJEDIA)	-	
13.	MISC. PUMP VERTICAL TURBINE TYPE	KBL	PUNE	
		M&P	PUNE	
		WPIL	GHAZIABAD	
		KISHORE PUMPS	PUNE	
		FLOWMORE	SAHIBABAD	
14.	BATTERY CHARGER FOR PLC	AMARA RAJA POWER SYSTEMS LIMITED	TRIPUTI	
		CHHABI ELECTRICALS PVT.LTD.	JALGAON	
		CHLORIDE POWER SYSTEMS & SOLUTIONS LIMITED	KOLKATA	
		DUBAS ENGG PVT LTD	BANGALORE	
		HBL POWER SYSTEMS LTD	HYDERABAD	
		JEMA ENERGY	SPAIN	FOR STATIC SCR TYPE FULL WAVE FULLY CONTROL TYPE
		MASS-TECH CONTROLS PVT.LTD.	MUMBAI	
		STATCON POWER CONTROLS LTD	NOIDA	
15.	UNDER BED NOZZLE	JONSONS SCREEN	AUSTRALIA/ IRELAND	
16.	COATING & WRAPPING MATERIAL TAPE	IWL LTD.	CHENNAI	
		MP TAR PRODUCT	BHILAI	
		PORWAL INDUSTRIES	RAIPUR	
		RUSTECH	KOLKATA	
		STP	JAMSHEDPUR	
17.	HEATER	ESCORTS	FARIDABAD	
		RACOLDS	FARIDABAD	
18.	CLARIFIER/ THICKENER MECHANISM	CLEAR WATER	DELHI	
		TRIVENI	NOIDA	
		PBJ ASSOCIATE	PUNE	
19.	CENTRIFUGE	HUMBOLT	-	
		HILLER	-	
20.	CAST IRON GATE/GLV/NRV/SRV	A.V. VALVES LTD	AGRA	
		ATAM VALVES PVT. LTD.	JALANDHAR	



TITLE:
4 X 270 MW BHADRADRI TPS

SPECIFICATION NO. PE-TS-411-164-A001

**TECHNICAL SPECIFICATION FOR
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SR. NO.	ITEM	SUPPLIERS	PLACE	REMARKS
		FLUIDLINE VALVES COMPANY PVT.LTD.	GHAZIABAD	
		G.M. DALUI AND SONS PVT.LTD.	HOWRAH	
		H.SARKER AND COMPANY	HOWRAH	
		LEADER VALVES LTD.	JALANDHAR	
		VENUS PUMPS AND ENGG. WORKS	KOLKATA	
21.	BALL VALVE CLASS 150	A.V. VALVES LTD	AGRA	
		AKAY INDUSTRIES PVT.LTD.	DHARWAD	
		BELGAUM AQUA VALVES PVT. LTD.	BELGAUN	
		ASIAN INDUSTRIAL VALVES & INSTRUMENTS.	CHENNAI	
		ATAM VALVES PVT. LTD.	JALANDHAR	
		DEMBLA VALVES LTD.	THANE	
		M/S GM ENGINEERING	RAJKOT	
		HAWA VALVES (INDIA) PVT. LTD.	NAVI MUMBAI	
		INTERVALVE (INDIA) LTD.	PUNE	
		LEADER VALVES LTD.	JALANDHAR	
		MICROFINISH VALVES PVT LTD.	HUBLI	
		NILON VALVES PRIVATE LIMITED	AHMEDABAD	
		SURYA VALVES AND INSTRUMENTS MFG CO.	CHENNAI	
		MEVADA ENGG. WORKS PVT. LTD		
		UNIFLOW	CHENNAI	
		VALTECH INDUSTRIES	MUMBAI	
		VAAS AUTOMATION PVT. LTD.	NEW DELHI	
		WEIR BDK VALVES- A UNIT OF WEIR INDIA PVT. LTD.	NEW DELHI	
22.	ELECTRIC MOTOR	CROMPTON GREAVES	AHMEDNAGAR	
		LAXMI HYDRAULICS PVT. LTD	BANGALORE / HUBLI	
		RAJINDRA ELECT INDUSTRIES	FARIDABAD / BANGALORE	
		GE-POWER		
		BHARAT BIJLEE	MUMBAI	
		SIEMENS	MUMBAI	
		NGEF	BANGALORE	
		KIRLOSKAR ELECTRIC CO LTD.		
		ASEA BROWN BOVERI		
		MARATHON	KOLKATA	
23.	BUTTER-FLY VALVE	ADVANCE VALVES PVT. LTD.	NOIDA	
		FLUIDLINE VALVES COMPANY PVT.LTD.	GHAZIABAD	
		INSTRUMENTATION LTD.	PALAKKAD	
		INTERVALVE (INDIA) LTD.	PUNE	
		R AND D MULTIPLES (METAL CAST) PVT LTD	MUMBAI	
		SURYA VALVES AND INSTRUMENTS MFG	CHENNAI	



TITLE:
4 X 270 MW BHADRADRI TPS

SPECIFICATION NO. PE-TS-411-164-A001

**TECHNICAL SPECIFICATION FOR
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DATE : 24/07/2017

SR. NO.	ITEM	SUPPLIERS	PLACE	REMARKS
		CO.		
		PENTAIR VALVES AND CONTROLS INDIA PRIVATE LIMITED	NAVI MUMBAI	
		UPADHAYA VALVES MANUFACTURERS PRIVATE LIMITED,	KOLKATA	
		VENUS PUMPS AND ENGG. WORKS	KOLKATA	
		WEIR BDK VALVES- A UNIT OF WEIR INDIA PVT. LTD.	NEW DELHI	
24.	DIAPHRAGM VALVE (MANUAL / PNEUMATIC) CLASS 150	WEIR BDK	HUBLI	
		CRANE FLOW PROCESS	SATARA	
		PROCON	MUMBAI	
		MAJESTIC VALVES (LABLINE)	-	
		HAWA ENGINEERS	AHMEDABAD	
25.	DUAL PLATE CHECK VALVES	ADVANCE VALVES PVT. LTD.	NOIDA	
		FLUIDLINE VALVES COMPANY PVT.LTD.	GHAZIABAD	1. DUAL PLATE CHECK VALVE CI - CLASS 150 & UP TO 600NB, 2. DUAL PLATE CHECK VALVE CCS - CLASS 150 & UP TO 500NB
		R AND D MULTIPLES (METAL CAST) PVT LTD	MUMBAI	
		VENUS PUMPS AND ENGG. WORKS	KOLKATA	CI ,CCS & STAINLESS STEEL SPRING ASSISTED DUAL PLATE CHECK VALVES UPTO 700 NB AND 150 CLASS RATING.
26.	Y-TYPE STRAINER / STRAINER (WATER SERVICE)	OTOKLIN GLOBAL BUSINESS LIMITED	MUMBAI	
		GRAND PRIX	NEW DELHI	
		JAYPEE	NEW DELHI	
		GREAVES COTTON	MUMBAI	
		MULTITEX FILTRATION ENGINEERS LIMITED,	NEW DELHI / NOIDA	
		FILTRATION ENGINEERS (I) PVT. LTD	MUMBAI	
		BOMBAY CHEMICAL EQUIPMENT'S		
		FLUIDNYE	-	
		SUNGOV ENGINEERING PVT. LTD.	DELHI	
		GRAND PRIX	FARIDABAD	



TITLE:
4 X 270 MW BHADRADRI TPS

SPECIFICATION NO. PE-TS-411-164-A001

**TECHNICAL SPECIFICATION FOR
EFFLUENT TREATMENT PLANT**

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DATE : 24/07/2017

SR. NO.	ITEM	SUPPLIERS	PLACE	REMARKS
		JAYPEE INDUSTRIES PVT. LTD.	DELHI	
		BHATIA ENGINEERING CO.	DELHI	
27.	RUBBER FLAP TYPE CHECK VALVES	ASHVIK VALVES	-	
		FLOW WAY VALVES	-	
		BDK	-	
		MAJESTIC VALVES (LABLINE INST)	-	
		ADVANCE VALVES	-	
28.	SOLENOID VALVES	ROTEX	-	
		AVCON	-	
29.	PRESSURE GAUGE/ DIFFERENTIAL PRESSURE GAUGE	A.N. INSTRUMENTS PVT. LTD.	KOLKATA	
		ASHCROFT INDIA PVT LTD.	GUJARAT	
		BOSE PANDA INSTRUMENTS PVT.LTD.	KOLKATA	
		FORBES MARSHALL (HYD) LTD.	HYDERABAD	
		GAUGE BOURDON INDIA PVT. LTD.	MUMBAI	
		H.GURU INDUSTRIES	KOLKATA	
		H.GURU INSTRUMENTS (SOUTH INDIA) P. LTD	BANGALORE	
		BAUMER TECHNOLOGIES INDIA PVT. LTD.	MUMBAI	
30.	CHAIN PULLEY BLOCK	ARMSEL MHE PVT. LTD	BANGALORE	
		CENTURY CRANE ENGINEERS PVT. LTD.	FARIDABAD	
		HERCULES HOISTS LTD.	RAIGAD	
		LIFTING EQUIPMENTS AND ACCESSORIES	DELHI	
		TUOBRO FURGUSON (INDIA) PVT LTD	KOLKATA	UPTO 10 TONNE.
		TRACTEL TIRFOR INDIA PVT. LTD.	FARIDABAD	
		TECHNO INDUSTRIES	AHMEDABAD	
		ARMSEL MHE PVT. LTD	BANGALORE	
		ALPHA SERVICES	BHIWADI	
		CONSOLIDATED HOISTS PVT LTD	PUNE	UPTO 20 TONNES
		CENTURY CRANE ENGINEERS PVT. LTD.	FARIDABAD	
		EDDY CRANES PVT. LTD.	MUMBAI	CAPACITY UPTO 10 TONS. BOIS BHEL APP.SUB- VENDORS.
		GRIP ENGINEERS PVT. LTD.,	FARIDABAD,	
		GLOBAL TECHNOLOGIES	HYDERABAD	
		HERCULES HOISTS LTD.	RAIGAD	
		LIFTING EQUIPMENTS AND ACCESSORIES	DELHI	
		MANGLA HOISTS PVT LTD	NEW DELHI	
		MEEKA MACHINERY PVT. LTD.	AHMEDABAD	



TITLE:
4 X 270 MW BHADRADRI TPS

SPECIFICATION NO. PE-TS-411-164-A001

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SR. NO.	ITEM	SUPPLIERS	PLACE	REMARKS
		REVA INDUSTRIES LTD.	FARIDABAD	UPTO 25.0 T CAPACITY.
		ROCKWELL HOISTO CRANES PVT. LTD.	BAHADURGARH	
		SAFEX ENERGY PVT. LTD.	AHMEDABAD	
		TUOBRO FURGUSON (INDIA) PVT LTD	KOLKATA	UPTO 15 TONNES.
		TECHNO INDUSTRIES	AHMEDABAD	
31.	ELECTRIC HOIST	ARMSEL MHE PVT. LTD	BANGALORE	
		ALPHA SERVICES	BHIWADI	
		CONSOLIDATED HOISTS PVT LTD	PUNE	UPTO 20 TONNES
		CENTURY CRANE ENGINEERS PVT. LTD.	FARIDABAD	
		EDDY CRANES PVT. LTD.	MUMBAI	CAPACITY UPTO 10 TONS. BOIS BHEL APP.SUB-VENDORS.
		GRIP ENGINEERS PVT. LTD.,	FARIDABAD,	
		GLOBAL TECHNOLOGIES	HYDERABAD	
		HERCULES HOISTS LTD.	RAIGAD	
		LIFTING EQUIPMENTS AND ACCESSORIES	DELHI	
		MANGLA HOISTS PVT LTD	NEW DELHI	
		MEEKA MACHINERY PVT. LTD.	AHMEDABAD	
		REVA INDUSTRIES LTD.	FARIDABAD	UPTO 25.0 T CAPACITY.
		ROCKWELL HOISTO CRANES PVT. LTD.	BAHADURGARH	
		SAFEX ENERGY PVT. LTD.	AHMEDABAD	
		TUOBRO FURGUSON (INDIA) PVT LTD	KOLKATA	UPTO 15 TONNES.
		TECHNO INDUSTRIES	AHMEDABAD	
32.	CONTROL VALVE	SPX CORPORATION, USA	AHMEDABAD	
		CONTROL COMPONENT INC.	CALIFORNIA	
		DRESSER VALVE INDIA PVT. LTD	COIMBATORE	
		DAUME REGELARMATUREN GMBH,	GERMANY	
		EMERSON PROCESS MANAGEMENT CHENNAI LIMITED	CHENNAI	
		WEIR VALVES & CONTROLS UK LTD.	U.K	
		HOLTER REGELARMATUREN GMBH & CO.KG	GERMANY	
		INSTRUMENTATION LTD.	KERALA	
		KOSO INDIA PRIVATE LIMITED,	NASHIK	
		LESLIE CONTROLS, INC	USA	
		MIL CONTROLS LTD.	KERALA	
		METSO SINGAPORE PTE. LTD.,	SINGAPORE	



TITLE:
4 X 270 MW BHADRADRI TPS

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**TECHNICAL SPECIFICATION FOR
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SR. NO.	ITEM	SUPPLIERS	PLACE	REMARKS
		PARCOL S.P.A	ITALY	
		R.K.CONTROL INSTRUMENTS PVT. LTD.	THANE	
		RINGO VALVULAS S.L,	SPAIN	
		SHENJIANG VALVE CO. LTD.	CHINA	
		VALVITALIA S.P.A. ,	ITALY	
		WALDEMAR PRUSS ARMATURENFABRIK GMBH	GERMANY	
33.	PRESSURE/DP/VACUUM SWITCH	INDFOSS	GHAZIABAD	
		SOR	USA	
		DRESSOR	USA	
		DELTA CONTROL	UK	
		TRAFAG	RANIPET	
		GIC(GAUGES BOURDON)	PANVEL	
		ASHCROFT INDIA PVT LTD.	USA/GERMANY	
		SWITZER	CHENNAI	
34.	TEMPERATURE GAUGE	A.N. INSTRUMENTS PVT. LTD.	KOLKATA	
		ASHCROFT INDIA PVT LTD.	GUJARAT	
		BUDENBERG GUAGE CO.LTD.	UK	
		FORBES MARSHALL (HYD) LTD.	HYDERABAD	
		GOA INSTRUMENTS INDUSTRIES PVT.LTD.,	GOA	
		GOA THERMOSTATIC INSTRUMENTS PVT.LTD.		
		GAUGE BOURDON INDIA PVT. LTD.	MUMBAI	
		H.GURU INDUSTRIES	KOLKATA	
		H.GURU INSTRUMENTS (SOUTH INDIA) P. LTD	BANGALORE	
		BAUMER TECHNOLOGIES INDIA PVT. LTD.	MUMBAI	
35.	LEVEL GAUGE (F&B, TUBULAR, REFLEX)	SBEM		
		CHEMTROL		
		PUNE TECHTROL		
		SIGMA		
		V AUTOMAT		
		GENERAL INSTRUMENTS		
36.	ROTAMETER	EUREKA INDUSTRIAL EQUIPMENTS PVT.LTD.	PUNE	
		FLOW STAR ENGINEERING PVT. LTD.,	FARIDABAD	
		FLOWTECH INSTRUMENTS SERVICRS	VADODARA	
		INSTRUMENTATION ENGINEERS PVT LTD	TELANGANA	
		SCIENTIFIC DEVICES (BOMBAY) PVT LTD,	NAVI MUMBAI	
37.	LEVEL SWITCH- CONDUCTIVITY TYPE	BLISS ANAND PVT. LTD.	GURGAON	
		FLOWTECH INSTRUMENTS SERVICRS	VADODARA	



TITLE:
4 X 270 MW BHADRADRI TPS

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SR. NO.	ITEM	SUPPLIERS	PLACE	REMARKS
		HI-TECH SYSTEMS & SERVICES LTD.	KOLKATA-	VENDOR SHALL SOURCE IMPORT CONTENTS OF LEVEL SWITCH (CONDUCTIVITY TYPE) FROM LEVELSTATE SYSTEMS LTD., UNITED KINGDOM.
		LEVCON INSTRUMENTS PVT. LTD.	KOLKATA	
		RAMAN INSTRUMENTS PVT.LTD.	MUMBAI	VENDOR SHALL SOURCE IMPORT CONTENTS OF LEVEL SWITCH (CONDUCTIVITY TYPE) FROM MOBREY MEASUREMENT , AN OPERATING UNIT OF MORBEY LTD., SLOUGH, BERKSHIRE, UNITED KINGDOM.
		SIGMA INSTRUMENTS CO.	MUMBAI	
		SOR INC.	USA	
		SAPCON INSTRUMENT PVT LTD.	INDORE	
		V. AUTOMAT & INSTRUMENTS (P) LTD.	NEW DELHI	
38.	LEVEL SWITCH (ALL TYPES)	LEVCON		
		CHEMTROLS SAMIL (INDIA) PVT LTD.		
		SWITZER		
		WAAREE (BAUMER INSTRUMENTS)		
		V AUTOMAT		
		PUNE TECHTROL		
39.	MAGNETIC FLOW METER	ABB	-	
		WAAREE (BAUMER INSTRUMENTS)	-	
		EUREKA	-	
		EMERSON	-	
		YOKOGAWA	-	
		HACH (POTENSE)	-	
		KROHNE MARSHALL	-	
40.	FLOW ELEMENT - NOZZLE	HYDROPNEUMATICS PVT. LTD.	GOA	
		INSTRUMENTATION LTD.	PALAKKAD	



TITLE:
4 X 270 MW BHADRADRI TPS

SPECIFICATION NO. PE-TS-411-164-A001

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SR. NO.	ITEM	SUPPLIERS	PLACE	REMARKS
		MICRO PRECISION PRODUCTS PVT. LTD.	FARIDABAD	
		MINCO (INDIA) FLOW ELEMENTS PVT. LTD.	GOA	
		STAR-MECH CONTROLS (I) PVT.LTD.	PUNE	
		SEIKO FLOW CONTROL GMBH	AUSTRIA	
41.	FLOW ELEMENT - ORIFICE	FLOW STAR ENGINEERING PVT. LTD.,	FARIDABAD	
		HYDROPNEUMATICS PVT. LTD.	GOA	
		INSTRUMENTATION LTD.	PALAKKAD	
		INSTRUMENTATION ENGINEERS PVT LTD	HYDERABAD	
		MICRO PRECISION PRODUCTS PVT. LTD.	FARIDABAD	
		MINCO (INDIA) PRIVATE LIMITED	GOA	
		STAR-MECH CONTROLS (I) PVT.LTD.	PUNE	
42.	FLOW TRANSMITTERS (ALL TYPES)	E & H	-	
		KHRONE MARSHALL	-	
		EMERSON	-	
		ABB	-	
		HONEYWELL	-	
		YOKOGAWA	-	
43.	LEVEL TRANSMITTERS (ALL TYPES)	EMERSON	-	
		E & H	-	
		ABB	-	
		HONEYWELL	-	
		V AUTOMAT	-	
		YOKOGAWA	-	
		SIEMENS	-	
		KROHNE MARSHALL	-	
44.	PRESSURE TRANSMITTERS (ALL TYPES)	EMERSON	USA/PAWANE	
		LAXONS AUTOMATION	DAMAN	
		YIL	BANGALORE	
		SIEMENS	THANE	
		FUJI	CHINA	
		YOKOGAWA	JAPAN	
		HONEYWELL	USA/PUNE	
45.	TEMPERATURE TRANSMITTERS	EMERSON	-	
		E & H	-	
		ABB	-	
		HONEYWELL	-	
		V AUTOMAT	-	
		YOKOGAWA	-	
		SIEMENS	-	
		FORBES MARSHALL	-	
46.	PH TRANSMITTERS	EMERSON	-	



TITLE:
4 X 270 MW BHADRADRI TPS

SPECIFICATION NO. PE-TS-411-164-A001

**TECHNICAL SPECIFICATION FOR
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DATE : 24/07/2017

SR. NO.	ITEM	SUPPLIERS	PLACE	REMARKS
		YOKOGAWA	-	
		HONEYWELL	-	
		ABB	-	
		HACH	-	
		FORBES MARSHALL	-	
47.	ANALYSERS (ALL TYPES)	ABB	-	
		EMERSON	-	
		YOKOGAWA	-	
		HONEYWELL	-	
		HACH POLYMETRON	-	
		SIEMENS	-	
		FORBES MARSHALL	-	
48.	PROGRAMMABLE LOGIC CONTROLLER	GE INTELLIGENT PLATFORMS PRIVATE LIMITED	BANGALORE	
		HONEYWELL AUTOMATION INDIA LIMITED ,	PUNE	
		ROCKWELL AUTOMATION INDIA LTD	SAHIBABAD	
		SIEMENS LIMITED	MUMBAI	
		SCHNEIDER ELECTRIC INDIA PVT.LTD.	NEW DELHI	
49.	UPS	HITACHI-HIREL	GANDHINAGAR	
		APC	BANGALORE	
		DELTA	GURGAON	
		EMERSON	MUMBAI	
		DB POWER	PUNE	
		APLAB	MUMBAI	
50.	INSTRUMENT FITTINGS	AURA INCORPORATED	NEW DELHI	
		ASTEC VALVES & FITTINGS PVT. LTD.,	MUMBAI	
		ARYA CRAFTS & ENGINEERING PVT. LTD.	MUMBAI	
		COMFIT & VALVE PVT. LTD.	GUJARAT	
		FLUIDFIT ENGINEERS PVT. LTD.	MUMBAI	
		FLUID CONTROLS PVT. LTD.	MUMBAI	
		HP VALVES & FITTINGS INDIA PVT. LTD.	CHENNAI	
		PRECISION ENGINEERING INDUSTRIES	MUMBAI	
		PANAM ENGINEERS,	MUMBAI	
		PERFECT INSTRUMENTATION CONTROL (INDIA) PVT. LTD.	MUMBAI	
		VIKAS INDUSTRIAL PRODUCTS	NOIDA	
51.	JUNCTION BOX	AJMERA INDUSTRIAL & ENGINEERING WORKS	MUMBAI	
		FLEXPRO ELECTRICALS PVT. LTD.	GUJARAT	METAL TYPE JUNCTION BOX ONLY



TITLE:
4 X 270 MW BHADRADRI TPS

SPECIFICATION NO. PE-TS-411-164-A001

**TECHNICAL SPECIFICATION FOR
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SR. NO.	ITEM	SUPPLIERS	PLACE	REMARKS
		K.S.INSTRUMENTS PVT.LTD.	BANGALORE	
		SUCHITRA INDUSTRIES	BANGALORE	
		SHRENIK & COMPANY,	AHMEDABAD	
52.	CABLE GLAND	COMET	-	
		DOWELL	-	
		CHETNA	-	
53.	CABLE LUGS	ELECTRO BILLETS	-	
		COMET	-	
		DOWELL	-	
		CHETNA	-	
54.	MS PLATES	SAIL		
		ESSAR STEEL		
		TISCO		
		RINL		
		JINDAL		
		LLOYD		
		ISPAT		
		INDIAN IRON & STEEL CO. LTD		
55.	CS PIPE (ASTM A 106 GR. B)	INDIAN SEAMLESS METAL TUBES	AHMEDABAD	UPTO 150 NB
		MAHARASHTRA SEAMLESS	RAIGAD	UPTO 350 NB
56.	MS PIPES (IS: 1239 & 3589)	SAIL	ROURKELA	
		JINDAL	GHAZIBAD/HISSAR	
		SURYA ROSHNI	BAHADUR GARH	
		TATA TUBE	JAMSHEDPUR	
		PSL	CHENNAI/VIZAG/KUTCH/DAMAN	
		LALIT PROFILE	THANE	
		SAMSHI PIPES INDUSTRIES	VADODARA	
		MUKUT PIPES	RAJPURA	
		INDUS TUBES	G B NAGAR	
		MANN IND	INDORE	
		SURENDRA ENGG	RAJPURA	
		PRATIBHA PIPES & STRUCTURE PVT LTD	THANE	
		JCO GAS PIPE	CHINDWARA	
		NUKAT TANKS AND VESSELS	TARAPUR	
		DADU PIPES	SIKRANDRABAD	
		GOOD LUCK TUBES	SIKANDRABAD	
		ADVANCE STEEL TUBES	SAHIBABAD	
		BIHAR TUBES	SIKANDRABAD	
		HI TECH PIPES	SIKANDRABAD	



TITLE:
4 X 270 MW BHADRADRI TPS

SPECIFICATION NO. PE-TS-411-164-A001

**TECHNICAL SPECIFICATION FOR
EFFLUENT TREATMENT PLANT**

REV. NO. 00

DATE : 24/07/2017

SR. NO.	ITEM	SUPPLIERS	PLACE	REMARKS
		RATNAMANI	KUTCH/AHMEDABAD/CHHATRAL	
		MAHARASHTRA SEAMLESS	RAIGAD	
		WELSPUN	ANJAR/BHARUCH	
57.	SS PIPES / TUBES	APEX TUBES	BEHROR (ALWAR)	
		RATNAMANI	CHATTRAL	
		REMI	TARAPUR	
		PRAKASH STEELAGE	-	
58.	POWER/CONTROL/INSTRUMENT CABLE	CORDS CABLE	BHIWADI	
		RADIANT CABLES	HYDERABAD	
		POLYCAB	DAMAN	
		KEI	BHIWADI	
		NICCO	KOLKATA	
		RAVIN CABLES	PUNE	
		INCAB	PUNE	
		HVPL	FARIDABAD	
		TORRENT CABLE	NADIAD	
		HAVELLS	ALWAR	
		PARAMOUNT	KHUSHKHERA	
		SRI RAM CABLES	BHIWADI	
		THERMOCABLES	HYDERABAD	
		TORRENT CABLE	NADIAD	
		UNIVERSAL CABLES	SATNA	
		GEMSCAB	BHIWADI	
		DELTON	FARIDABAD	
59.	SAFETY SHOWER	UNICARE	-	
		MOHAN INDUSTRIES	-	
		SUPER SAFETY SERVICES	-	
60.	FRP TANKS & FITTINGS	GLOBAL COMPOSITE	-	
		EPP	-	
		DEEPA COMPOSITE	-	
		COROSEAL INDUSTRIES	-	
		CHEMICAL PROCESS & EQUIPMENT PVT LTD	-	
		J.R FIBRE INDUSTRIES PVT LTD	-	
		POLYPLAST	-	
61.	EJECTOR	ESSEM TECHNOLOGIES	-	
		RATNA PRASAD	-	
62.	LOCAL CONTROL PANEL	INDUSTRIAL SWITCHGEAR & CONTROL	-	
		POSITRONICS	-	
		DELTA CONTROL	-	



TITLE:
4 X 270 MW BHADRADRI TPS

**TECHNICAL SPECIFICATION FOR
EFFLUENT TREATMENT PLANT**

SPECIFICATION NO. PE-TS-411-164-A001

REV. NO. 00

DATE : 24/07/2017

SR. NO.	ITEM	SUPPLIERS	PLACE	REMARKS
		L & T	-	
		GE POWER	-	
		PYROTECH	-	
		C&S	-	
63.	TANK (FRP)	INDUSTRIAL SERVICE	KOLKATA	
		SUNRISE	BARODA	
		GANDHI & ASSOCIATES	AHMEDABAD	
		MODERN EQUIPMENTS	CHENNAI	
		EAGLE PLAST	PUNE	
		OMEGA PLAST	MUMBAI	
64.	STROKE CONTROLLER	V K PUMPS	NASIK	
		METACHEM	MUMBAI	
		SWELORE	AHMEDABAD	
		MILTON ROY INDIA	CHENNAI	
65.	SAFETY VALVES/RELIEF VALVES	METACHEM	MUMBAI	
		KEYSTONE	BARODA	
		V K PUMPS	NASIK	
		MILTON ROY	CHENNAI	
66.	DUPLEX STRAINER	JAYPEE INDUSTRIES PVT. LTD.	NEW DELHI	
		MULTITEX FILTRATION ENGINEERS LIMITED,	NEW DELHI	
		OTOKLIN GLOBAL BUSINESS LIMITED	MUMBAI	
		GRAND PRIX	FARIDABAD	
		BOMBAY CHEMICAL EQUIPMENT'S		
		SUNGOV ENGINEERING PVT. LTD.	CHENNAI	
67.	ORIFICE PLATE	MICRO PRECISION	FARIDABAD	
		INSTRUMENTAION LTD	PALGHAT	
		CARLO DYNAMICS	HYDERABAD	
68.	STEEL GATE/GLOBE/NR VALVES	A.V. VALVES LTD	AGRA	
		ATAM VALVES PVT. LTD.	JALANDHAR	(1) CARBON STEEL GATE VALVES & NON RETURN VALVES: 15 NB TO 50 NB (#800) & 65 NB TO 300 NB (#150) (2) CARBON STEEL GLOBE VALVES: 15 NB TO 50 NB (#800) & 65 NB TO 200 NB (#150)



TITLE:
4 X 270 MW BHADRADRI TPS

SPECIFICATION NO. PE-TS-411-164-A001

**TECHNICAL SPECIFICATION FOR
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DATE : 24/07/2017

SR. NO.	ITEM	SUPPLIERS	PLACE	REMARKS
		FLUIDLINE VALVES COMPANY PVT.LTD.	KAUSHAMBI	
		M/S GM ENGINEERING	RAJKOT	
		INTERVALVE (INDIA) LTD.	PUNE	A) STEEL GATE VALVES: UPTO 50NB, #800 AND 65NB TO 150NB, #150 B) STEEL GLOBE VALVES: UPTO 50NB, #800 AND 65NB TO 100NB, #150 C) SUPPLIER NOT REGISTERED FOR NR VALVES
		LEADER VALVES LTD.	JALANDHAR	
		NITON VALVE INDUSTRIES PVT LTD	MUMBAI	
		NSSL LIMITED.	NAGPUR	
		STEEL STRONG VALVES (I) PVT.LTD.,	NAVI MUMBAI	LIMITED TO RANGES & CLASSES AS AVAILABE IN VD FILE.
		VENUS PUMPS AND ENGG. WORKS	KOLKATA	CC/CSS-GATE-BBT- UPTO600NB CL UPTO300,GATE -PSBT UPTO250NB CL 1500,GLV-BBT- UPTO300NB CL UPTO600,SCNR V-BBT- UPTO600NB CL UPTO150,SCNR V-BBT- UPTO300NB CL 300,SCNRV- PSBT- UPTO150NB CL UPTO900
		VALTECH INDUSTRIES	MUMBAI	CAST CARBON & ALLOY STEEL - VALVE/RATING /SIZE- GV/150/900,GV



TITLE:
4 X 270 MW BHADRADRI TPS

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SR. NO.	ITEM	SUPPLIERS	PLACE	REMARKS
				/300/400, GV/600/300 , GV/GLV/NRV/9 00/250 , GLV/300/300,G LV/150/350/ , SCNRV/150/70 0, SCNRV/300/35 0, SCNRV/600/25 0.
		HAWA VALVES (INDIA) PVT. LTD.		
		OSWAL INDUSTRIES LIMITED		
		V.K. VALVES PVT. LTD.,	JALANDHAR	
		WEIR BDK VALVES- A UNIT OF WEIR INDIA PVT. LTD.	NEW DELHI	
69.	SLUICE GATE	H SARKAR	KOLKATA	
		JASH ENGINEERING	-	
		YASHWANT INDUSTRIES	-	
70.	3 WAY VALVE	HI TECH	AHMEDABAD	
		ADVANCE VALVES PVT.LTD	NOIDA	
		BDK	HUBLI	
		FOURESS ENGG.INDIA LTD.	MUMBAI	
		FLUIDLINEVALVES COMPANY PRIVATE LTD.,	MUMBAI	
		INSTRUMENTATION LTD.	PALAKAD	
		KIRLOSKAR BROTHERS LTD.	PUNE	
		VENUS PUMP & ENGG. WORKS	KOLKATA	
		SURYA VALVES AND INSTRUMENTS MANUFACTURING COMPANY	CHENNAI	
		STAFFORD CONTROLS LIMITED	PUNE	
		MICON VALVES (INDIA) PVT.LTD	MUMBAI	
71.	PLUG VALVE(MANUAL)	BDK	HUBLI	
		HAWA ENGINEERS / MARCK & CARE	-	
		MICON VALVES	-	
		MICON VALVES (INDIA) PVT.LTD	MUMBAI	
72.	FITTINGS (CS/SS)	M.S. FITTINGS	KOLKATA	
		METAL LLOYDS	MUMBAI	
		TRUE FORGE	FARIDABAD	
		TUBE PRODUCTS	BARODA	
		NL HAZRA	KOLKATA	
		GUJRAT INFRA PIPES	BARODA	
		EDWARDS	USA	



TITLE:
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SPECIFICATION NO. PE-TS-411-164-A001

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SR. NO.	ITEM	SUPPLIERS	PLACE	REMARKS
		PIPEFIT ENGINEERS	BARODA	
		SIDDARTH & GAUTAM	FARIDABAD	
		EBY	MUMBAI	
73.	FLANGES (SS/CS)	PRADEEP METALS LTD	MUMBAI	
		TUBE PRODUCT INCORPORATION	BARODA	
		MS FITTINGS	KOLKATA	
		HAWA ENGINEERING	-	
		ALIANCE PIPE & PLANGES	KOLKATA	
		JAI AMBE	MUMBAI	
74.	PIPE & FILLTING (PP,HDPE,PVC & CPVC)	GEROGE FISHCHER	DELHI	
		ASTROL PLYTECHINC LTD	AHMEDABAD	
		JAIN IRRIGATION	-	
		ORIPLAST	-	
75.	VALVES (GATE/GLOBE/NRV/BALL)- (PP,HDPE,PVC & CPVC)	GEROGE FISHCHER IPING SYSTEMS PVT LTD	DELHI	
		ASTROL PLYTECHINC LTD	AHMEDABAD	
		JAIN IRRIGATION	-	
		ORIPLAST	-	
76.	AIR FILTER REGULATOR	SHAVO NORGEN	-	
		PLACKA INSTRUMENTS	-	
77.	FILTER MEDIA	GLOBAL ABSORBENT	KOLKATA	
		BHARAT MINERALS		
78.	DC LEAD ACID / NI-CD BATTERIES	AMCO SAFT INDIA LTD	BANGALORE	NI-CD BATTERIES ONLY
		EXIDE INDUSTRIES LTD	NEW DELHI	LEAD ACID BATTERIES ONLY.
		HBL POWER SYSTEMS LTD	HYDERABAD	NI/CD AND TUBULAR TYPE FOR LEAD ACID
		HOPPECKE BATTERIEN GMBH & CO.KG,	GERMANY	
79.	DC LEAD ACID BATTERIES	EXIDE INDUSTRIES LTD	NEW DELHI	
		HBL POWER SYSTEMS LTD	HYDERABAD	TUBULAR TYPE
		HOPPECKE BATTERIEN GMBH & CO.KG,	GERMANY	
80.	DC NI CD BATTERIES	AMCO SAFT INDIA LTD	BANGALORE	
		HBL POWER SYSTEMS LTD	HYDERABAD	
		HOPPECKE BATTERIEN GMBH & CO.KG,	GERMANY	
81.	SIGHT FLOW INDICATORS	B.K.EQUIPMENTS PVT.LTD.	CHENNAI	
		BLISS ANAND PVT. LTD.	GURGAON	
		FLOWTECH INSTRUMENTS SERVICRS	VADODARA	
		INSTRUMENTATION ENGINEERS PVT LTD	TELANGANA	



TITLE:
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SR. NO.	ITEM	SUPPLIERS	PLACE	REMARKS
		SIGMA INSTRUMENTS CO.	MUMBAI	
		SCIENTIFIC DEVICES (BOMBAY) PVT LTD,	NAVI MUMBAI	
		TELACE EQUIPMENT PVT.LTD.	CHENNAI	
82.	PAINT	ASIAN PAINTS (I) LTD.		
		BERGER PAINTS INDIA LTD		
		GOODLASS NEROLAC		
		JENSON & NICHOLSON (I) LTD		
		CDC CARBOLINE (I) LTD.		
		SHALIMAR PAINTS LTD.		
		ADDISON PAINTS LTD		
		GRAND POLYCOAT		
		BOMBAY PAINTS		
		HEMPLE PAINTS (SINGAPORE)		
		JOTUN PAINTS		
83.	PNEUMATIC ACTUATOR	PROCON ENGINEERS	-	
		TYCO	-	
		CRANE PROCESS	-	
		BDK	-	
		INTERVALVE	-	
		BRAY CONTROL	-	
84.	MOTORISED ACTUATOR	ROTARK	-	
		AUMA	-	
		LIMITORK	-	
85.	UF MEMBRANE	DOW	-	
		HYFLUX	-	
		GE	-	
		MEMBRANE HITECH	-	
86.	RO MEMBRANE	DOW CHEMICALS – FILMYECH	USA	
		HYDRANAUTICS	USA	
		KOCH MEMBRANE- FLUID SYSTEM	USA	
		TOREY	JAPAN	
87.	RO PRESSURE TUBES (FRP)	PENTAIR WATER	GOA	

MAKES OF ELECTRIC HOIST AND CHAIN PULLEY BLOCK AS PER LIST BELOW:

Package Name	Vendor Name
ELECTRIC HOIST	Alpha Services
	CONSOLIDATED HOISTS PVT LTD
	CENTURY CRANE ENGINEERS PVT. LTD.
	EDDY CRANES PVT. LTD.
	Grip Engineers Pvt. Ltd.,
	GLOBAL TECHNOLOGIES



TITLE:
4 X 270 MW BHADRADRI TPS

SPECIFICATION NO. PE-TS-411-164-A001

**TECHNICAL SPECIFICATION FOR
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CHAIN PULLEY BLOCK	HERCULES HOISTS LTD.
	LIFTING EQUIPMENTS and ACCESSORIES
	Mangla Hoists Pvt Ltd
	REVA INDUSTRIES LTD.
	ROCKWELL HOISTO CRANES PVT. LTD.
	SAFEX ENERGY PVT. LTD.
	TUOBRO FURGUSON (INDIA) PVT LTD
	ARMSEL MHE PVT. LTD
	HERCULES HOISTS LTD.
	LIFTING EQUIPMENTS and ACCESSORIES
	TUOBRO FURGUSON (INDIA) PVT LTD
	TRACTEL TIRFOR INDIA PVT. LTD.

Note: No other make will be acceptable, until and unless specifically got approved by BHEL/Customer / Customer's consultant during detail engineering only. Acceptance/non-acceptance of same shall not have any impact on manufacturing, delivery schedule and on cost of the Electric hoists

MAKES OF SUB VENDORS ITEMS AS APPLICABLE TO ELECTRIC HOIST:

STANDARD LIST OF MAKES OF SUB-VENDOR ITEMS FOR ELECTRIC HOISTS			
S.NO.	ITEM	STANDARD MAKES	REMARKS
1	STEEL	SAIL /TISCO / JINDAL/ ESSAR	
2	HOOKS	Steel Forging & Engg. Co., Kolkata/ SIMRITI FORGING/ Karachiwala (up to 25T)	
3	GEAR COUPLINGS	ALLIANCE / FLEX-TRANS (formerly known as HICLIFF) / OEM / NUTECH/ SAHARA	
4	WIRE ROPE	USHA MARTIN / FORT WILLIAMS/ Bharat Wire Ropes.	
5	BEARINGS	SKF/ FAG/ TATA / NBC	
6	MOTORS	SIEMENS / NGEF (up to 15KW) / CROMPTON / KIRLOSKAR / BHARAT BIJLI / MARATHON/ ABB/LHP	
7	BRAKES	ELECTROMAG /SPEED-O- CONTROL / BCH (for DCEM Brakes only) / Kakku	
8	CONTACTOR	SIEMENS / L&T /SCHNEIDER (Earlier TELE MECHANIQUE) / BCH	
9	OVER LOAD RELAYS	SIEMENS / L&T / ABB / SCHNEIDER (Earlier TELE MACHANIQUE)	
10	HRC FUSES	SIEMENS / L&T/ ENGLISH ELECTRIC / GE Power / Eaton (Bussmann)/ABB	
11	ISOLATING SWITCH	SIEMENS/ L&T/ CONTROL & SWITCH GEAR/ABB	
12	SWITCH FUSE UNITS	SIEMENS/ L&T/ CONTROL & SWITCH GEAR/ ABB	
13	TIME DELAY RELAYS	SIEMENS/ L&T/ ABB/ BCH/ SCHNEIDER (Earlier TELE MACHANIQUE)	
14	TRANSFORMERS	INDCOIL / LOGICSTAT/ KAPPA / AUTOMATIC ELECTRIC / PRECISE ELECTRICALS / SILKAAN ELECTRIC MFG. CO. LTD. / SOUTHERN ELECTRIC/NEC	



TITLE:
4 X 270 MW BHADRADRI TPS

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15	CABLE LUGS (HEAVY DUTY)	DOWELLS / UML ENGINEERS, KOLKATA / JAINSON	
16	CABLES		
a)	PVC Power Cables	APAR INDUSTRIES LTD., CORDS CABLE INDUSTRIES LTD., Diamond Power Infrastructure Ltd, GOYOLINE FIBRES (INDIA) PVT.LTD, GOVIND CABLE INDUSTRIES, GUPTA POWER INFRASTRUCTURE LIMITED,, Havells India Limited, KEI INDUSTRIES LTD., KRISHNA ELECTRICAL INDUSTRIES LTD., KEC INTERNATIONAL LIMITED, MANSFIELD CABLES COMPANY LTD., NICCO CORPORATION LTD., PARAMOUNT COMMUNICATIONS LTD., POLYCAB WIRES PVT. LTD., RADIANT CORPORATION PRIVATE LIMITED, RAVIN CABLES LIMITED, SUYOG ELECTRICALS LTD., SRIRAM CABLES PVT. LTD., Scot Innovation Wires and Cables Pvt. Ltd., Sam Cables & Conductors (P) Ltd., THERMO CABLES LTD.,	
b)	PVC Control cables	Advance Cable Technologies (P) Ltd., APAR INDUSTRIES LTD., CMI LTD., CORDS CABLE INDUSTRIES LTD., CRYSTAL CABLE INDUSTRIES LTD, DELTON CABLES LTD, Diamond Power Infrastructure Ltd, ELKAY TELELINKS LTD, GEMSCAB INDUSTRIES LTD., GOVIND CABLE INDUSTRIES, GUPTA POWER INFRASTRUCTURE LIMITED,, Havells India Limited, Incom Cables (P) Ltd.,KEI INDUSTRIES LTD., KRISHNA ELECTRICAL INDUSTRIES LTD., KEC INTERNATIONAL LIMITED, MANSFIELD CABLES COMPANY LTD., NICCO CORPORATION LTD., PARAMOUNT COMMUNICATIONS LTD., POLYCAB WIRES PVT. LTD., RAVIN CABLES LIMITED, SUYOG ELECTRICALS LTD., SPECIAL CABLES PVT. LTD, Scot Innovation Wires and Cables Pvt. Ltd., Sam Cables & Conductors (P) Ltd., SPM POWER & TELECOM PVT. LTD,TORRENT CABLES LTD., THERMO CABLES LTD., TIRUPATI PLASTOMATICS PVT. LTD., UNIVERSAL CABLES LTD.	
c)	Trailing Cables	Nicco / Universal / Incab / ICL / KEI/ APAR INDUSTRIES LTD/ CMI LTD/ KEI INDUSTRIES LTD./ SUYOG ELECTRICALS LTD.	
d)	XLPE Power Cables	APAR INDUSTRIES LTD., CORDS CABLE INDUSTRIES LTD., CRYSTAL CABLE INDUSTRIES LTD, Diamond Power Infrastructure Ltd, GEMSCAB INDUSTRIES LTD., GOVIND CABLE INDUSTRIES, GUPTA POWER INFRASTRUCTURE LIMITED,, Havells India Limited, KEI INDUSTRIES LTD., KRISHNA ELECTRICAL INDUSTRIES LTD., KEC INTERNATIONAL LIMITED, MANSFIELD CABLES COMPANY LTD., PARAMOUNT COMMUNICATIONS LTD., POLYCAB WIRES PVT. LTD., RAVIN CABLES LIMITED, SUYOG ELECTRICALS LTD., SPECIAL CABLES PVT. LTD, Scot Innovation Wires and Cables Pvt. Ltd., SRIRAM CABLES PVT. LTD.,TORRENT CABLES LTD., THERMO CABLES LTD., TIRUPATI PLASTOMATICS PVT. LTD.,	



TITLE:
4 X 270 MW BHADRADRI TPS

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REV. NO. 00

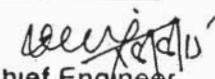
DATE : 24/07/2017

e)	XLPE Control cables	APAR INDUSTRIES LTD., CABLE CORPORATION OF INDIA LTD., CRYSTAL CABLE INDUSTRIES LTD., Diamond Power Infrastructure Ltd, GEMSCAB INDUSTRIES LTD., Havells India Limited, KEI INDUSTRIES LTD., KRISHNA ELECTRICAL INDUSTRIES LTD., KEC INTERNATIONAL LIMITED, PARAMOUNT COMMUNICATIONS LTD., POLYCAB WIRES PVT. LTD., RADIANT CORPORATION PRIVATE LIMITED, RAVIN CABLES LIMITED, SUYOG ELECTRICALS LTD., SRIRAM CABLES PVT. LTD., TORRENT CABLES LTD., UNIVERSAL CABLES LTD.	
17	Cable gland	COMMET / SUNIL&CO./ ARUP ENGINEERING / JAINSON / DOWELL	
18	PUSH BUTTONS	SIEMENS / L&T / BCH / Schneider	
19	Limit Switches	Speed-o-control / Electromag	
20	Pendent Push button station	OEM	
21	Indicating Lamps	Tecknic / BCH / Siemens / Standard	
22	MCB	MDS / Indo Copp / Standard / Siemens / L&T/ ABB/ Schneider	
23	Panels	OEM / RITTAL / PYROTECH	
24	Resistance boxes	Enapros / OEM	
25	VVVF	YASKAWA/ ABB / SIEMENS/ SCHNIEDER/ FUJI ELECTRIC/ MITSUBISHI ELECTRIC	
26	Shrouded DSL	Susheel/ Stromag	
27	LOAD CELL	IPA, Sartorius	
28	GEAR BOX	OEM/ ELECON ENGINEERS/ SHANTI GEARS/ PBL*/ NAW*/ NORD*/ SEW*/ BONGFILIOLI*	* = Applicable for Geared Motors only
29	RAIL	JSPL / SAIL	

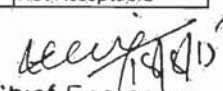
Note:

1. All the trailing cables shall be sourced from only one sub-vendor from the list.
2. No other make will be acceptable, until and unless specifically got approved by BHEL/Customer / Customer's consultant during detail engineering only. Acceptance/non-acceptance of same shall not have any impact on manufacturing, delivery schedule and on cost of the Electric hoists/ CPB

ANNEXURE -1			
Approved additional vendor list of M/s BHEL/EDN for 4x270MW Bhadradi TPS			
S.No	Item Description	Vendors	Remarks
C&I Mechanical items VENDOR LIST			
1	Air Filter Regulator	Janatics, Chennai	Not Acceptable
		SMC Pneumatics	Approved
		PARKER HANNIFIN INDIA PVT. LTD.	Approved
		Control Air, Pune	Not Acceptable
2	Bypass Rotameter	FLOW STAR ENGINEERING PVT. LTD., FARIDABAD	Approved
		FLOWTECH INSTRUMENTS SERVICES, VADODARA	Approved
		SCIENTIFIC DEVICES (BOMBAY) PVT. LTD., MUMBAI	Approved
3	CBLM Sys (Ultrasonic / Radar Type) Sensor	ENDRESS + HAUSER INDIA PVT. LTD. MUMBAI	Approved
		SIEMENS LIMITED BANGALORE	Approved
		K-TEK LONGMEADOW BUSINESS ESTATE EXT 5	Not Acceptable
		Vega, Germany	Approved
		Kronhe, Germany	Approved
		Emerson Process Management	Approved
4	CBLM Sys (Ultrasonic /Radar Type) Panel	ENDRESS + HAUSER INDIA PVT. LTD. MUMBAI	Approved
		SIEMENS LIMITED BANGALORE	Approved
		K-TEK LONGMEADOW BUSINESS ESTATE EXT 5	Not Acceptable
		Vega, India	Approved
		Forbes Marshall, Pune	Approved
		Emerson Process Management	Approved
5	Compression Fittings	PMT ENGINEERS, AHMEDABAD	Approved
6	Condensate Pots	PMT ENGINEERS, AHMEDABAD	Approved
		HP VALVES & FITTINGS (INDIA) PVT. L CHENNAI	Approved
7	Dust Density (Opacity) Monitor (Analyzer)	CODEL INTERNATIONAL LTD	Approved
		LAND INSTRUMENTS INTERNATIONAL ENGLAND (UK)	Approved
		FORBES MARSHALL CODEL PVT. LTD. PIMPRI, PUNE	Approved
		SICK MAIHAK GMBH	Approved
		DURAG GMBH AND CO KG HUMBURG	Approved
		CHEMTROLS INDUSTRIES LIMITED POWAI, MUMBAI	Approved
8	Dust Density (Opacity) Monitor (panel)	MARVEL ENGG COMPANY CHENNAI	Approved
		FORBES MARSHALL CODEL PVT. LTD. PIMPRI, PUNE	Approved
		DURAG INDIA INSTRUMENTATION PRIVATE	Approved
		CHEMTROLS INDUSTRIES LIMITED POWAI, MUMBAI	Approved
9	Erection Material	MET LOK HYDRO PNEUMATICS PVT LTD, GUJARAT	Approved
		PMT ENGINEERS, AHMEDABAD	Approved
10	GI Pipes	BHUWALKA PIPES LIMITED	Approved


 Chief Engineer
 Thermal Projects Construction
 TSGENCO, Vidyut Soudha,
 Khairatabad, Hyderabad-82

S.No	Item Description	Vendors	Remarks
11	Impact Head Type Element	VERIS INC	Not Acceptable
		STAR-MECH.CONTROLS (I) PVT.LTD.	Approved
12	Impulse Pipes(Alloy steel)	INDIAN SEAMLESS METAL TUBES LTD BANGALORE	Approved
13	Instrument Valve	FLUID CONTROLS PVT LTD, PUNE	Approved
		PMT Engineers, Ahmedabad	Approved
14	Level Switch Capacitance Type	NIVO CONTROLS PVT LTD	Approved
15	Magnetic Flow Meter	ABB LTD PEENYA, BANGALORE.	Approved
		ENDRESS + HAUSER INDIA PVT. LTD. MUMBAI	Approved
16	C&I Lab Items Mechanical (pneumatic)	BHEL-EDN Approved sources	BHEL shall submit item wise vendor list for review & approval.
17	Flow Element	EMERSON PROCESS MANAGEMENT KUMARAPARK(WEST), BANGALORE	Approved
		MICRO PRECISION PRODUCTS PVT LTD FARIDABAD	Approved
		INSTRUMENTATION LIMITED PALGHAT	Approved
		ENGINEERING SPECIALITIES PVT. LTD.	Approved
18	Oxygen Analyser (LT)Panel & accessories	CHEMTROLS POWAI, MUMBAI	Approved
19	Socket Weld Fittings	PMT ENGINEERS,AHMEDABAD	Approved
20	Structural Steel	NANDAN STEELS & POWER LTD.	Not Acceptable
21	Steam and Water analysis Sys(Analyzer)	ENDRESS + HAUSER INDIA PVT. LTD. MUMBAI	Approved
		SWAN Analytical Instruments, Switzerland	Not Acceptable
		YOKOGAWA INDIA LIMITED BANGALORE	Not Acceptable
22	Steam and Water analysis System(Panel)	ENDRESS + HAUSER INDIA PVT. LTD. MUMBAI	Approved
23	Temperature Elements	EXOTHERM INSTRUMENTS ,THANE	Approved
		Toshniwal Industries Pvt Ltd, Ajmer	Approved
24	Valve Manifolds	MICRO PRECISION PRODUCTS PVT LTD FARIDABAD	Approved
		FLUID CONTROLS LIMITED ,PUNE	Approved
		PMT ENGINEERS,AHMEDABAD	Approved
25	Mercury analyser	THERMOFISHER USA/ THERMOFISHER, Mumbai.	Approved
		SICK, Germany/ Chemtrols, India.	Approved
		Mercury Instruments. Germany/ AICPL, Kota	Not Acceptable
		DURAG, Germany / DURAG, Bangalore.	Approved
26	C&I Laboratory Furniture	PYROTECH WORKSPACE SOLUTIONS PVT. L	Approved
		GODREJ AND BOYCE MANUFACTURING CO.	Approved
		COSMOS MEDIA PRODUCTS PVT. LTD.	Approved
		OTS OFFICETECH SYSTEMS (P) LTD	Not Acceptable
		HARMONY SYSTEMS	Not Acceptable
		FEATHERLITE PRODUCTS PVT. LTD.	Approved
		ADARSHA CONTROL SYSTEMS PVT. LTD.	Not Acceptable


 Chief Engineer
 Thermal Projects Construction
 TSGENCO, Vidyut Soudha,
 Khairatabad, Hyderabad-82

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S.No	Item Description	Vendors	Remarks
C&I Electrical items VENDOR LIST			
27	Junction Box (FRP)	M/S Devi polymer, Chennai	Approved
		M/S Baliga Lighting, Chennai	Approved
28	Junction Box (Metal)	M/S Gee Dee Packages, Mysore	Not Acceptable
		M/S Baliga Lighting, Chennai	Approved
29	Electronic Transmitter - Pr. / Diff. Pr.	M/s HONEYWELL, USA/PUNE	Approved
30	Level Transmitter (Displacement type)	M/s V.AUTOMAT, India	Approved
		M/s LEVCON INSTRUMENTS, INDIA	Approved
		M/s E&H, GERMANY/INDIA	Approved
31	Level Transmitter (RADAR type)	M/s KROHNE MARSHALL	Approved
		M/s HONEYWELL, USA/INDIA	Approved
		M/s VEGA, GERMANY	Approved
		M/s P&F, INDIA	Approved
32	HART Communicator	M/s FUJI, JAPAN	Approved
		M/s GE INDIA INDUSTRIAL PVT. LTD./INDIA	Approved
		M/s FLUKE CORPORATION / USA	Approved
33	Cable Glands	M/s MJ TRADERS, BANGALORE	Approved
		M/s TRINITY TOUCH, DELHI	Approved
		M/s STANDARD METAL, MUMBAI	Approved
34	Cable Lugs	M/s MJ TRADERS, BANGALORE	Approved
		M/s TRINITY TOUCH, DELHI	Approved
		M/s STANDARD METAL, MUMBAI	Approved
		M/s CHETNA ENGINEERING COMPANY, NASIK	Approved
		M/s DOWELLS, MUMBAI	Approved
		M/s BILLETS ELECTRO WERKE, MUMBAI (3D, UMBERGAON)	Approved
35	Cable trays	M/s RATAN PROJECTS & ENGG COMPANY PRIVATE LTD, KOLKATA	Approved
		M/s SILVERLINE POWER INFRASTRUCTURE (P) LTD, VODADARA	Approved
		M/s INDUSTRIAL PERFORATIONS, KOLKATA	Approved
		M/s INDIANA GRATINGS PVT LTD, PUNE	Approved
		M/s STEELITE ENGG, MUMBAI	Approved
		M/s AMTECH ENGINEERING, PUNE	Approved
36	Instrumentation, Control & Compensating / Thermocouple extension cables (PVC, FRILS Type)	M/s INAR PROFILES, VIZAG	Approved
		RJ industrial corporation, Uttarkhand	Not Acceptable
		RR Kabel Ltd, Mumbai	Not Acceptable
		Apar industries, Bangalore	Not Acceptable
		Gemscab industries Ltd, Bhiwadi	Approved
		NICCO cables, kolkata	Approved
		Lapp india pvt ltd, Bangalore	Not Acceptable
		Associated cables pvt ltd, Mumbai	Approved
		Industrial cables ltd, punjab	Not Acceptable
		KEC international ltd, Bangalore	Not Acceptable
		RJR industries, Bangalore	Not Acceptable

[Signature]
 Chief Engineer
 Thermal Projects Construction
 TSGENCO, Vidyut Soudha,
 Khairatabad, Hyderabad-82

S.No	Item Description	Vendors	Remarks
		Radiant cables,Hydrabad	Not Acceptable
		Govind cable industries, kolkata	Not Acceptable
		Special Cables Pvt Ltd, New Delhi	Approved
37	Level Transmitter (Ultrasonic Type)	M/s P&F,INDIA	Approved
		M/s FORBES MARSHALL	Approved
38	Lead Acid Battery (Plante type)	M/s EXIDE INDUSTRIES, KOLKATA	Approved
		M/s HOPPECKE, GERMANY	Not Acceptable
39	Master Slave Clock System	M/s SERTEL, CHENNAI	Approved
		M/s MASIBUS, GANDHINAGAR.	Approved
		M/s SANDS, CHENNAI	Approved
40	Walkie Talkie System	BHEL-EDN Approved Sources	BHEL shall submit item wise vendor list for review & approval.
41	C&I Laboratory Instruments (Electrical Package)	BHEL-EDN Approved Sources	BHEL shall submit item wise vendor list for review & approval.
HMI VENDOR LIST			
42	Wireless Communication Link	AMG SYSTEMS LTD,UK	Approved
		SHEETAL WIRELESS TECHNOLOGIES PVT LTD,PUNE	Not Acceptable
		ARYA .DELHI	Not Acceptable
		D LINK,GOA	Approved
		PYROTECH LTD , UDAIPUR	Not Acceptable
43	Mini UPS for HMI	APLAB LIMITED ,THANE	Not Acceptable
		POWERTRONIX SYSTEMS LTD.,BANGALORE.	Not Acceptable
		SCHNEIDER ELECTRIC,BANGALORE	Approved
		EMERSON NETWORK ,PUNE	Not Acceptable
44	STATION LAN EQUIPMENT	ORANGE BUSINESS SERVICES	Approved
		NETSOFT SYSTEMS & NETWORKS ,BANGALORE	Not Acceptable
		PRISHA SYSTEMS & NETWORKS PVT LTD.	Approved
		BINARY SYSTEMS PVT LTD.	Not Acceptable
		ORVA NETWORKS PVT LTD	Not Acceptable
DAVR VENDOR LIST			
45	AUX. TRANSFORMER	TRANSPower IND.	Approved
		KALPA ELECTRICALS PVT LTD	Approved
46	PANEL METERS	AUTOMATIC ELECTRIC PVT LTD.	Approved
		MECO INSTRUMENTS	Approved
47	INDICATING LAMPS / PUSH BUTTONS	TEKNIC	Approved
		SIEMENS	Approved
		ABB(I) LTD.	Approved
		GE POWER CONTROLS	Approved

[Signature]
Chief Engineer

Thermal Projects Construction
TSGENCO, Vidyut Soudha,
Khairatabad, Hyderabad-82

S.No	Item Description	Vendors	Remarks
48	TIER FAN	HICOOL	Approved
		EBM NADI	Approved
		SUNON	Approved
		MICROINSTRUMENTS	Approved
49	CURRENT TRANSFORMERS (INCLUDING CONDUCTION MONITORING CT's)	KAPPA ELECTRICALS	Approved
		INSTRANS ENGG. & MFG. PVT LTD.	Approved
		INTRA VIDYUT LTD.	Approved
		PARAS POWER ENGG.LTD.,	Approved
		V&C, GERMANY	Approved
		KALPA ELECTRICAL PVT LTD.	Approved
50	SHUNT	MECO INSTRUMENTS (GOLIYA ENTERPRISES PVT. LTD)	Approved
		IMP POWER LTD.	Approved
		AUTOMATIC ELECTRIC PVT LTD.	Approved
51	AUX. CONTACTOR	SIEMENS (I) LTD.	Approved
		ABB (I) LTD.	Approved
52	SEMICONDUCTOR FUSE	COOPER BUSSMANN DENMARK	Approved
		MERSEN (FORMERLY FERRAZ SHAWMUT FRANCE)	Approved
53	ELECTRONIC MODULE	BHEL-EDN BANGALORE	Approved
54	MCBS	ABB LTD.	Approved
		SIEMENS AG/SIEMENS (I) LTD.	Approved
		INDO KOPP LEGRAND	Approved
		MDS LOAD CONTACT	Approved
		MERLIN GERIN	Approved
		SCHNEIDER ELECTRIC	Approved
55	FIELD BREAKER	MERSON (FORMERLY KNOWN AS LENOIR ELECTRICALS, FRANCE)	Approved
		ABB CONTROLS,FRANCE	Approved
56	EXCITER FIELD DISCHARGE RESISTOR	AMP CONTROL EQPT. PVT LTD.	Approved
		OHMARK CONTROLS PVT LTD.	Approved
57	TRANSDUCER	ELSTER METERING(FORMERLY ABB)	Approved
		SOUTHERN TRANSDUCERS CHENNAI	Approved
		RISHABH	Approved
58	AUXILIARY RELAY	JYOTHI LTD. BARODA	Approved
		GUARDIAN CONTROLS	Approved

[Signature]
 Chief Engineer
 Thermal Projects Construction
 TSGENCO, Vidyut Soudha,
 Khairatabad, Hyderabad-82

S.No	Item Description	Vendors	Remarks
59	ROTARY SWITCHES	KAYCEE IND	Approved
		KRAUS & NAIMER	Approved
60	HRC FUSES WITH TRIP INDICATOR, FUSE BASE ISOLATOR	FERRAZ SHAWMUT	Approved
		COOPER BUSSMANN INDIA LTD.	Approved
		GE POWER CONTROLS LTD	Approved
		SIEMENS INDIA	Approved
61	OFFLOAD ISOLATOR	CONTROL & SWITCH GEAR, NOIDA	Approved
		ABB, INDIA	Approved
62	FERRITE CORE REACTOR	MAGNETICS INTERNATIONAL. USA	Approved
63	POWER CABLES AND CONTROL CABLES	UNIVERSAL CABLES	Approved
		DELTON CABLES	Approved
		RADIANT CABLES	Not Acceptable
		INDUSTRIAL CABLES LTD	Not Acceptable
		NICCO CORPORATION LTD.	Approved
		TORRENT CABLES LTD	Not Acceptable
		GEMSCAB INDUSTRIES LTD	Not Acceptable
		POLYCAB WIRES PVT. LTD	Approved
		RPG CABLES	Not Acceptable
		TECHNO CABLES	Approved
		FORT GLASTER INDUSTRIES LTD.	Approved
		RELIANCE ENGINEERS	Not Acceptable
		INCAB INDUSTRIES LTD	Not Acceptable
		PARAMOUNT CABLE CORPORATION	Approved
		KEI INDUSTRIES LTD, BHIWADI	Approved
64	INDUSTRIAL PC	M/S ADVANTECH, TAIWAN	Approved
65	ETHERNET SWITCHES	MOXA	Not Acceptable
		CISCO	Approved
		HIRSCHMAN	Approved
		N-TRON	Not Acceptable

[Signature]
 Chief Engineer
 Thermal Projects Construction
 TSGENCO, Vidyut Soudha,
 Khairatabad, Hyderabad-52

S.No	Item Description	Vendors	Remarks
Desk			
66	Electrical Analog Meter	AUTOMATIC ELECTRIC, MUMBAI	Approved
		RISHAB, NASHIK	Approved
		MECO, MUMBAI	Approved
		ENERCON, BANGALORE	Approved
67	Mosaic Grid Components	PRO-PLAN, GERMANY [Earlier Boyko Strey]	Approved
		SYMO, SWITZERLAND	Approved
		TEW GERMANY [Earlier Subklew]	Approved
68	Mosaic Mountable Moving Coil indicators	GOSSEN, GERMANY	Approved
		WEIGEL, GERMANY	Approved
		SAMSON ELECTRONIC GMBH	Approved
69	Mosaic Mountable Digital Indicators (48 X 24mm)	GOSSEN, GERMANY	Approved
		WEIGEL, GERMANY	Approved
		SAMSON ELECTRONIC GMBH	Approved
70	Transducers	ADERT, PUNE	Approved
		AUTOMATIC ELECTRIC, MUMBAI	Approved
		MECO, MUMBAI	Approved
		SOUTHERN TRANSDUCERS, CHENNAI	Approved
71	UCP /ECP /Control desk (Mosaic Grid based panels)	CHEMIN CONTROLS, PONDICHERRY	Approved
		IL, KOTA	Approved
		KHODAY CONTROL SYSTEMS, BANGALORE	Not Acceptable
		MODAYIL PROPERTIES, NANJANGUD	Not Acceptable
		PYROTECH, UDAIPUR	Approved
72	Selector Switches	L&T	Approved
		SALZER	Approved
		KAYCEE	Approved

[Signature]
Chief Engineer

Thermal Projects Construction
TSGENCO, Vidyut Soudha,
Khairatabad, Hyderabad-82

परियोजना
इंजीनियरिंग
प्रबंधन
Project Engineering
Management

भारतहेवीइलेक्ट्रिकल्सलिमिटेड
(भारतसरकारकाउपक्रम)
Bharat Heavy Electricals Limited
(A Govt. of India Undertaking)



Date : 20/10/15
Our ref: PS-PEM/PG-II/TSGENCO/KOTH/023

To,
The Chief Engineer
Thermal Projects Construction
TSGENCO, Vidyut Soudha,
Khalratatabad,
Hyderabad - 500082.

Sub: 1X800MW Kothagudem TPS- Approval of vendors for PEM package (CONTROL VALVES).

Dear Sir,

With reference to TSGENCO letter CEE/111/KTPS-VII(1X800MW)/Vendors/D.No.15/15, Dt:09/04/2015 of Kothagudem TPS, approved vendor list of BHEL was received from TSGENCO. However, we would like to draw your attention towards additional vendor approval of Pre-Treatment Plant for which Technical bid has already been opened.

It may please be noted that as per TSGENCO letter CEE/111/KTPS-VII(1X800MW)/Vendors/D.No.15/15, Dt:09/04/2015, the following 15 vendors were approved by TSGENCO:

1. EMERSON PROCESS MANAGEMENT LTD., CHENNAI
2. INSTRUMENTATION LTD.
3. CONTROL COMPONENT INC.
4. DRESSER VALVE INDIA PVT. LTD.
5. FORBES MARSHALL ARCA PVT. LTD.
6. KOSO INDIA PVT. LTD.
7. LESLIE CONTROLS INC.
8. MIL CONTROLS LTD.
9. DAUME REGELARMATUREN GMBH
10. SEVERN GLOCON INDIA PVT. LTD.
11. BTG KALLE INVENTING AB
12. DRESSER PRODUITS INDUSTRIES SAS
13. FISHER SANMAR LTD.
14. FLOWSERVE INDIA CONTROLS PVT. LTD.
15. KOSO FLUID CONTROLS PVT. LTD. PALLAKAD

However, we have received offers from following 6 vendors against Open tender Enquiry, out of which 4 vendors are Customer approved.

Sl. No.	Vendor Name	Place of vendor	BHEL PEM approved	Customer approved	Remarks
1	MIL CONTROLS LTD.	KERALA	Y	Y	
2	INSTRUMENTATION LTD.	KERALA	Y	Y	
3	EMERSON PROCESS MANAGEMENT LTD., CHENNAI	Chennai	Y	Y	



कृपयाप्रेषितकरे :
बीएचईएल, पीएस-पीएम
पीपीआई भवन
प्लॉट नं २५, सेक्टर १६ ए
नोएडा - २०१ ३०१ उ प्र
भारत

Please reply to :
BHEL, PS-PEM,
PPEI Building,
Plot No.25, Sector 16A,
Noida-201301 (U.P.)
INDIA

फ़ोन Phone No:
91-120 - 436 8762

पंजीकृतकार्यालय
बीएचईएल हाउस
सीरी फोर्ट
नयी दिल्ली - ११० ०४९
भारत

Registered Office :
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Siri Fort,
New Delhi-110049
INDIA