

RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED (RRUVNL)

2 X 660 MW SURATGARH STPS UNIT 7 & 8


VOLUME -III

**TECHNICAL SPECIFICATION
FOR
MISCELLANEOUS PUMPS**

Specification No. : PE-TS-392-100-N002 (REV. 0)



**BHARAT HEAVY ELECTRICALS LIMITED
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
PPEI BUILDING, SECTOR 16 A
NOIDA - 201301**

	PREAMBLE	SPECN. NO.:		PE-TS-392-100-N002	
		REV. NO.	0	DATE:	20.11.13
<p>1.0 The tender document contains three (3) volumes. The bidder shall meet the requirements of all the three volumes.</p> <p>1.1 Volume -I CONDITIONS OF CONTRACT</p> <p>This consists of four parts as below:</p> <p>Volume - I A : This part contains instructions to bidders for making bids to BHEL.</p> <p>Volume - I B : This part contains general commercial conditions of the tender and include provision that vendor shall be responsible for the quality of item supplied by their sub-vendors.</p> <p>Volume - I C : This part contains special conditions of contract.</p> <p>Volume - I D : This part contains commercial conditions for erection and commissioning site work, as applicable.</p> <p>1.2 Volume - TECHNICAL SPECIFICATIONS</p> <p>Technical requirements are stipulated in Volume II which comprises of:</p> <p>Volume - II A : General Technical Conditions</p> <p>Volume - II B : Technical specification including drawings, if any</p> <p>1.2.1 Volume - II B :</p> <p>This volume is sub-divided into following sections:</p> <p>Section - A : This section outlines the scope of enquiry.</p> <p>Section - B : This section provides "Project Information"</p> <p>Section - C : This section indicates technical requirements specific to the contract, not covered in Section-D.</p> <p>Section - D : This section comprises of technical specifications of equipments complete with data sheet A, B & C.</p> <p>Data sheet - A specifies data and other requirements pertaining to the equipment.</p> <p>Data sheet - B specifies data to be filled by the bidder (Data Sheet B is contained in Volume - III)</p> <p>Data sheet - C indicates data documents to be furnished after the award of contract as per agreed schedule by the vendor (as applicable).</p> <p>1.2.2 Volume - III TECHNICAL SCHEDULES</p> <p>This volume contains technical schedules and Data Sheets - B, which are to be duly filled by the bidder and the same shall be furnished with the technical bid as per checklist, sec B7 in vol III</p> <p>2.0 The requirements mentioned in Section C/Data Sheets-A of Section-D shall prevail and govern in case of conflict between the same and the corresponding requirements mentioned in the descriptive portion in Section -D.</p>					



TECHNICAL SPECIFICATIONS

SPECN. NO.:

PE-TS-392-100-N002

VOLUME:

III

SECTION:

MISCELLANEOUS PUMPS

REV. NO.


0

DATE:

20.11.13


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	TECHNICAL SPECIFICATIONS	SPECN. NO.: PE-TS-392-100-N002		
		VOLUME:	III	SECTION: A
	MISCELLANEOUS PUMPS	REV. NO.	0	DATE: 20.11.13

DOCUMENTS TO BE SUBMITTED ALONG WITH THE OFFER

- A1 COMPLIANCE CERTIFICATE
- A2 SCHEDULE OF DEVIATIONS
- A3 SCHEDULE OF PERFORMANCE GUARANTEES
- A4 SCHEDULE OF PRICES
- A5 SCHEDULE OF UNIT PRICES
- A6 INPUTS FOR HT MOTORS
- A7 GENERAL ARRANGEMENT DRAWING

	TECHNICAL SPECIFICATIONS	SPECN. NO.:		PE-TS-392-100-N002	
	MISCELLANEOUS PUMPS COMPLIANCE CERTIFICATE	VOLUME:	III	SECTION:	A1
		REV. NO.	0	DATE:	20.11.13
<p>The bidder shall confirm compliance with following by signing/ stamping this compliance certificate and furnish same with the offer.</p> <p>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.</p> <p>b) QP/ test procedures shall be submitted in the event of order based on the guidelines given in the specification & QP enclosed therein.</p> <p>QP will be subject to BHEL/ CONSULTANT/ 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.</p> <p>c) All drawings/data – sheets etc. to be submitted during contract shall be subject to BHEL/ CONSULTANT/ CUSTOMER approval.</p> <p>d) There are no other deviation with respect to specification other than those furnished in the 'Schedule of Deviations'.</p> <p>e) Mandatory spares as indicated in Datasheet A shall be included in the base price</p> <p>Any mandatory spares stated as not applicable, shall have to be supplied without any cost implication to BHEL in the event they are found to be applicable during detail engineering stage.</p> <p>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.</p> <p>g) Prices for recommended spares (if any) for 3 years operation shall be furnished separately & not included in the base price.</p> <p>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).</p> <p>i) All sub vendors shall be as per BHEL/CONSULTANT/CUSTOMER approved list.</p> <p>j) Tests for noise, vibration, parallel running etc. for pumps shall be conducted at site by BHEL and if the site performance is found not meeting the requirements in any respect as specified, then the equipment shall be rectified or replaced by the vendor, at his own cost.</p> <p>k) Any special tools & tackles, if required, shall be in bidder's scope.</p> <p>l) All models offered have been supplied by bidder in the past and are meeting the experience qualifying criteria of BHEL/CONSULTANT/CUSTOMER (viz. offered model is successfully operating in two separate stations for at least two years as on the date of submission of the offer). Any deviation to this criteria shall be suitably highlighted in deviation schedule.</p> <p>m) All selected motor ratings have minimum margins as per Datasheet A, Section D1 of Vol IIB</p> <p>We the undersigned hereby undertake to meet the compliance requirements as listed above on the conditions as elsewhere specified.</p>					
PARTICULARS OF BIDDER/ AUTHORISED REPRESENTATIVE					
NAME	DESIGNATION	SIGNATURE	DATE	COMPANY SEAL	

FORM No. PLM - 6036-0



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-TS-250-165-N001

VOLUME III SECTION A-2

SHEET OF

Tick the applicable

Enter type of deviation shall be noted in a separate sheet

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

PARTICULARS OF BIDDER / AUTHORISED REPRESENTATIVE

NAME	DESIGNATION	SIGNATURE	DATE	COMPANY/SEAL

**SCHEDULE OF PERFORMANCE GUARANTEES****2 X 660 MW SURATGARH STPS UNIT 7 & 8**

SPECN. NO.: PE-TS-392-100-N002

VOLUME: III SECTION: A3 Sheet 1 of 2

REV. NO. 0 DATE: 20.11.13

Following parameters are guaranteed for following pumps

Sl. No.	Pump Description	Guaranteed Capacity	Guaranteed TDH	Guaranteed Pump Eff.	Guaranteed Motor Eff.	Guaranteed Power consumption at inlet to motor terminals	Pump model	Motor Rating	Pump GD ² Value for HT motor driven pump only	Pump RPM	Pump T/S Curve attached for HT motor selection
		(M3/Hr)	(MWC)	%	%	(KW)		(KW)			
	Horizontal pumps (Group I)										
1	# DMCW TG AUX PUMPS	1050	38		93						YES
2	# DMCW SG AUX PUMPS	800	57		93						YES
3	APH/ ESP WASH PUMPS	750	82		93						YES
4	# CHP MAKE UP PUMPS	325	35								
5	# AHP MAKE UP PUMPS	850	18								
6	# DM MAKE UP PUMPS	85	60								
7	# HOTWELL MAKE UP PUMPS	130	65								
8	BOILER FILL PUMPS	200	175								

Note: 1 # Bid evaluation and LD is applicable for these pumps only as per clause 4.00.00 of std technical specn for pumps, section D1, Volume IIB.

We the undersigned hereby undertake to meet the performance guarantees as listed in the table above on the conditions as elsewhere specified. Any variation of the specified conditions during official tests will be taken in account by the customer

PARTICULARS OF BIDDER/ AUTHORISED REPRESENTATIVE

NAME	DESIGNATION	SIGNATURE	DATE	COMPANY SEAL
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**SCHEDULE OF PERFORMANCE GUARANTEES****2 X 660 MW SURATGARH STPS UNIT 7 & 8**

SPECN. NO.: PE-TS-392-100-N002

VOLUME: III SECTION: A3 Sheet 2 of 2

REV. NO. 0 DATE: 20.11.2013

Following parameters are guaranteed for following pumps


Sl. No.	Pump Description	Guaranteed Capacity	Guaranteed TDH	Guaranteed Pump Eff.	Guaranteed Motor Eff.	Guaranteed Power consumption at inlet to motor terminals	Pump model	Motor Rating	Pump GD ² Value for HT motor driven pump only	Pump RPM	Pump T/S Curve attached for HT motor selection
		(M3/Hr)	(MWC)	%	%	(KW)		(KW)			
	Vertical pumps (Group II)										
1	# ACW PUMPS	1550	40		93						YES
2	# RIVER/ RAW WATER INTAKE PUMPS	2150	50		93						YES
3	# RAW WATER PUMPS	2050	30		93						YES
4	# ASH WATER MAKE UP PUMPS	375	30								
5	PLANT POTABLE/ FILTERED WATER PUMPS	25	53								
6	# AHP SEAL WATER PUMPS	150	30								
7	# CW MAKE UP PUMPS	1725	16								
8	PLANT SERVICE WATER PUMPS	300	91								


Note: 1 # Bid evaluation and LD is applicable for these pumps only as per clause 4.00.00 of std technical specn for pumps, section D1, Volume IIB.


We the undersigned hereby undertake to meet the performance guarantees as listed in the table above on the conditions as elsewhere specified. Any variation of the specified conditions during official tests will be taken in account by the customer


PARTICULARS OF BIDDER/ AUTHORISED REPRESENTATIVE

NAME	DESIGNATION	SIGNATURE	DATE	COMPANY SEAL
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	TITLE:		SPECIFICATION NO.		PE-TS-392-100-N002																		
	SCHEDULE OF PRICES		VOLUME		III																		
			SECTION		A 4																		
	2 X 660 MW SURATGARH STPS UNIT 7 & 8		REV. NO.		00																		
				DATE		20.11.13																	
				SHEET		1 OF 2																	
SL. No.	DESCRIPTIONS OF WORKS OR EQUIPMENT																						
1.0	<p>Total price for design, manufacture, assembly, inspection, testing, properly packed for transportation and delivery of Misc. pumps including motors, special tools/tackles, commissioning spares, installation checks and replacement of gland packing with mechanical seal arrangement (if applicable) at site, all accessories, auxiliaries etc and mandatory spares as specified in Technical specification for :</p> <p style="text-align: center;">Horizontal Pumps (Group I)</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">i) DMCW TG AUX PUMPS</td> <td style="width: 10%;">SIX (6) Nos.</td> <td rowspan="8" style="width: 10%; text-align: center; vertical-align: middle;"> <div style="font-size: 3em;">}</div> Total Rs. </td> </tr> <tr> <td>ii) DMCW SG AUX PUMPS</td> <td>FOUR (4) Nos.</td> </tr> <tr> <td>iii) APH/ ESP WASH PUMPS</td> <td>TWO (2) Nos.</td> </tr> <tr> <td>iv) CHP MAKE UP PUMPS</td> <td>TWO (2) Nos.</td> </tr> <tr> <td>v) AHP MAKE UP PUMPS</td> <td>THREE (3) Nos.</td> </tr> <tr> <td>vi) DM MAKE UP PUMPS</td> <td>TWO (2) Nos.</td> </tr> <tr> <td>vii) HOTWELL MAKE UP PUMPS</td> <td>FOUR (4) Nos.</td> </tr> <tr> <td>viii) BOILER FILL PUMPS</td> <td>TWO (2) Nos.</td> </tr> </table>						i) DMCW TG AUX PUMPS	SIX (6) Nos.	<div style="font-size: 3em;">}</div> Total Rs.	ii) DMCW SG AUX PUMPS	FOUR (4) Nos.	iii) APH/ ESP WASH PUMPS	TWO (2) Nos.	iv) CHP MAKE UP PUMPS	TWO (2) Nos.	v) AHP MAKE UP PUMPS	THREE (3) Nos.	vi) DM MAKE UP PUMPS	TWO (2) Nos.	vii) HOTWELL MAKE UP PUMPS	FOUR (4) Nos.	viii) BOILER FILL PUMPS	TWO (2) Nos.
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vi) DM MAKE UP PUMPS	TWO (2) Nos.																						
vii) HOTWELL MAKE UP PUMPS	FOUR (4) Nos.																						
viii) BOILER FILL PUMPS	TWO (2) Nos.																						
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.																	
3.0	Price for site visit (per manday basis) (Optional and additional , apart from that included in 1.0 above))					Rs.																	
NOTE:																							
1.	Indicate all duties, taxes etc. stating whether included/ excluded in above price.																						
2.	Bidder to include cost of three site visits for three days each for installation check & replacement of gland packing with Mechanical seal (if applicable), in their base price in 1.0 above. Further optional & additional prices for site visit are to be quoted as per 3.0 above.																						
Bidder shall furnish this price Schedule in his price offer only																							
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	TITLE:		SPECIFICATION NO.		PE-TS-392-100-N002																		
	SCHEDULE OF PRICES		VOLUME		III																		
			SECTION		A 4																		
	2 X 660 MW SURATGARH STPS UNIT 7 & 8		REV. NO.		00																		
				DATE		20.11.2013																	
				SHEET		2 OF 2																	
SL. No.	DESCRIPTIONS OF WORKS OR EQUIPMENT																						
1.0	<p>Total price for design, manufacture, assembly, inspection, testing, properly packed for transportation and delivery of Misc. pumps including motors, special tools/tackles, commissioning spares, installation checks at site, all accessories, auxiliaries etc and mandatory spares as specified in Technical specification for :</p> <p style="text-align: center;">Vertical Pumps (Group II)</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">i.) ACW PUMPS</td> <td style="width: 10%;">FIVE (5) Nos.</td> <td rowspan="8" style="width: 10%; text-align: center; vertical-align: middle;"> <div style="font-size: 3em;">}</div> Total Rs. </td> </tr> <tr> <td>ii) RIVER/ RAW WATER INTAKE PUMPS</td> <td>FIVE (5) Nos.</td> </tr> <tr> <td>iii) RAW WTER PUMPS</td> <td>THREE (3) Nos.</td> </tr> <tr> <td>iv) ASH WATER MAKE UP PUMPS</td> <td>THREE (3) Nos.</td> </tr> <tr> <td>v) PLANT POTABLE/ FILTERED WATER PUMPS</td> <td>TWO (2) Nos.</td> </tr> <tr> <td>vi) AHP SEAL WATER PUMPS</td> <td>TWO (2) Nos.</td> </tr> <tr> <td>vii) CW MAKE UP PUMPS</td> <td>THREE (3) Nos.</td> </tr> <tr> <td>viii) PLANT SERVICE WATER PUMPS</td> <td>TWO (2) Nos.</td> </tr> </table>						i.) ACW PUMPS	FIVE (5) Nos.	<div style="font-size: 3em;">}</div> Total Rs.	ii) RIVER/ RAW WATER INTAKE PUMPS	FIVE (5) Nos.	iii) RAW WTER PUMPS	THREE (3) Nos.	iv) ASH WATER MAKE UP PUMPS	THREE (3) Nos.	v) PLANT POTABLE/ FILTERED WATER PUMPS	TWO (2) Nos.	vi) AHP SEAL WATER PUMPS	TWO (2) Nos.	vii) CW MAKE UP PUMPS	THREE (3) Nos.	viii) PLANT SERVICE WATER PUMPS	TWO (2) Nos.
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3.0	Price for site visit (per manday basis) (Optional and additional , apart from that included in 1.0 above))					Rs.																	
NOTE:	<p>1. Indicate all duties, taxes etc. stating whether included/ excluded in above price.</p> <p>2. Bidder to include cost of three site visits for three days each for installation check & replacement of gland packing with Mechanical seal (if applicable), in their base price in 1.0 above. Further optional & additional prices for site visit are to be quoted as per 3.0 above.</p>																						
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-392-100-N002	
SCHEDULE OF UNIT PRICES				VOLUME III	
				SECTION A 5	
				DATE 20.11.13	
2X660 MW SURATGARH STPS UNIT 7 & 8				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, properly packed for transportation and delivery for following Pumps as specified in the Technical specification covering complete scope including installation checks and replacement of gland packing with mechanical seal arrangement (if applicable) at site, accessories etc.			
1.1		Pumps and Motor Unit price (Horizontal Pumps Group I):			
(i)		DMCW TG AUX PUMPS Pump price: Motor price: Pump/ Motor accessories (As applicable) Mandatory Spares		Rs. Rs. HT MOTOR IN BHEL'S SCOPE Rs. Rs.	
(ii)		DMCW SG AUX PUMPS Pump price: Motor price: Pump/ Motor accessories (As applicable) Mandatory Spares		Rs. Rs. HT MOTOR IN BHEL'S SCOPE Rs. Rs.	
(iii)		APH/ ESP WASH PUMPS Pump price: Motor price: Pump/ Motor accessories (As applicable) Mandatory Spares		Rs. Rs. HT MOTOR IN BHEL'S SCOPE Rs. Rs.	
(iv)		CHP MAKE UP PUMPS Pump price: Motor price: Pump/ Motor accessories (As applicable) Mandatory Spares		Rs. Rs. Rs. Rs.	
(v)		AHP MAKE UP PUMPS Pump price: Motor price: Pump/ Motor accessories (As applicable) Mandatory Spares		Rs. Rs. Rs. Rs.	
(vi)		DM MAKE UP PUMPS Pump price: Motor price: Pump/ Motor accessories (As applicable) Mandatory Spares		Rs. Rs. Rs. Rs.	
(vii)		HOTWELL MAKE UP PUMPS Pump price: Motor price: Pump/ Motor accessories (As applicable) Mandatory Spares		Rs. Rs. Rs. Rs.	
(viii)		BOILER FILL PUMPS Pump price: Motor price: Pump/ Motor accessories (As applicable) Mandatory Spares		Rs. Rs. Rs. Rs.	
(ix)		Cost of Site visits for Installation checks and replacement of Gland packing with Mechanical seal (As applicable)		Rs.	
2.0		Recommended spares list with item-wise break-up to be given separately as per respective price schedule in Volume-III.		Rs.	
3.0		Others, if any (please specify)		Rs.	
4.0		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 ordering. 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.			
		c) Price of commissioning & erection spares and other accessories not listed above shall be included in the price of pump & shall be supplied with the pump.			
		d) Indicate all taxes, duties etc. stating whether included/ excluded in above prices.			
Bidder shall furnish this price Schedule in his price offer only					
NAME		DESIGNATION		SIGNATURE	
DATE		COMPANY SEAL			

		TITLE:		SPECIFICATION NO. PE-TS-392-100-N002	
SCHEDULE OF UNIT PRICES				VOLUME III	
				SECTION A 5	
2X660 MW SURATGARH STPS UNIT 7 & 8				REV. NO. 0	
				DATE 20.11.2013	
				SHEET 2 of 2	
SL. No.		DESCRIPTIONS OF WORKS OR EQUIPMENT		PRICE (In Rs.)	
1.0		Unit price for Design, manufacture, inspection and testing, seaworthy packed for transportation and delivery for following Pumps as specified in the Technical specification covering complete scope including installation checks at site, accessories etc.			
1.1		Pumps and Motor Unit price (Vertical Pumps Group II):			
(i) ACW PUMPS		Pump price: Rs. Motor price: Rs. Pump/ Motor accessories (As applicable) Rs. Mandatory Spares Rs.		HT MOTOR IN BHEL'S SCOPE	
(ii) RIVER/ RAW WATER INTAKE PUMPS		Pump price: Rs. Motor price: Rs. Pump/ Motor accessories (As applicable) Rs. Mandatory Spares Rs.		HT MOTOR IN BHEL'S SCOPE	
(iii) RAW WTER PUMPS		Pump price: Rs. Motor price: Rs. Pump/ Motor accessories (As applicable) Rs. Mandatory Spares Rs.		HT MOTOR IN BHEL'S SCOPE	
(iv) ASH WATER MAKE UP PUMPS		Pump price: Rs. Motor price: Rs. Pump/ Motor accessories (As applicable) Rs. Mandatory Spares Rs.			
(v) PLANT POTABLE/ FILTERED WATER PUMPS		Pump price: Rs. Motor price: Rs. Pump/ Motor accessories (As applicable) Rs. Mandatory Spares Rs.			
(vi) AHP SEAL WATER PUMPS		Pump price: Rs. Motor price: Rs. Pump/ Motor accessories (As applicable) Rs. Mandatory Spares Rs.			
(vii) CW MAKE UP PUMPS		Pump price: Rs. Motor price: Rs. Pump/ Motor accessories (As applicable) Rs. Mandatory Spares Rs.			
(viii) PLANT SERVICE WATER PUMPS		Pump price: Rs. Motor price: Rs. Pump/ Motor accessories (As applicable) Rs. Mandatory Spares Rs.			
ix) Cost of Site visits for Installation checks and replacement of Gland packing with Mechanical seal (As applicable)		Rs.			
2.0		Recommended spares list with item-wise break-up to be given separately as per respective price schedule in Volume-III.		Rs.	
3.0		Others, if any (please specify)		Rs.	
4.0		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.			
		c) Price of commissioning & erection spares and other accessories not listed above shall be included in the price of pump & shall be supplied with the pump.			
		d) Indicate all taxes, duties etc. stating whether included/ excluded in above prices.			
Bidder shall furnish this price Schedule in his price offer only					
NAME		DESIGNATION		SIGNATURE	
				DATE	
				COMPANY SEAL	



TECHNICAL SPECIFICATIONS

SPECN. NO.:

PE-TS-392-100-N002

MISCELLANEOUS PUMPS

VOLUME:

III

SECTION:

B

REV. NO.


0


DATE:


20.11.13

DOCUMENTS TO BE SUBMITTED ON PLACEMENT OF LOI

- B.1 PUMP DATA SHEET -B ALONG WITH PERFORMANCE CURVE
- B.2 GA & CROSS SECTIONAL DRAWING
- B.3 PUMP QAP (REFER STANDARD PUMP QP ATTACHED AT SECTION D OF VOL II B)
- B.4 MOTOR DATASHEET -C ALONG WITH OTHER MOTOR DOCUMENTS
- B.5 MOTOR QAP (REFER STANDARD MOTOR QP ATTACHED AT SECTION D OF VOL II B)
- B.6 ELECTRICAL LOAD DATA
- B.7 SCHEDULE AS PER LIST

		PROJECT: MISCELLANEOUS PUMPS DATASHEET - B		VENDOR DOC. NO.		REV NO.	
				BHEL DOC. NO.		REV NO.	
SL.	DESCRIPTION	UOM	PUMP DATA	PUMP DATA	PUMP DATA	PUMP DATA	PUMP DATA
1.0	GENERAL						
1.1	Designation of the Pump						
1.2	Manufacturer						
1.3	Model No.						
1.4	No. of pumps	Nos.					
1.5	System Design Pressure	Kg/cm ²					
1.6	Specific Gravity of fluid to be handled	-					
2.0	PERFORMANCE PARAMETERS						
2.1	Performance standard						
2.2	Rated capacity. (No negative tolerance)	M ³ /hr					
2.3	Total Dynamic Head (TDH) at rated capacity (No negative tolerance)	MWC					
2.4	Shut off head	MWC					
2.5	Range of Operation of the Pump						
	a) Min.Flow	M ³ /hr					
	b) Max.Flow	M ³ /hr					
2.6	The pumps offered have continuously rising head capacity curves from the duty point towards shut off point.						
2.7	The pumps offered have stable rising H-Q curves within the "Range of Operation"						
2.8	Pump rated speed	RPM					
2.9	Vibration measurements						
2.9.1	Max.value of vibration on any pump /motor bearing w.r.t. velocity (Vrms) as per ANSI/ HIS 9.6.4 for speed > 600 RPM						
	a) Guaranteed at manufacturer's works	mm/s					
	b) Guaranteed at site	mm/s					
2.9.2	Max.value of vibration on any pump /motor bearing w.r.t. peak to peak amplitude as per ANSI/ HIS 9.6.4 for speed <= 600 RPM						
	a) Guaranteed at manufacturer's works	microns					
	b) Guaranteed at site	microns					
2.10	Max. noise Level (Guaranteed at site)	dB					
2.11	Guaranteed Pump efficiency at rated head & rated capacity without -ve tolerance	%					
2.12	Power consumption						
	a) Guaranteed pump input power at duty point	KW					
	b) Guaranteed max. Pump input power within range of operation.	KW					
	c) Max. pump input power at shut off	KW					
	d) Guranteed power at motor input	KW					
2.13	NPSH required at rated capacity	MWC					
3.0	DESIGN & CONSTRUCTION FEATURES						
3.1	Type of pump casing						
3.2	Pump duty						
3.3	Type of Impeller						
3.4	Location						
3.5	Pump suitable for parallel operation						
3.6	Torque speed curve of the pump & drive motor furnished for pumps with drive motor rating of 100 KW and above.						
3.7	Pump number of stages						

		PROJECT: MISCELLANEOUS PUMPS DATASHEET - B		VENDOR DOC. NO.		REV NO.	
				BHEL DOC. NO.		REV NO.	
SL.	DESCRIPTION	UOM	PUMP DATA	PUMP DATA	PUMP DATA		
3.8	Specific speed $N = \frac{\text{RPM} \times (\text{Flow in USGPM})^{1/2}}{(\text{Head in Ft.})^{3/4}}$						
3.9	Minimum suction head required in MLC for pump operation at maximum discharge point within the 'Range of Operation' specified (NPSHR at max. flow).						
3.10	Whether pump is suitable/designed so that pump internals can be attended without disturbing suction and discharge piping.						
3.11	Type of coupling between pump & motor						
3.12	Bearing (DE & NDE)						
	a) Type and manufacturer						
	b) Bearing no.						
	c) Type of lubrication						
	d) Design life (Hrs.)						
3.13	Shaft Sealing arrangement						
	a) Type and manufacturer						
	b) Sealing liquid						
	c) Requirement of external water if any						
	i) Quality						
	ii) Quantity/ Pump	M ³ /hr					
3.14	In case separate oil/grease/water pump or any such equipment required for bearing lubrication/stuffing box gland sealing, furnish full technical details of these equipment and their drive.						
4.0	MATERIAL OF CONSTRUCTION (Indicate applicable code/ standard)						
4.1	Casing						
4.2	Impeller						
4.3	Shaft						
4.4	Shaft sleeves						
4.5	Wear ring						
4.6	fasteners						
4.7	Gland						
4.8	Lantern ring						
4.9	Mechanical seals (faces)/						
	Gland packing						
4.10	Base plate						
5.0	CONNECTIONS AND OTHER DIMENSIONAL DETAILS						
5.1	Impeller diameter	mm					
6.0	DRIVE DATA						
6.1	Drive unit output at 50°C ambient condition	KW/ P					
7.0	INSPECTION & TESTING						
7.1	Material test						
7.2	Hydrostatic test pressure	Kg/cm ²					
7.3	Hydrostatic test duration	Min.					
7.4	Performance test on pump at shop						
7.5	Dyanamic balance test						
8.0	WEIGHT AND LOADING DATA						
8.1	Weight of the pump & drive assembly	Kg					
8.2	Weight of the heaviest piece to be handled	Kg					

	PROJECT: MISCELLANEOUS PUMPS DATASHEET - B		VENDOR DOC. NO.		REV NO.	
			BHEL DOC. NO.		REV NO.	
SL.	DESCRIPTION	UOM	PUMP DATA	PUMP DATA	PUMP DATA	
8.3	Size of base plate (length x width)	mm				
9.0	ADDITIONAL INFORMATION FOR VERTICAL PUMPS					
9.1	Type of pump					
9.2	No. of stages for Vertical Turbine Pump	Nos.				
9.3	Bowl Head	MLC				
9.4	Bowl Efficiency	%				
9.5	Setting Length	m				
9.6	Column pipe OD X Thickness	mm X mm				
9.7	No of column pieces	Nos.				
9.8	No of intermediate shafts	Nos.				
9.9	No of bearings	Nos.				
9.10	Type & make of Bearing					
9.11	Sealing/lubrication arrangement of bearings					
9.12	Capacity of overhead forced lubrication tank	m ³				
9.13	Nos of forced lubrication pumps	Nos.				
9.14	Capacity of forced lubrication pumps	m ³ /Hr				
9.15	TDH of forced lubrication pumps	MLC				

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 DATA SHEET-B MOTORS & ACTUATORS			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				
NOTES TO BIDDER 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 <div style="border: 1px solid black; padding: 5px; width: 100px; float: right;"> ISSUE R1 </div>		

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 DATA SHEET-B MOTORS & ACTUATORS			SHEET 2 OF 6
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			
NOTES TO BIDDER 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 <div style="border: 1px solid black; width: 100px; height: 100px; margin: 10px auto;"></div>		
			<div style="border: 1px solid black; padding: 2px;"> ISSUE R1 </div>		

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 DATA SHEET-B MOTORS & ACTUATORS			SHEET 4 OF 6
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			
NOTES TO BIDDER			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.			<div style="border: 1px solid black; padding: 5px; text-align: center;"> ISSUE R1 </div>		

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FORM No. PEM - 6020-2

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

NAME	DESIGNATION	SIGNATURE	DATE	COMPANY SEAL



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

SCHEDULE OF EQUIPMENT, MANUFACTURE, DESPATCH AND SHIPMENT TO SITE

SHEET _____ OF _____

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



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

SPECIFICATION	NUMBER
---------------	--------

P.O.
~~NUMBER~~

VOLUME - III PART-A

SHEET OF

[illegible]

Duration of Test / Inspection (in days)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100

PARTICULARS OF VENDOR's / AUTHORISED REPRESENTATIVE

NAME _____

SIGNATURE

DATE _____

COMPANY SEAL



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

PARTICULARS OF BIDDER / AUTHORISED REPRESENTATIVE				COMPANY SEAL
NAME	DESIGNATION	ADDRESS	TELEPHONE	

[illegible]

(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
as 1, 2 & 3
'1' stands for (BHEL)
'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.
9. The quality plan shall be submitted in septuplicate (7 Copies).



**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



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 these and additional spares considered necessary by him.

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

PARTICULARS OF BIDDER / AUTHORISED REPRESENTATIVE

NAME									
DESIGNATION									
COMPANY SEAL									

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



TITLE

*** SCHEDULE OF PRICES FOR
RECOMMENDED SPARES**

SPECIFICATION NUMBER

VOLUME III

SHEET _____ OF _____

The bidder shall give below a list of spares recommended for three years (or as otherwise specified in section - C) for trouble free performance of the equipment / system offered.

S. No.	Manufacturer's Drawing No. / Part of spare	Description	Material	Quantity per Unit / Equipment	Quantity recommended	If set, Nos. Per set	Delivery period (Weeks)	Unit Price (Rs.)	Total Price (Rs.)

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

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

SCHEDULE OF PRICE FOR ERECTION AND MAINTENANCE TOOLS & TACKLES

VOLUME III

SHEET OF

S. No	Description of Tools & Tackles	Quantity offered	Unit Price (Rs.)	Total Price (Rs.)

PARTICULARS OF BIDDER / AUTHORISED REPRESENTATIVE

COMPANY SEAL

FORM No. PEM - 6056-0



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

Sl. 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
