

2 X 660 MW SURATGARH STPS UNIT 7 & 8

VOLUME -III

TECHNICAL SPECIFICATION
FOR
SUMP PUMPS

Specification No.: PE-TS-392-172-N001 (REV. 0)



BHARAT HEAVY ELECTRICALS LIMITED
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
NOIDA- 201 301



TITLE :
TECHNICAL SPECIFICATION
SUMP PUMPS

COMPLIANCE CERTIFICATE

SPECIFICATION: PE-TS-392-172-N001

NUMBER

VOLUME III
SECTION: A.1
REV-00

Date: 07.07.14

Sheet 1 of 1

The bidder shall confirm compliance with following by signing/ stamping this compliance certificate and furnish same with the offer.

- a) The scope of supply, technical details, construction features, design parameters etc. shall be as per technical specification & there are no exclusions/ deviations with regard to same.
- b) QP/ test procedures shall be submitted in the event of order based on the guidelines given in the specification & QP enclosed therein.
- c) QP will be subject to BHEL/Customer approval in the event of order & customer hold points for inspection/ testing shall be marked in the QP at the contract stage. Inspection/ testing shall be witnessed as per same apart from review of various test certificates/ Inspection records etc.
- d) All drawings/data – sheets etc. to be submitted during contract shall be subject to BHEL/ Customer approval.
- e) There are no other deviations with respect to specification other than those furnished in the 'Schedule of Deviations'.
- f) The offered materials should be either equivalent or superior to those specified. Also for components where material is not specified it shall be suitable for intended duty. All materials shall be subject to approval in the event of order.
- g) Prices for recommended spares (if any) for 3 years operation shall be furnished separately & not included in the base price.
- h) The commissioning spares (if any) are supplied on 'As Required Basis' & prices for same included in the base price (If bidders reply to this is "No commissioning spares are required" and if some spares are actually required during commissioning same shall be supplied by bidder without any cost to BHEL).
- i) All sub vendors shall be as per BHEL/ Customer approved list.
- j) Any special tools & tackles, if required, shall be in bidder's scope.
- k) All models offered have been supplied by bidder in the past and are meeting the experience qualifying criteria of BHEL/ Customer (viz. offered model is successfully operating in two separate stations for at least two years prior to submission of offer/bid. Any deviation to this criteria shall be suitably highlighted in deviation schedule).
- l) All selected motor ratings have minimum margins as per Clause 6.02.00, Section D of Vol IIB
- m) Power & Control circuits shall be with MCCB.


NAME

DESIGNATION

SIGNATURE

DATE

COMPANY SEAL

	TITLE :	SPECIFICATION NO.	PE-TS-392-172-N001	
	TECHNICAL SPECIFICATION	VOLUME :	III	
	FOR	SECTION :		
	SUMP PUMPS	REV. NO.	0	DATE :07.07.14
		SHEET		OF


PART TITLE

A DETAILS TO BE FURNISHED ALONGWITH THE TECHNICALBID:

- A1. COMPLIANCE CERTIFICATE
- A2. TECHNICAL DEVIATION SCHEDULE
- A3. SCHEDULE OF PRICES
- A4. SCHEDULE OF UNIT PRICES
- A5. GA DRAWINGS OF PUMPS AND MOTORS (same shall be only for reference purpose; same shall not be reviewed/commented by purchaser at this stage and shall be subject to approval only during contract.)

B DATA SHEET – B & LIST OF SCHEDULES (TO BE FURNISHED IN THE EVENT OF ORDER)

- B1 DATA SHEET – B
 - B1.1 PUMP DATA SHEET
 - B1.2 ELECTRICAL MOTOR DATA SHEET
 - B1.3 ELECTRICAL LOAD DATA SHEET
- B2 LIST OF SCHEDULES

	TITLE :	SPECIFICATION NO.	PE-TS-392-172-N001	
	TECHNICAL SPECIFICATION	VOLUME :	III	
	FOR	SECTION :		
	SUMP PUMPS	REV. NO.	0	DATE :07.07.14
		SHEET		OF

DOCUMENTS TO BE SUBMITTED ALONG WITH TECHNICAL OFFER

A1. COMPLIANCE CERTIFICATE

A2. TECHNICAL DEVIATION SCHEDULE

A3. SCHEDULE OF PRICES

A4. SCHEDULE OF UNIT PRICES

A5. GA DRAWINGS OF PUMPS AND MOTORS (same shall be only for reference purpose; same shall not be reviewed/commented by purchaser at this stage and shall be subject to approval only during contract.)

FORM No. P/SAI - 0036-0



TITLE

*** SCHEDULE OF DEVIATIONS**

- () From Conditions of Contract (Volume - I)
- () From General Technical Conditions (Volume - II A)
- () From Technical Specifications (Volume - II B)

SPECIFICATION NUMBER PE-ES-250-165-N001

VOLUME III PART - A - 2

SHEET ... OF

... types of deviation shall be noted in a separate sheet Tick the applicable

We the undersigned hereby certify that the above mentioned are the only deviations.

PARTICULARS OF BIDDER / AUTHORIZED REPRESENTATIVE				
NAME	DESIGNATION	SIGNATURE	DATE	COMPANY SEAL



TITLE:

SPECIFICATION NO.

PE-TS-392-172-N001

SCHEDULE OF PRICES

VOLUME

III

SECTION

A 4

DATE

07.07.14

2X660 MW SURATGARH STPS UNIT 7 & 8

REV. NO.

00

SHEET 1 OF 1

SL. No.

DESCRIPTIONS OF WORKS OR EQUIPMENT

- 1.0 Total price for design, manufacture, assembly, inspection, testing, packed for transportation and delivery including special tools/tackles, commissioning and standard & special accessories, etc. as specified and necessary in Technical specification for following pumps :**
- a) Fixed Duty type Submersible pumps for CW Pit in TG Hall 4 Nos.
 - b) Fixed Duty type Submersible pumps for Pit in Rain Water collection tanks 4 Nos.
 - c) Portable Type Submersible Pumps to be used for dewatering CW P/H Sump, Filtered water P/H, Raw water P/H & River Water Intake P/H 8 Nos.
 - d) Portable Type Submersible Pumps to be used for dewatering Desilting chamber 2 Nos.
 - e) Portable Type Submersible Pumps to be used for dewatering of various cable Trenches at various locations. 4 Nos.
 - f) Portable Type Submersible Pumps to be used for dewatering of various sumps of the plant 8 Nos.
 - g) Portable Type Submersible Pumps to be used for dewatering of various sumps of the plant 4 Nos.
 - h) Diesel Engine Driven Pumps to be used for dewatering of various sumps of the plant 2 Nos.

Total Rs.


- 2.0** Recommended spares item-wise breakup with item-wise price to be given as per "Schedule of Recommended Spares" enclosed under Vol. III of Technical Specification. **Rs.**


NOTE: Indicate all duties, taxes etc. stating whether included/ excluded in above price.

Bidder shall furnish this price Schedule in his price offer only

PARTICULARS OF BIDDER/ AUTHORISED REPRESENTATIVE

NAME	SIGNATURE	DATE	COMPANY SEAL
------	-----------	------	--------------

	TITLE:		SPECIFICATION NO.	PE-TS-392-172-N001		
	SCHEDULE OF UNIT PRICES		VOLUME	III		
	2X660 MW SURATGARH STPS UNIT 7 & 8		SECTION	A 5	DATE	07.07.14
			REV. NO.	0	SHEET 1 OF 1	
SL. No.	DESCRIPTIONS OF WORKS OR EQUIPMENT	PRICE (In Rs.)				
1.0	Unit price for Design, manufacture, inspection and testing, packed for transportation and delivery for following as specified in the Technical specification covering complete scope, accessories:					
a)	Fixed Duty type Submersible pumps for CW Pit in TG Hall	Rs.				
b)	Fixed Duty type Submersible pumps for Pit in Rain Water collection tanks	Rs.				
c)	Portable Type Submersible Pumps to be used for dewatering CW P/H Sump, Filtered water P/H, Raw water P/H & River Water Intake P/H	Rs.				
d)	Portable Type Submersible Pumps to be used for dewatering Desilting chamber	Rs.				
e)	Portable Type Submersible Pumps to be used for dewatering of various cable Trenches at various locations.	Rs.				
f)	Portable Type Submersible Pumps to be used for dewatering of various sumps of the plant	Rs.				
g)	Portable Type Submersible Pumps to be used for dewatering of various sumps of the plant	Rs.				
h)	Diesel Engine Driven Pumps to be used for dewatering of various sumps of the plant	Rs.				
2.0	Recommended spares item-wise breakup with item-wise price to be given as per "Schedule of Recommended Spares" enclosed under Vol. III of Technical Specification.	Rs.				
2.0	NOTES: a) Total price of Unit Prices given above should tally with Total price given in Sl. No. (1) of "Schedule of Prices" . In case of discrepancy, the lowest of two shall be considered for order. Bidder to note that prices mentioned in the "Schedule of prices" and "Schedule of Unit Prices" shall be binding for evaluation purposes. b) Unit price quoted by bidder, as above, shall be binding for any quantity variation, which is at the discretion of purchaser.					
Bidder shall furnish this price Schedule in his price offer only						
PARTICULARS OF BIDDER/ AUTHORISED REPRESENTATIVE						
NAME	DESIGNATION	SIGNATURE	DATE	COMPANY SEAL		

	TITLE :	SPECIFICATION NO.	PE-TS-392-172-N001	
	TECHNICAL SPECIFICATION	VOLUME :	III	
	FOR	SECTION :		
	SUMP PUMPS	REV. NO.	0	DATE :07.07.14
		SHEET		OF

DOCUMENTS TO BE SUBMITTED ON PLACEMENT OF LOI

- B1 DATA SHEET – B
 - B1.1 PUMP DATA SHEET
 - B1.2 ELECTRICAL MOTOR DATA SHEET
 - B1.3 ELECTRICAL LOAD DATA SHEET

- B2 LIST OF SCHEDULES

TECHNICAL DATA SHEET FOR SUMP PUMPS

Data Sheet B

SL. NO.	DESCRIPTION	Pump Data
1.1	LOCATION	
1.2	MODEL NO.	
1.3	RATED CAP. (M3/HR)	
1.4	TOTAL HEAD AT RATED CAP. (MLC)	
1.5	TOTAL QUANTITY OF STATION (NOS.)	
1.6	SHUT-OFF HEAD (MLC)	
1.7	PUMP SPEED – RPM	
1.8	PUMP EFF. AT RATED CAPACITY IN %	
1.9	MOTOR EFFECIENCY (AT DUTY POINT) IN %	
1.10	OVER ALL EFFICIENCY IN %	
1.11	INPUT POWER AT RATED CAPACITY (BKW) sp. Gr.1.0	
1.12	INPUT POWER AT RATED CAPACITY (BKW) sp. Gr.1.1	
1.11	MAXIMUM POWER REQUIREMENT IN RANGE OF OPERN. (30% TO 150% OF RATED CAPACITY)(BKW)	
1.13	MOTOR RATING SELECTED, KW	
1.14	MAXIMUM NOISE LEVEL	
1.15	THE PUMPS OFFERED HAVE CONTINEOUSLY RISING HEAD CAP. CURVES FROM THE SPECIFIC DUTY POINT TOWARDS SHUT OFF Pt.	
1.16	THE PUMPS OFFERED HAVE STABLE RISING H-Q CURVES WITH IN THE RANGE OF OPERATION	
2.00	MATERIAL OF CONSTRUCTION	
a	BASE PLATE / COVER PLATE	
b	COLUMN PIPE	
c	CASING	
d	IMPELLER NON CLOG TYPE	
e	MOTOR / IMPELLER SHAFT	
f	SHAFT SLEEVE	
g	SHAFT COUPLING	
h	SHAFT BEARING	
i	GLAND	
j	GLAND PACKING	
k	FASTNERS	
l	DISCHARGE PIPE	
m	MOTOR STOOL	
n	MECHANICAL SEAL	
	UPPER MECHANICAL SEAL (MOTOR)	
	LOWER MECHANICAL SEAL (PUMP)	
o	HOSE PIPE	
p	SUCTION STRAINER	
q	FLANGE & COUNTER FLANGE 80NB FOR BHEL	

TECHNICAL DATA SHEET FOR SUMP PUMPS

Data Sheet B

	INTERFACE	
3.1	MINIMUM REQUIRED SUBMERGENCE FROM SUMP BOTTOM FOR SMOOTH OPERATION	
3.2	TIME PERIOD FOR WHICH PUMP CAN RUN DRY WITHOUT ANY DAMAGE	
3.3	TYPE OF IMPELLER	
3.4	DIA. OF IMPELLER IN mm	
3.5	SIZE OF SUCTION IN mm	
3.6	SIZE OF DISCHARGE IN mm	
4.0	BEARING	
4.1	TYPE	
4.2	LUBRICATION	
4.3	NOS. PER PUMP	
5.0	COUPLING	
5.1	TYPE	
5.2	MANUFACTURER	
6.0	MAXIMUM PARTICAL SIZE THAT CAN BE HANDLED	
7.0	CODE/STD. FOR DESIGN OF PUMP	
8.0	OVERALL DIMENSIONS	
8.1	PUMP WEIGHT	
8.2	MOTOR WEIGHT	
8.3	TOTAL WEIGHT	
9.0	HOSE & HOSE NIPPLE	
9.1	SIZE OF HOSE	
9.2	MAKE &TYPE	
9.3	LENGTH	
9.4	WHETHER HOSE PROVIDED WITH SUITABLE COUPLING/FLANGES AT BOTH ENDS	
10.0	INSPECTION AND TESTING	
10.1	MATERIAL TEST	
10.2	HYDROTEST PRESSURE & DURATION	
10.3	PERFORMANCE TEST ON PUMP	
10.4	STATIC/DYNAMIC BALANCE TEST	
11	SUPPLY OF ACC. & SERVICE	
11.1	BASE / SOLE PLATE	
11.2	FOUNDATION BOLTS, NUTS, SLEVES ETC.	
11.3	COUNTER FLENGES WITH NUT, BOLTS, GASKETS	
11.4	UNION FOR EXTERNAL WATER FOR COOLING	

TECHNICAL DATA SHEET FOR SUMP PUMPS

Data Sheet B

	/SEALING /LUBRICATION	
11.5	COOLING/SEALING/LUBRICATION SYSTEM WITH ALL ACCESSORIES COMPLETE WITH PIPES, VALVES, INSTRUMENTS	
11.6	SUCTION PRESSURE GUAGE	
11.7	PUMP-MOTOR COUPLING & GUARD	
11.8	EYE BOLTS	
12.0	NON RETURN VALVE	
12.2	NOS. PROVIDED	
12.3	SIZE	
12.4	MATERIAL	
13.0	GATE VALVE	
13.1	NOS PROVIDED	
13.2	SIZE	
13.3	MATERIAL	

TECHNICAL DATA SHEET FOR ACCESSORIES

Data Sheet B

SL. NO.	DESCRIPTION	Pump Data
	Accessories – Hose Pipe with Hosp Nipple	
1	Type	
2	Size/ Length	
3	Make	
4	Pressure rating	
5	Mounting	
6	Connection	
	Companion Flange	
1	Size	
2	Pressure Rating	
3	Connection	
	Bend	
1	Class	
2	Size	
	Accessories-Level Probe/switch	
1	Make	
2	Qty per Pump	
3	Electrode Material	
4	Electrode Cap Material	
5	Cable Size	
6	Cable Length	
7	Cable type	
8	Mounting	
	Wheel Trolley	
	Power & Control Cable Data Sheet(for submersible cable from pump to control panel)	
1	Make	
2	Country of Manufacturing	
3	Type & Designation	
4	Applicable Standard	
5	Cable Size	
6	Length per Pump	
7	Rated Voltage	
8	Continuous current rating for	

Data Sheet B

	maximum conductor temp.	
9	Conductor	
A	Conductor Material	
B	Nominal X Section in sq.mm.	
C	Shape of Conductor	
D	D.C. resistance at 20°C Ohms/km	
10	Insulation	
A	Material	
B	Thick	

SPEC.NO. TCE.5750A-H-500-001		TATA CONSULTING ENGINEERS LIMITED		VOLUME IV SECTION:D13	
PART B		RRVUNL, 2 x 660 MW, Super-Critical TPS, Stage- V, Units 7 & 8, at Suratgarh, Rajasthan		SHEET 1 OF 6	
ENQUIRY/SPECIFICATION NO.:			BIDDER:		
SL. NO.	DESCRIPTION	UNITS	BIDDERS DATA		
1.0	Application				
2.0	Manufacturer				
3.0	Country of Origin				
4.0	Applicable Standards				
5.0	Efficiency Category(For Energy Efficient Motors only)				
6.0	Rated a) Output b) Speed c) Frame size	kW RPM			
7.0	Type of Duty (IS 325 or equivalent)				
8.0	Supply Conditions				
	(a) Allowable variation in				
	(i) Voltage AC/DC				
	(ii) Frequency				
	(iii) Combined				
	(b) Permissible unbalance in supply voltage				
<u>NOTES TO BIDDER</u>			SIGNATURE OF BIDDER & DATE		
1. ITEMS WHICH DEVIATE FROM THE SPECIFICATION SHOULD BE MARKED WITHIN ASTERISK (*) AND DETAILS TO BE GIVEN IN SCHEDULE OF DEVIATIONS.			<table border="1" style="float: right;"> <tr> <td style="text-align: center;">ISSUE R1</td> </tr> </table>		ISSUE R1
ISSUE R1					
2. THIS DATA SHEET SHALL BE FILLED UP COMPLETELY AND A COPY SHALL BE ENCLOSED WITH EACH COPY OF THE BID.					

SPEC.NO. TCE.5750A-H-500-001		TATA CONSULTING ENGINEERS LIMITED		VOLUME IV SECTION:D13
PART B		RRVUNL, 2 x 660 MW, Super-Critical TPS, Stage- V, Units 7 & 8, at Suratgarh, Rajasthan		SHEET 2 OF 6
			DATA SHEET-B MOTORS & ACTUATORS	
ENQUIRY/SPECIFICATION NO.:			BIDDER:	
9.0	Guaranteed Efficiency of motor a) At full load b) At duty point At no load			
10.	Guaranteed Power factor of motor a) At full load b) At duty point At no load			
11.0	Current at a) Starting b) Full load c) Duty point Full load & 70 % of rated supply voltage.			
12.0	Rated voltage a)HT motors b)LT motors c)UPS supplied d)Single phase e)DC motors			
13.0	Number of phase			
14.0	Rated frequency for AC motor	Hz		
15.0	Normal winding connection	Star / Delta		
<u>NOTES TO BIDDER</u> 1. ITEMS WHICH DEVIATE FROM THE SPECIFICATION SHOULD BE MARKED WITHIN ASTERISK (*) AND DETAILS TO BE GIVEN IN SCHEDULE OF DEVIATIONS. 2. THIS DATA SHEET SHALL BE FILLED UP COMPLETELY AND A COPY SHALL BE ENCLOSED WITH EACH COPY OF THE BID.			SIGNATURE OF BIDDER & DATE	
			ISSUE R1	

SPEC.NO. TCE.5750A-H-500-001		TATA CONSULTING ENGINEERS LIMITED		VOLUME IV SECTION:D13	
PART B		RRVUNL, 2 x 660 MW, Super-Critical TPS, Stage- V, Units 7 & 8, at Suratgarh, Rajasthan		SHEET 3 OF 6	
			DATA SHEET-B MOTORS & ACTUATORS		
ENQUIRY/SPECIFICATION NO.:			BIDDER:		
16.0	Method of starting a) AC motors b) DC motors				
17.0	Temperature rise above ambient of 50 deg. by Resistance method				
18.0	Type of duty				
19.0	Duty designation				
20.0	Synchronous speed a) Constant speed b) Variable speed (for VFD)				
21.0	Starting time at specified minimum starting voltage	Sec			
22.0	Starting torque (as % of FLT)				
23.0	Pull out torque (as % of FLT)				
24.0	Location considered – Hazardous area division				
25.0	Atmosphere considered- Chemical/Dusty/Salt laden				
26.0	Weather motor is suitable for VFD drive				
27.0	Details of bearing				
28.0	VOID				
<u>NOTES TO BIDDER</u>			SIGNATURE OF BIDDER & DATE		
1. ITEMS WHICH DEVIATE FROM THE SPECIFICATION SHOULD BE MARKED WITHIN ASTERISK (*) AND DETAILS TO BE GIVEN IN SCHEDULE OF DEVIATIONS. 2. THIS DATA SHEET SHALL BE FILLED UP COMPLETELY AND A COPY SHALL BE ENCLOSED WITH EACH COPY OF THE BID.			<table border="1" style="margin-left: auto;"> <tr> <td style="padding: 5px;">ISSUE R1</td> </tr> </table>		ISSUE R1
ISSUE R1					

SPEC.NO. TCE.5750A-H-500-001		TATA CONSULTING ENGINEERS LIMITED		VOLUME IV SECTION:D13	
PART B		RRVUNL, 2 x 660 MW, Super-Critical TPS, Stage- V, Units 7 & 8, at Suratgarh, Rajasthan		SHEET 4 OF 6	
			DATA SHEET-B MOTORS & ACTUATORS		
ENQUIRY/SPECIFICATION NO.:			BIDDER:		
29.0	Whether CT for differential protection required				
30.0	Whether vibration detectors required				
31.0	Details of winding / space heaters				
32.0	Details of accessories a) Fans b) Temperature gauge c) Bearing d) Cooling motors e) Cooling water parameters f) Heaters g) Lube oil system details				
33.0	Maximum size & number of cables that can be accommodated in motor terminal box.				
34.0	Thermal capability curve to be attached				
35.0	Relay co-ordination guide to be attached				
36.0	Min. voltage required under starting conditions to accelerate driven equipment to rated speed.	Volts			
37.0	Locked rotor current withstand time (safe stall time) at 110 % rated voltage a) At rated temp. (hot) b) When cold	sec sec			
38.0	Stator thermal time constant	Sec			
<u>NOTES TO BIDDER</u>			SIGNATURE OF BIDDER & DATE		
1. ITEMS WHICH DEVIATE FROM THE SPECIFICATION SHOULD BE MARKED WITHIN ASTERISK (*) AND DETAILS TO BE GIVEN IN SCHEDULE OF DEVIATIONS.			<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="padding: 5px;">ISSUE R1</td> </tr> </table>		ISSUE R1
ISSUE R1					
2. THIS DATA SHEET SHALL BE FILLED UP COMPLETELY AND A COPY SHALL BE ENCLOSED WITH EACH COPY OF THE BID.					

CHECKLIST — LIST OF SCHEDULES

Sl. No.	Form No.	Description	Tick Applicable Forms
1.	PEM-6024	Schedule of Drawings / Catalogues submitted with Bid	✓
2.	PEM-6025@	Schedule of Occurance of Key Events of Delivery, Erection & Commissioning	
3.	PEM-6026	Schedule of Equipment Manufacture, Despatch and Shipment to Site.	✓
4.	PEM-6027	Schedule of Weights & Dimensions	
5.	PEM-6028@	Schedule of Performance Guarantee	
6.	PEM-6030	Inspection Schedule	✓
7.	PEM-6031	Schedule of Cement and Steel and Quarterly Cement Requirement	
8.	PEM-6032	Schedule of Quarterly Requirement of Reinforcing Bars and Structural Steel	
9.	PEM-6033@	Bill of Quantities (Civil Works)	
10.	PEM-6035	Schedule of Bidder's Proposed Construction / Site Fabrication Facilities.	
11.	PEM-6036	Schedule of Deviations	✓
12.	PEM-6040	Schedule of Declaration	✓
13.	PEM-6041	Quality Plan	✓
14.	PEM-6042	Vendor's Drawings / Documents Schedule	✓
15.	PEM-6043@	Schedule of Occurance of Key Events for Civil / Structural Works	
16.	PEM-6046	Inspection Request	✓
17.	PEM-6051	Schedule of Prices	✓
18.	PEM-6052@	Schedule of Unit Prices	✓
19.	PEM-6053	Schedule of Prices for Commissioning & Mandatory Spares	✓
20.	PEM-6054	Schedule of Prices for Recommended Spares	✓
21.	PEM-6055	Schedule Prices for Erection and Maintenance Tools & Tackles	✓
22.	PEM-6056	Schedule of Bidder's Man-power for Supervision of E & C and their Charges.	✓
23.	PEM-6057	Schedule of Daily & Overtime Rates	
24.	PEM-6058	Schedule of Hire-charges for Construction / Site Fabrication Facilities	
For Forms marked with @ certain information to be filled by DEs - before issuing to bidder.			

FORM No. PEM - 6024-0



TITLE

**SCHEDULE OF DRAWINGS /
CATALOGUES SUBMITTED WITH BID**

SPECIFICATION NUMBER

VOLUME III PART - A

SHEET

Section C/D enclosed with the specification indicate the drawings / catalogues to be furnished with the bid. The bidder in addition to furnishing the same, can also include any other drawings / catalogues which he may desire to submit with the bid. This schedule duly lists out such drawings as enclosed by the bidder with the bid.

DRAWING / CATALOGUE NUMBER	DESCRIPTION	NUMBER OF SHEETS

PARTICULARS OF BIDDER / AUTHORISED REPRESENTATIVE

				COMPANY SEAL
NAME	DESIGNATION	SIGNATURE	DATE	



TITLE :
**SCHEDULE OF OCCURRENCE OF KEY EVENTS
OF DELIVERY ERECTION AND
COMMISSIONING**

SPECIFICATION NUMBER:

VOLUME III PART-A

Sheet of

EQUIPMENT/SYSTEM.	DESCRIPTION OF KEY EVENTS	MONTHS FROM (DATE OF LOI)

We the undersigned hereby undertake to meet the schedule of occurrence of the key event as listed above regarding the delivery, Erection & Commissioning of Equipment/System

PARTICULARS OF BIDDER/ AUTHORISED REPRESENTATIVE

FORM No. PESA - 6026-0



TITLE

**SCHEDULE OF EQUIPMENT,
MANUFACTURE, DESPATCH AND
SHIPMENT TO SITE**

SPECIFICATION NUMBER

VOLUME III PART - A

SHEET OF

Equipment / Major Bought-out Items	Time for Manufacture/ Procurement from Date of Issue of Letter of Intent (Weeks)	Time for Test, Dismantling Packing & Ready for Despatch (Weeks)	Time required for Shipment to Site (Weeks)	Total Time from Date of Issue of Letter of Intent to Shipment to Site (Weeks)

We, the undersigned hereby undertake to meet the above time schedule in weeks for manufacture, despatch and shipment of each equipment and procurement of major boughtout items as listed above.

PARTICULARS OF BIDDER / AUTHORISED REPRESENTATIVE

--	--	--	--

FORM No. PEM - 6027-0



TITLE

SCHEDULE OF WEIGHTS & DIMENSIONS

SPECIFICATION NUMBER

VOLUME III PART - A

SHEET OF

The bidder shall state below the weights and dimensions of various packages for shipment covering the complete scope.

Description of Package(s)	Dimensions (in meters)	Weight (in tonnes)

PARTICULARS OF BIDDER / AUTHORISED REPRESENTATIVE

NAME	DESIGNATION	SIGNATURE	DATE	COMPANY SEAL

FORM No. PEM - 6030-0



INSPECTION SCHEDULE

SPECIFICATION NUMBER _____

P.O. NUMBER _____

VOLUME - III PART - A

SHEET _____ OF _____

S. No.	ITEM/COMPONENT	PLACE & ADDRESS OF TEST / INSPECTION	Scheduled Date of Inspection	Duration of Test / Inspection (in days)

This schedule shall be in line with specification and quality plan requirements. The information in this form shall be furnished after receipt of LOI / PO.

PARTICULARS OF VENDOR'S / AUTHORISED REPRESENTATIVE			
NAME	SIGNATURE	DATE	COMPANY SEAL

FORM No. PFM - 604B-U



TITLE

* SCHEDULE OF DECLARATION

SPECIFICATION NUMBER

VOLUME III PART - A

SHEET OF

DECLARATION

I.....certify that all the technical data and information pertaining to this specification are correct and are true representation of the equipment/system covered by our formal proposal number Dated..... and there is no deviation to the specification.

I hereby certify that I am duly authorised representative of the Bidder's company whose name appears above my signature.

Bidders Company Name

.....

Authorised representative's
Signature

.....

Name

.....

Bidder's Intent

The bidder hereby agrees to fully comply with the requirements and intent of this specifications for the price indicated.

PARTICULARS OF BIDDER / AUTHORISED REPRESENTATIVE

--	--	--	--

QUALITY PLAN

COMPONENT / OPERATION	SHEET	OF		SYSTEM		EXTENT OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORM	FORMAT OF RECORD	AGENCY			REMARKS
		CHARACTERISTIC CHECK	CAT.	TYPE / METHOD OF CHECK	EXTENT OF CHECK	P	W				V			
2	3	4	5	6	7	8	9	10	11					
<p style="text-align: center;">BIDDER / VENDOR</p> <p style="text-align: center;">PARTICULARS</p> <p style="text-align: center;">NAME</p> <p style="text-align: center;">SIGNATURE</p> <p style="text-align: center;">DATE</p>														

BIDDERS / VENDORS COMPANY SEAL

INSTRUCTIONS FOR FILLING QUALITY PLAN

(Form No. PEM-6042-0)

The Quality Plan shall include all the Quality Control Measures and Checks adopted by the Vendor to ensure that the material/component/assembly/services supplied by him meet/will meet the requirements as per specifications and good practices. They shall include all stages of operation such as materials, processes, manufacture, assembly, packing and despatch. The following guide lines may be noted:

- Column 1- Serial Number
- Column 2- Component/Operation- The component and/or operation being checked shall be given here.
- Column 3- Characteristics check- The characteristics being checked shall be given here. e.g., chemical composition, mechanical properties, leak tightness, surface defects etc..
- Column 4- Category - 'CR' stands for critical characteristic - affecting safety of equipment and personnel
'MA' stands for major Characteristic - affecting safety of equipment and personnel
'MI' stands for minor characteristic - affecting appearance etc.
- Column 5- Type/Method of check e.g. chemical analysis tensile testing, hydraulic test, visual examination radiography etc.
- Column 6- Extent of check, such as, 100, 10, 1 per heat etc.
- Column 7- Reference Documents - Documents, such as technical specification, drawings, standard specifications (IS, BS ETC.) procedure, etc. according to which check is done.
- Column 8- Acceptance Norms - Standards etc. according to which acceptability or otherwise of the characteristics being checked is decided.
- Column 9- Format of Record - Formats, log sheets, reports, etc. in which the observations are recorded. Standard log sheets, reports, formats etc. of the Vendors shall be numbered and such reference numbers shall be included here.
- Column 10- Agency - The agency which performs the test/instruction shall be written in sub-column 'W'
The agency which verifies test certificates/inspection records and carries out audit check of the components/operation shall be written in sub-column 'V'
The agencies are codified '1' stands for (BHEL)
as 1,2 & 3 '1' * means the operation shall be cleared by BHEL before the start of the next operation.
'2' Stands for Vendor
'3' stands for sub-Vendor of the Vendor and so on.

Example :

Entry '3' in column 'P' means test/inspection to be performed by sub-Vendor's QC

Entry '2' in column 'W' means test/inspection to be witnessed by Vendor's QC

Entry '1' in column 'V' means verification shall be done by BHEL and next stage to be started only after the hold point is cleared by BHEL.

Column II- Remarks - Any special remarks shall be given here.

NOTES :

1. In absence of correlation with the test certificate(s) (e.g. material identification) samples shall be drawn by BHEL and all tests as per relevant specifications shall be carried out in their presence or in recognized Government Laboratory.
2. When materials and components are initially identified and stamped by BHEL QS engineer, the identification marks shall be preserved till despatch. Wherever this is not possible, the identification mark shall be transferred to the components in the presence of BHEL QS Engineer unless otherwise agreed.
3. For castings and forgings integral test specimens shall be provided. When this is not possible for casting, they shall be poured in the presence of BHEL QS Engineer unless otherwise, if witnessing of test by BHEL is called for.
4. When welders qualified by reputed inspection agencies or statutory bodies are not available, qualification tests shall be conducted in the presence of BHEL QS Engineer.
5. This Quality Plan is liable to be modified as per the requirements of approved drawings and changes in technical specifications/drawings. If there are contradictions in respect of column 7 & 8 between this Quality Plan and the approved drawings specifications, the latter shall prevail.
6. Wherever inspection by BHEL's Purchaser/Third Party/Statutory authorities are mandatory, this shall be complied with.
7. Inspection reports, log sheets, test reports/certificate, etc. shall be furnished to BHEL, at the appropriate stage or at the time of final inspection, as required.
8. This Quality Plan is also applicable to spares, if any, under scope of supply of Vendor.



**VENDOR's
DRAWINGS/DOCUMENTS SCHEDULE**
(Information in this form is to be furnished
only after receipt of LOI/IPO)

SPECIFICATION NO

VOLUME **III**

SECTION **PART-A**

REV NO. **0**

SHEET **1 OF 1**

TITLE OF SPECIFICATION

S. NO.	Vendor's Drawing/Document No. (VDN)	PEM's Drawing/Document No. (PDN)	First Submission Date
	TITLE		Final Approval Date
	VDN	PDN	
	TITLE		
	VDN	PDN	
	TITLE		
	VDN	PDN	
	TITLE		
	VDN	PDN	
	TITLE		
	VDN	PDN	
	TITLE		
	VDN	PDN	
	TITLE		
	VDN	PDN	
	TITLE		

PARTICULARS OF VENDOR's/AUTHORISED REPRESENTATIVE

NAME	SIGNATURE	DATE	COMPANY SEAL



**VENDOR'S
DRAWINGS/DOCUMENTS SCHEDULE**
(Information in this form is to be furnished
only after receipt of LOI/IPO)

SPECIFICATION NO

VOLUME III

SECTION PART-A

REV NO. 0

SHEET 1 OF 1

INSPECTION REQUEST
(From Vendor to BHEL Inspection Agency)

1. PROJECT TITLE

2. NAME OF VENDOR

3. BHEL'S LOI/PO NO

DATE

4. SYSTEM/ITEM DESCRIPTION

5. ITEM BEING OFFERED FOR INSPECTION WITH SL. NO. AS PER LOI/PO/BILLING SCHEDULE

6. DESCRIPTION AND SL. NO. OF INSPECTION AS PER QUALITY PLAN

7. QUANTITY OFFERED FOR INSPECTION

8. PLACE OF INSPECTION (FULL ADDRESS AND NAME OF SUB-VENDOR, IF ANY)

PLACE

ADDRESS

9. CONTACT PERSON (FOR SL. NO. 8 ABOVE)-

NAME DESIGNATION

TELEPHONE FAX TELEGRAM TELEX

10. THE FOLLOWING DOCUMENTS ARE APPROVED BY BHEL AND AVAILABLE AT PLACE OF INSPECTION :

- (A). QUALITY PLAN (B) DRAWINGS (C) DATA SHEETS, CHARACTERISTIC CURVES ETC.
- (D). PLANT STANDARDS

11. REQUIRED DATE OF INSPECTION : LIKELY DURATION(No.of working days).....
WEEKLY OFF DAY WORKING HOURS

(At least 15 days prior notice shall be given by the Vendor to Inspection Agency)

We hereby certify that the above items are complete in all respects and have been fully inspected/tested by us and are found to be as per technical specification/approved drawings/data sheets/characteristic curves and are acceptable to our QC department. The detailed inspection and test reports of our QC department are enclosed.

VENDOR'S PARTICULARS

Name	Designation	Signature	Place	Date	Seal

FORM No. PENI - 6051-0



TITLE

*** SCHEDULE OF PRICES FOR COMMISSIONING AND MANDATORY SPARES**

SPECIFICATION NUMBER

VOLUME III

SHEET OF

The bidder shall indicate here the quantity required for erection / commissioning and mandatory spares for equipment as listed in Section-C / Section - D. If the listed spares are not adequate, then the bidder shall indicate those and additional spares considered necessary by him.

Type	Manufacturer's Drawing No. / Part of spare	Description	Material	Quantity per Unit / Equipment	Quantity Required	If sec. Nos Per set	Delivery period (Weeks)	Unit Price (Rs.)	Total Price (Rs.)
Erection and Commissioning									
Mandatory Spares									
Additional Spares Mandatory Erection / Commissioning									

* Unpriced schedule shall also be furnished along with Part-A Schedule in Technical Bid.

PARTICULARS OF BIDDER / AUTHORISED REPRESENTATIVE

--	--	--	--	--	--	--	--	--	--

COMPANY SEAL

FORM No. PEM - 0056-D



TITLE

**SCHEDULE OF BIDDER'S MAN POWER
FOR SUPERVISION OF E & C
AND THEIR CHARGES**

SPECIFICATION NUMBER

VOLUME III

SHEET OF

The bidder shall indicate below, designation-wise, the personnel required for supervision of erection and commissioning and their charges.

SUPERVISION OF ERECTION

S. No.	Designation	Normal rate per day of 8 hours	Overtime rate per hour

SUPERVISION OF COMMISSIONING

Sl. No.	Designation	Normal rate per day of 8 hours	Overtime rate per hour

PARTICULARS OF BIDDER / AUTHORISED REPRESENTATIVE

--	--	--	--