

**TITLE****4 X 270 MW BHADRADRI TPS
TECHNICAL SPECIFICATION FOR
SEWAGE TREATMENT PLANT****SPECIFICATION NO.**

PE-TS-411-673A-A001

VOLUME: II B

REV 00

SHEET 1 of 7

LIST OF MANDATORY SPARES FOR STP**1. Vertical Sump Pumps – (For each Type and Size)**

Sl. No.	Name of Items	Unit	QUANTITY
i.	Complete Casing including suction (if applicable) bell	Set	1
ii.	Impeller	Set	1
iii.	Impeller key	Number	1
iv.	Wearing rings (Impeller & Casing ; as applicable)	Set	2
v.	Impeller Shaft, line shaft and head shaft	Set	1
vi.	Shaft Sleeves	Set	2
vii.	Stuffing box	Set	1
viii.	Coupling between Pump & motor, bushes, pins with all fasteners & coupling Guards.	Set	1
ix.	Line Shaft Couplings (if applicable)	Set	1
x.	Impeller, Line and Head shaft bearings (as applicable)	Set	1
xi.	Gland Packing & Gland Assembly	Set	1
xii.	Mechanical seal as applicable	Set	1

2. Horizontal Centrifugal Pumps (For each Type and Size)

Sl. No.	Name of Items	Unit	QUANTITY
i.	Impeller for each type	Set	1
ii.	Wearing rings – Impeller for each type (if applicable)	Set	1
iii.	Wearing rings – Casing for each type (if applicable)	Set	1
iv.	Shaft for each type	Set	1
v.	Shaft Sleeves for each type	Set	1
vi.	Stuffing box for each type	Set	1
vii.	Coupling between Pump & motor, bushes, pins with all fasteners & coupling Guards	Set	1
viii.	Pump bearings for each type	Set	1
ix.	Gland Packing & Gland Assembly for each type	Set	1
x.	Mechanical seal as applicable	Set	1
xi.	Impeller key	Number	1

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PE-TS-411-673A-A001

VOLUME: II B

REV 00

SHEET 2 of 7

3. AGITATORS (FOR EACH TANK AS APPLICABLE)

Sl. No.	Name of Items	Unit	QUANTITY
i.	Agitator Assembly with Gear Box	Set	1

4. MOTOR

Sl. No.	Name of Items	Unit	QUANTITY
i.	Motor bearing for each type of pump	Set	1

5. VALVES AND PIPING

Sl. No.	Name of Items	QUANTITY
i.	Piping valves & traps - Complete assembly	5% or min. 1 no. (whichever is more) for each size, type & rating for total population

6. MANDATORY SPARES FOR CONTROL SYSTEM AND MEASURING INSTRUMENTS

Sl. No.	Name of Items	QUANTITY
6.1	Mandatory Spares for Temperature Elements and Thermowells	
6.1.1	Thermocouple / RTD elements (10% of each type and length of elements, or a minimum of one number, whichever is more.)	2 Lot
6.1.2	Thermowells for each type of temperature sensors (10% or a minimum of one for each type, whichever is more.)	2 Lot
6.2	Mandatory Spares for Electronic Transmitters (for pressure, DP, Flow, level, Temperature) and Electrical Transducers.	
6.2.1	Transmitters and Electrical Transducers (10% of total number of offered for each model and type for the project or a minimum of one number, whichever is more)	2 Lot
6.3	Mandatory spares for local gauges/switch (for Pressure, DP, Temperature, Flow, level, etc.)	
6.3.1	Local gauges/ Switch (for Pressure, DP, Temperature, Flow, level, etc.) (10% of total number of instruments offered for each model and type for the project or a minimum of one number, whichever is more.)	2 Lot
6.4	Programmable Logical Control (PLC)	
6.4.1	Function controller and control modules (10% of number for each type or minimum of 4 number for each type whichever is high.)	2 Lot
6.4.2	Process I/O cards and drive modules (10% of the number of cards offered for the project from each category.)	2 Lot
6.4.3	All other type of electronic modules like CPU of	2 Lot



TITLE

4 X 270 MW BHADRADRI TPS TECHNICAL SPECIFICATION FOR SEWAGE TREATMENT PLANT

SPECIFICATION NO.

PE-TS-411-673A-A001

VOLUME: II B

REV 00

SHEET 3 of 7

	workstation, Power supply modules, communication modules, modules for Data highway / modules for LAN, controllers not covered above (10% of each type or minimum of 2 nos. of each type whichever is more).	
6.4.4	All cards, controllers, lamp and other components used in LVS.	2 Lot (10%)
6.4.5	Control logic power supply fuses at each current rating (Three times the one hundred percent spare replacement).	2 Lot
6.4.6	Electric to pneumatic converters (10% of each type utilized with automatic control system using pneumatic drives or a minimum of one of each type, whichever is more.)	2 Lot
6.4.7	Plug-in type keyboard	2 No. of each type
6.4.8	Dot matrix Printer	2 No.
6.4.9	CRT	2 No.
6.4.10	DVDs	40 Nos.
6.4.11	Printer ribbons /inking mechanism for colour printer.	20 Nos.
6.4.12	Ribbons for dot matrix printer.	60 Nos.
6.4.13	Data highway cable with adequate connectors.	500 meters
6.4.14	Hard disc drive unit as offered for system complete with accessories.	2 No.
6.4.15	Interface cables for each type	4 Sets
6.4.16	Power supply modules of each type and rating	2 Lot (10%)
6.4.17	Interposing / coupling relays of each type.	2 Lot (5% of total quantity)
6.5	MANDATORY SPARES FOR UN-INTERRUPTIBLE POWER SUPPLY SYSTEM	
6.5.1	Fuses (3 times, the one hundred percent spare replacement fuses shall be furnished with each panel board.)	2 Lot
6.5.2	Electronic modules for UPS , Charger, static switch & stabilizer and DC power supply system with each set consisting of at least one number of each type of electronic module for inverters, chargers, static switch, stabiliser etc.	2 Set
6.5.3	Battery cells	2 Lot (10%)
6.5.4	Thyrister without heat sink	2 Lot (10%)
6.5.5	Semiconductor fuse	2 Lot (10%)
6.6	Mandatory Spares for Control Panels / Desks	
6.6.1	Crimping Pins	2 Rolls
6.6.2	Bulbs for indicating lights (Three times the one hundred percent spare replacement)	2 Lot
6.6.3	control circuit fuses of each current rating (Three times, the one hundred percent spare replacement)	2 Lot
6.6.4	Push buttons, electrical control switches and Illuminated push buttons etc	Lot (20%)

**TITLE****4 X 270 MW BHADRADRI TPS
TECHNICAL SPECIFICATION FOR
SEWAGE TREATMENT PLANT****SPECIFICATION NO.**

PE-TS-411-673A-A001

VOLUME: II B

REV 00

SHEET 4 of 7

7. Horizontal Screw Pumps (For each Type and Size)

Sl. No.	Name of Items	Unit	QUANTITY
i.	Shaft for each type	Set	1
ii.	Shaft Sleeves for each type	Set	1
iii.	Coupling between Pump & motor, bushes, pins with all fasteners & coupling Guards	Set	1
iv.	Pump bearings for each type	Set	1
v.	Gland Packing & Gland Assembly for each type	Set	1

8. Air Blower (For each Type and Size)

Sl. No.	Name of Items	Unit	QUANTITY
i.	V Belt	Set	1
ii.	Oil seal	Set	1
iii.	Filter	Set	1
iv.	Bearings for Blower	Set	1

9. LIST OF MANDATORY SPARES FOR HOIST AND CHAIN PULLEY BLOCK

Sl. No.	Name of Items	QUANTITY
ELECTRIC HOIST (for each type and rating, hoists)		
1.	Mechanical Items	
1.1	Bearings for long travel wheels	2 sets
1.2	Bearings for gear boxes for each type of hoist	2 sets
1.3	Break liners for all the brakes	100% of total population of each type & size
1.4	Oil seals	100% of total population of each type, size rating
1.5	Brake springs for all brakes	-do-
1.6	Wire ropes for hooks	100% installed on each crane and hoist
1.7	Solenoid coils for brakes	2 sets
1.8	Overload relay for motors	2 Nos.
1.9	Limit switches for hoists and travel mechanisms	2 sets
1.10	Spare motors for hoists	2 Nos.
1.11	Long travel machinery	
1.12	i. Gear wheel	1 set
1.13	ii. Internal clip	2 Nos.
1.14	iii. Pinion	1 No.



TITLE

4 X 270 MW BHADRADRI TPS TECHNICAL SPECIFICATION FOR SEWAGE TREATMENT PLANT

SPECIFICATION NO.

PE-TS-411-673A-A001

VOLUME: II B

REV 00

SHEET 5 of 7

2.	Electrical Items	
2.1	415 Volt Motor (Upto 30 KW Rating)	
2.2	Driving End & Non-Driving End Bearing	3 Set for each type and rating of Motor
2.3	Cooling Fan	2 Nos. for each type and rating of Motor
2.4	Motor Terminal Block	5 Nos. for each type and rating of Motor
2.5	Complete Set of Coupling	1 Set of each application
3.	C&I Items	
3.1	PLC	NA
3.2	Back-up panel mounted devices (Selector switches/ Push buttons/ Indicators etc.	5% of installed capacity
3.3	Lamps/ LEDs	10% of the total quantity
3.4	Blank Tiles	10% of installed capacity
3.5	MCBs	10% of each type & rating
3.6	Fuses/ Fuse holder	10% of each type & rating
Chain pulley block (for each capacity and type of chain pulley blocks)		
i	Load chain wheel	1 No.
ii	Load chain stripping fork	5 Nos.
iii	Hand chain wheel	2 Nos.
iv	Ratchet pawl	1 No.
v	Locking ratchet wheel	2 Nos.
vi	Guide roller	2 Nos.
vii	Brake disc	2 Nos.
NOTES FOR ELECTRIC HOIST AND CHAIN PULLEY BLOCK		
1. "One (1) Set" and "One (1) set of each type & size" is defined as 100% requirement for one crane/hoist for the entire hoists of similar size & capacity. If two (2) cranes/hoist are of same capacity, the total quantity for both cranes/hoist shall be 100% quantity required for one hoist. 2. 100% of total population of each type, size and rating is defined as 100% requirement for one crane/hoist. 3. Applicable spares from the above list shall be provided as per specific design of the hoist supplier.		

Notes:

- Unless stated otherwise, a "set" or "Lot" means items required for complete replacement in one equipment of each type / size/ range.
- Wherever quantity has been specified as percentage (%), it shall mean percentage (%) of the population of the item required for one unit of 270 MW in the station (project), unless specified otherwise.

	TITLE 4 X 270 MW BHADRADRI TPS TECHNICAL SPECIFICATION FOR SEWAGE TREATMENT PLANT	SPECIFICATION NO. PE-TS-411-673A-A001
		VOLUME: II B
		REV 00
		SHEET 6 of 7

iii) The Mandatory spares for the equipment under the contract provided by the vendor will strictly conform to the specifications and documents and will be identical to the corresponding main equipment/components supplied under the contract.

iv) The quality plan and the inspection requirement finalized for the main equipment will also be applicable to the corresponding mandatory spares.

v) In case, mandatory spares are not applicable as per equipment / item selected, bidder has to provide equivalent mandatory spare as per for selected equipment / item in line with list of mandatory spares.

The vendor warrants:

1. That all spares supplied will be new and in accordance with the contract document and will be free from defects in design, material and workmanship and shall further guarantee as under:

2. In case of any failure in the original component/equipments due to faulty designs, materials and workmanship, the corresponding spare parts if any, supplied will be replaced without any extra cost to the BHEL and customer unless a joint examination and analysis by BHEL and/or customer of such spare parts prove that the defect found in the original part that failed can safely be assured not to be present in spare parts.

3. The long term availability of spares to the BHEL and the customer for the full life of the equipment covered under the contract and that before going out of production of spare parts of the equipment covered under the contract, vendor and his sub-vendors shall give the BHEL and the customer at least 24 (Twenty Four) months advance notice so that the latter may order his bulk requirements of spares, if he so desires. The same provision will also be applicable to the sub-vendors. Further, in case of discontinuance of manufacture of any spares by the vendors or his sub-vendors the vendors and his sub-vendors, will provide the BHEL and the customer, 2 (two) years in advance, with full manufacturing drawings, material specifications and technical information required by the BHEL and the customer for the purpose of manufacture of such items and also the right to manufacture such spares for their own requirements.

4. Further in case of discontinuance of supply of spares by the vendors or his sub-vendors, the vendor will provide the BHEL and the customer with full information for replacement of such spares with other equivalent makes, if so required by the BHEL and the customer.

5. Notwithstanding the above, the vendor shall be responsible for supply of spares for the lifetime of the package at reasonable prices. The prices of all future requirements of spares shall be derived from the corresponding ex-works price at which the orders for such spares have been placed by the BHEL and the customer as a part of the mandatory or long term or any other kind of spares. The base indices for calculating ex-works price shall be commissioning of last equipment under main contract.

vi) The vendor will indicate the delivery period of the spares, which the BHEL and the customer may procure in accordance with this clause.

vii) In case of emergency requirements of spares, the vendor would make every effort to expedite the manufacture and delivery of such spares on the basis of mutually agreed time schedule.

viii) In case the vendor fails to supply the mandatory or long term or any other kind of spares on the terms stipulated above, the BHEL and the customer shall be entitled to purchase the same from the alternate sources at the risk and the cost of the vendor and recover from the vendor, the excess amount paid by the BHEL and the customer over the rates as per the contract. In the event of such risk purchase by the BHEL or the customer, the purchases will be as per the works and procurement

	TITLE 4 X 270 MW BHADRADRI TPS TECHNICAL SPECIFICATION FOR SEWAGE TREATMENT PLANT	SPECIFICATION NO. PE-TS-411-673A-A001
		VOLUME: II B
		REV 00
		SHEET 7 of 7

policy of the BHEL and the customer prevalent at the time of such purchases and BHEL & the customer at his option may include a representative from the vendor in finalizing the purchases.

- ix) It is expressly understood that the final settlement between the parties in terms of relevant clauses of the tender document shall not relieve the vendor of any of his obligations under the provision of long term availability of spares and such provisions shall continue to be enforced till the expiry of 30 (thirty) years period reckoned from the scheduled date of completion of trial operation of the last equipment unless otherwise discharged expressly in writing by the BHEL or the customer.