

**TANGEDCO  
2X660 MW ENNORE SEZ STPP  
AT ASH DYKE OF NCTPS, CHENNAI**


**TECHNICAL SPECIFICATION  
FOR SELF CLEANING STRAINERS (SCS)**

**Specification No. : PE-TS- 412-165-N003 (REV. 0).**

**VOLUME -III**



**BHARAT HEAVY ELECTRICALS LIMITED  
POWER SECTOR  
PROJECT ENGINEERING MANAGEMENT  
PPEI BLDG., SEC-16A, PLOT NO. 25  
NOIDA – 201301 (UP)**

	<b>TITLE : TECHNICAL SPECIFICATION FOR SELF CLEANING STRAINERS (SCS)  PREAMBLE</b>	<b>SPEC. NO. PE-TS- 412-165-N003</b>	
		<b>VOLUME : III</b>	
		<b>REV. NO. 0</b>	<b>DATE : 16.06.15</b>
		<b>SHEET 1 OF 1</b>	

1.0 The tender document contains three (3) volumes. The bidder shall meet the requirements of all the three volumes.

**1.1 Volume -I CONDITIONS OF CONTRACT**

This consists of four parts as below :

Volume - I A : This part contains instructions to bidders for making bids to BHEL.

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.

Volume - I C : This part contains special conditions of contract.

Volume - I D : This part contains commercial conditions for erection and commissioning site work, as applicable.

**1.2 Volume - II TECHNICAL SPECIFICATIONS**

Technical requirements are stipulated in Volume II which comprises of :

Volume - II A : General Technical Conditions

Volume - II B : Technical specification including drawings, if any

**1.2.1 Volume - II B :**

This volume is sub-divided into following sections:

Section - A : This section outlines the scope of enquiry.


Section - B : This section provides "Project Information"

Section - C : This section indicates technical requirements specific to the contract, not covered in Section-D.

Section - D : This section comprises of standard technical specifications of equipments complete with data sheet A & B.

Data sheet-A specifies data and other requirements pertaining to the equipment.


Data sheet - B specifies data to be filled by the bidder (Data Sheet B is contained in Volume - III)

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		<b>VOLUME : III</b>	
		<b>REV. NO. 0</b>	<b>DATE : 16.06.15</b>
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**1.2.2 Volume - III TECHNICAL SCHEDULES**

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 instructions given in Document No.PES-100-901 in Volume-III.

**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.

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TECHNICAL SPECIFICATION FOR  
SCS

SPEC. NO. PE-TS- 412-165-N003

VOLUME III

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## SECTION A

**SHALL BE FURNISHED ALONGWITH BID**


- COMPLIANCE CERTIFICATE
- PERFORMANCE GUARANTEE SCHEDULE
- TECHNICAL DEVIATION SCHEDULE
- ELECTRICAL LOAD DATA
- GA DRG OF SCS
- SCHEDULE OF PRICES (As per NIT)
- SCHEDULE OF UNIT PRICES (As per NIT)

	<b>TITLE : COMPLIANCE CERTIFICATE FOR SELF CLEANING STRAINERS (SCS)</b>	<b>SPEC. NO.</b>	<b>PE-TS- 412-165-N003</b>
	<b>PROJECTS:</b>	<b>DATE:</b>	16.06.15
		<b>SHEE</b>	1 OF 2
<b>2X660 MW ENNORE SEZ STPP</b>			

**COMPLIANCE CERTIFICATE**

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 with regard to same.
- b) There are no other deviations w.r.t. specification other than those furnished in the 'Schedule of Deviations'. Any other deviation, stated or implied, taken elsewhere in the offer stands withdrawn unless specifically brought out in the 'Schedule of Deviations'
- c) Bidder shall submit QP in the event of order based on the guidelines given in the specification & QP enclosed therein. QP will be subject to BHEL/ Customer/Customer's Consultant approval and 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. Charges for 3<sup>rd</sup> party inspection (TUV/ equivalent) for imported components wherever required shall be included by bidder in the base price itself.
- d) Any drawing/ document/ data-sheet/ calculation/ Quality plan/ Instrumentation etc. submitted along with the offer shall be considered for reference only, same shall be subject to BHEL/ Customer/Customer's Consultant approval in the event of order.
- e) The offered materials shall be either equivalent or superior to those specified in the specification. For components where materials are not specified, same shall be suitable for intended duty, all materials shall be subject to approval in the event of order.
- f) The commissioning spares shall be supplied on 'As Required Basis' & prices for same included in the base price itself.  
Prices for special tools & tackles, if any, shall also be included in the base price.  
Recommended spares for 3 years shall be quoted separately with price indicated separately.
- g) Charges for Installation Checks, Commissioning of equipments, Trial runs and Performance Testing at site shall be included by bidder as per the price format.
- h) All Instruments shall be located in the Instrument Rack (as applicable) to be supplied by bidder.  
  
The instrument rack shall be installed for SCS with impulse piping, root valves, fittings, accessories, valve manifolds mounted on gauge racks etc. supplied by bidder accordingly.
- i) The main flanges for SCS shall be suitable for the forces and moments as per the specification.
- j) All valves, flanges, counter-flanges, fittings, fasteners, reducer/expander & accessories etc. shall be in bidder's scope of supply.
- k) Cathodic Protection of SCS along with sacrificial Anode.
- l) The hydrostatic test pressure shall be 1.5 times the design pressure.
- m) All sub - vendors shall be subject to BHEL/ Customer/Customer's Consultant approval in the event of order.
- n) The Performance guarantees of equipments shall stand valid till the satisfactory completion of performance testing & its acceptance by BHEL/ Customer/Customer's Consultant.

	<b>TITLE : COMPLIANCE CERTIFICATE FOR SELF CLEANING STRAINERS (SCS)</b>	<b>SPEC. NO.</b>	<b>PE-TS- 412-165-N003</b>
	<b>PROJECTS:</b>  <b>2X660 MW ENNORE SEZ STPP</b>	<b>DATE:</b>	16.06.15
		<b>SHEE</b>	2 OF 2

o) The orientation of piping around SCS shall be finalised during detailed Engg.

p) Electrical/ C&I :

- All selected motor ratings have minimum 15 % margin over maximum continuous demand of the driven equipment including voltage and frequency variations, temperature rise and other factors.
- Supply of electrical viz. LT power cables, instrumentation and control cables, cable glands, lugs, cable trays etc. shall be as per specification. Their erection shall be done by BHEL
- The junction boxes for termination of DPT/ Actuator LS/ solenoid valves are included in bidders scope. The instrumentation cable and cabling from instruments/ actuators to junction boxes is also included in bidders scope.
- Valve actuators and controls shall be provided as specified in Data Sheet-A and Project specific requirements as specified in Section C-2 & Section C-3
- Alarms/ annunciations/ instruments shall be finalised during detailed engineering in the event of order which shall be subject to BHEL/ Customer/Customer's Consultant approval and shall be without any commercial implications to BHEL.



TITLE : **SCHEDULE OF PERFORMANCE GUARANTEES  
FOR  
SELF CLEANING STRAINERS (SCS)**

SPEC. NO. PE-TS- 412-165-N003


VOLUME : III

Sheet 1 of 1 Date- 16.06.15

S.NO.	DESCRIPTION	UNITS	2X660 MW ENNORE SEZ STPP
1.	Pressure drop across the Self Cleaning Strainer (i.e. between inlet & outlet nozzle) under clean condition and Normal flow condition	MWC	

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



	<b>TITLE</b> <b>* SCHEDULE OF DEVIATIONS</b> ( ) From Conditions of Contract (Volume – 1) ( ) From General Technical Conditions (Volume – II A ) ( ) From Technical Specifications (Volume –II B)	SPECIFICATION NO
		VOL III
		SHEET..... OF.....

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

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



TITLE :  
TECHNICAL SPECIFICATION FOR  
SCS

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## SECTION B

SHALL BE FURNISHED ON PLACEMENT OF LOI

- DATASHEET B
- LIST OF SCHEDULES



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**SECTION B1**  
**DATASHEET B**

	TITLE :	SPECIFICATION NO.
	DATA SHEET - B	VOLUME : III - B
	SELF - CLEANING FILTER	SECTION : B
	( Backwash Type )	REV. NO. 00      DATE :
		SHEET 1 OF 3

SL.NO.	DESCRIPTION	UNIT	DATA/ PARTICULARS
1.0	<b>GENERAL</b>		
1.1	No. of filters required	Nos.	
1.2	Inlet connection	mm Nb	
1.3	Outlet connection	mm Nb	
1.4	Filter type/ duty		
1.5	Location		
1.6	Liquid handled		
2.0	<b>DESIGN DATA</b>		
2.1	Operating pressure	Bar (g)	
2.2	Design pressure	Bar (g)	
2.3	Design temperature	Deg. C	
2.4	Flow rate through filter a) Normal b) Maximum		
2.5	Design differential pressure for filter section/ screen	Bar (g)	
2.6	Max. Size of solid particle likely to enter the filter	mm	
2.7	Type of suspended matter likely to enter the filter		
2.8	Differential pressure measuring system set pressure  • For initiating flushing/ backwashing  • For alarm/ annunciation	mbar  mbar	
2.9	Filter section/ screen perforation size	mm	
3.0	<b>GUARANTEED PERFORMANCE REQUIREMENT</b>		

	TITLE :	SPECIFICATION NO.
	DATA SHEET - B	VOLUME : III - B
	SELF - CLEANING FILTER	SECTION : B
	( Backwash Type )	REV. NO. 00      DATE :
		SHEET 2 OF 3

SL.NO.	DESCRIPTION	UNIT	DATA/ PARTICULARS
--------	-------------	------	-------------------

- |     |  |      |  |
|-----|--|------|--|
| 3.1 | Pressure drop across the filter (i.e. between inlet and outlet connection) | mbar |  |
|     | a) Clean condition   |      |  |
|     | b) Partially (50%) choked condition  |      |  |
|     | c) During flushing operation   |      |  |
|     | d) After flushing operation  |      |  |


- |     |  |                    |  |
|-----|--|--------------------|--|
| 3.2 | Debris discharge flow during flushing period |                    |  |
| 3.3 | Flushing period                              | Minutes            |  |
| 3.4 | Debris/ sludge removal capacity              | m <sup>3</sup> /hr |  |

**4.0 MATERIALS OF CONSTRUCTION**


- |     |                               |  |  |
|-----|-------------------------------|--|--|
| 4.1 | Filter body/ housing          |  |  |
| 4.2 | Filter screen/ section        |  |  |
| 4.3 | Supporting cage               |  |  |
| 4.4 | Differential measuring system |  |  |
| 4.5 | Flushing/ backwashing unit    |  |  |
| 4.6 | Backwash rotor shoes          |  |  |
| 4.7 | Internal hardware             |  |  |
| 4.8 | Pipes                         |  |  |
| 4.9 | Shaft                         |  |  |

**5.0 COUNTER FLANGES**

- |     |                   |  |  |
|-----|-------------------|--|--|
| 5.1 | Materials :       |  |  |
|     | a) Flanges        |  |  |
|     | b) Bolts & Nuts   |  |  |
|     | c) Gaskets        |  |  |
| 5.2 | Drilling Standard |  |  |


	TITLE :	SPECIFICATION NO.
	DATA SHEET - B	VOLUME : III - B
	SELF - CLEANING FILTER	SECTION : B
	( Backwash Type )	REV. NO. 00      DATE :
		SHEET 3 OF 3

SL.NO.	DESCRIPTION	UNIT	DATA/ PARTICULARS
6.0	<b>PAINTING</b>		
6.1	External Surface		
	1. Surface preparation		
	2. Primer		
	3. Final paint		
6.2	Internal Surface		
	a) Surface preparation		
	a) Primer		
	b) Final paint		
7.0	<b>SHOP TEST</b>		
7.1	Hydrostatic test		
	a) Test Pressure	bar (g)	
	b) Test duration	min.	
7.2	Lekage test		
	a) Test Pressure	bar (g)	
	b) Test duration	min.	

	TITLE	SPECIFICATION NO.
	<b>MOTOR</b>  <b>DATA SHEET - C</b>	VOLUME II B
		SECTION D
		REV NO. 00 DATE 29/08/2005
		SHEET 1 OF 2

S. No.	Description	Data to be filled by successful bidder
<b>A.</b>	<b>General</b>	
1	Manufacturer & country of origin	
2	Motor type	
3	Type of starting	
4	Name of the equipment driven by motor & Quantity	
5	Maximum Power requirement of driven equipment	
6	Rated speed of Driven Equipment	
7	Design ambient temperature	
<b>B.</b>	<b>Design and Performance Data</b>	
1	Frame size & type designation	
2	Type of duty	
3	Rated Voltage	
4	Permissible variation for	
5	a) Voltage	
6	b) Frequency	
7	c) Combined voltage & frequency	
8	Rated output at design ambient temp (by resistance method)	
9	Synchronous speed & Rated slip	
10	Minimum permissible starting voltage	
11	Starting time in sec with mechanism coupled	
12	a) At rated voltage	
13	b) At min starting voltage	
14	Locked rotor current as percentage of FLC (including IS tolerance)	
15	Torque	
	a) Starting	
	b) Maximum	
16	Permissible temp rise at rated output over ambient temp & method	
17	Noise level at 1.0 m (dB)	
18	Amplitude of vibration	
19	Efficiency & P.F. at rated voltage & frequency	
	a) At 100% load	
	c) At 75% load	

NAME OF VENDOR			SEAL	REV.	
NAME	SIGNATURE	DATE			

	TITLE	SPECIFICATION NO.
	<p style="text-align: center;"><b>MOTOR</b></p> <p style="text-align: center;"><b>DATA SHEET - C</b></p>	VOLUME II B
		SECTION D
		REV NO. 00 DATE 29/08/2005
		SHEET 2 OF 2

S. No.	Description	Data to be filled by successful bidder
	c) At starting	
<b>C.</b>	<b>Constructional Features</b>	
1	Method of connection of motor driven equipment	
2	Applicable Standard	
3	DOP of Enclosure	
4	Method of cooling	
5	Class of insulation	
6	Main terminal box	
	a) Type	
	b) Power Cable details (Conductor, size, armour/unarmour)	
	c) Cable Gland & lugs details (Size, type & material)	
	d) Permissible Fault level ( kArms & duration in sec)	
7	Space heater details (Voltage & watts)	
8	Flame proof motor details (if applicable)	
	a) Enclosure	
	b) suitability for hazardous area	
	i Zone	O / I / II
	ii Group	IIA / IIB / IIC
9	No. of Stator winding	
10	Winding connection	
11	Kind of rotor winding	
12	Kind of bearings	
13	Direction of rotation when viewed from NDE	
14	Paint Shade & type	
15	Net weight of motor	
16	Outline mounting drawing No (To be enclosed as annexure)	
<b>D.</b>	<b>Characteristic curves/ drawings</b> (To be enclosed for motors of rating $\geq 55KW$ )	
	a) Torque speed characteristic	
	b) Thermal withstand characteristic	
	c) Current vs time	
	d) Speed vs time	

NAME OF VENDOR			SEAL	REV.	
NAME	SIGNATURE	DATE			

**Explanatory notes for filling up cable list for routing through WinPath, the cable routing program (developed by Corporate R&D) being used in PEM.**

1. For the purpose of clarity, it may please be noted that the information given in regard to the cables to be routed through WinPath as per the system elaborated below is called "Cable List", while the term "Cable Schedule" applies to the cable list with routing information added after routing has been carried out.
2. The cable list shall be entered as an MS Excel file in the format as per enclosed template EXT\_CAB\_SCH\_FORMAT.XLS. No blank lines, special characters, header, footer, lines, etc. shall be introduced in the file. No changes shall be made in the title line (first line) of the template.
3. The field properties shall be as under:
  - a. UNITCABLENO: A/N, up to sixteen (16) characters; each cable shall have its own unique, unduplicated cable number. In case this rule is violated, the cable cannot be taken up for routing.
  - b. FROM: A/N, up to sixty (60) characters; the "From" end equipment/ device description and location to be specified here. Information in excess of 60 characters will be truncated after 60 characters.
  - c. TO: A/N, up to sixty (60) characters; the "To" end equipment/ device description and location to be specified here. Information in excess of 60 characters will be truncated after 60 characters.
  - d. PURPOSE: A/N, up to sixty (60) characters; the purpose (i.e. power cable/ indication/ measurement, etc.) to be specified here. Information in excess of 60 characters will be truncated after 60 characters.
  - e. REMARKS: A/N, up to forty (40) characters; Any information pertinent to routing to be specified here (e.g., cable number of the cable redundant to the cable number being entered). Information in excess of 40 characters will be truncated after 40 characters.
  - f. CABLESIZE: A/N, 7 characters exactly as per the codes indicated below shall be specified here. The program cannot route cables described in any other way/ format.
  - g. PATHCABLENO: Field reserved for utilization by the program. User shall not enter any information here.
4. One list shall be prepared for each system/ equipment (i.e., separate and unique cable lists shall be prepared for each system).
5. The cables shall be described as per the scheme listed below:

A	NN	A	NNN
Cable	No. of cores	Cable code	Cable size
Voltage Code (see B below)	(e.g. 01,03,3H, 07)	(See C below)	(e.g. 035,185,2.5, 0.5)

(A) SYSTEM VOLTAGE CODES:  
 (ac) A = 11KV, B = 6.6KV, C = 3.3KV, D = 415V, E = 240V, F = 110V  
 (dc) G = 220V, H = 110V, J = 48V, K = +24V, L = -24V

(B) CABLE VOLTAGE CODES:  
 A = 11KV (Power cables)

Explanatory notes for filling up cable list for routing through WinPath, the cable routing program (developed by Corporate R&D) being used in PEM.

- B = 6.6KV (Power cables)
- C = 3.3KV (Power cables)
- D = 1.1KV (LV & DC system power & control cables)
- E = 0.6KV (0.5 sq. mm. Control cables)

(C) CABLE CODES

PVC Copper

- A = Armoured FRLS
- B = Armoured Non-FRLS
- C = unarmoured FRLS
- D = Unarmoured Non-FRLS

PVC Aluminium

- E = Armoured FRLS
- F = Armoured Non-FRLS
- G = unarmoured FRLS
- H = Unarmoured Non-FRLS

XLPE Copper

- J = Armoured FRLS
- K = Armoured Non-FRLS
- L = unarmoured FRLS
- M = Unarmoured Non-FRLS

XLPE Aluminium

- N = Armoured FRLS
- P = Armoured Non-FRLS
- Q = unarmoured FRLS
- R = Unarmoured Non-FRLS

- S = FIRE SURVIVAL CABLES
- T = TOUGH RUBBER SHEATH
- U = OVERALL SCREENED
- V = PAIRED OVERALL SCREENED
- W = PAIRED INDIVIDUAL SCREENED
- Y = COMPENSATING CABLES
- I = PRE-FABRICATED CABLES
- Z = JELLY FILLED CABLES





TITLE :  
TECHNICAL SPECIFICATION FOR  
SCS

SPEC. NO. PE-TS- 412-165-N003

VOLUME III

SECTION

REV. NO. 0

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SHEET 1 OF 1

**SECTION B2**  
**LIST OF SCHEDULES**

**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 Occurrence 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 Occurrence 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-6057	Schedule of Daily & Overtime Rates.	
23.	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.**

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

SPECIFICATION NO:

VOL III

SHEET..... OF.....

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



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

SPECIFICATION NO:

VOL III

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Equipment/Major Bought-out items	Time for Manufacture/ Procurement from Date of issues of Letter of intent (Weeks)	Time for Test Dismantling Packing & Ready for Despatch (Weeks)	Time required fro 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 schedule in weeks fro manufacture, dispatch and shipment of each equipment and procurement of major boughtout items as listed above.

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



**SCHEDULE OF  
WEIGHTS & DIMENSIONS**

SPECIFICATION NO:

VOL III

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

Description of Package(S)	Dimension (in meters)	Weight (in tones)

PARTICULARS OF BIDDER / AUTHORISED REPRESENTATIVE

NAME	DESIGNATION	SIGNATURE	DATE	COMPANY SEAL



**INSPECTION SCHEDULE**

SPECIFICATION NO


VOL III

SHEET..... OF.....

S No.	ITEM/COMPONENT	PLACE & ADDRESS OF TEST / INSPECTION	SCHEDULE D DATE OF INSPECTION	DURATION OF TEST / INSPECTION (IN DAYS)

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

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

	<b>TITLE</b> <b>* SCHEDULE OF DEVIATIONS</b> ( ) From Conditions of Contract (Volume – 1) ( ) From General Technical Conditions (Volume – II A ) ( ) From Technical Specifications (Volume –II B)	SPECIFICATION NO
		VOL III
		SHEET..... OF.....

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

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

	<b>TITLE</b> <b>* SCHEDULE OF DECLARATIONS</b>	SPECIFICATION NO
		VOL III
		SHEET..... OF.....

\* Bidder shall include this schedule both in technical and Price offers

**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 format proposal number Dated ..... and there is no deviation to the specification.

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

Biders Company Name .....

Authorised representative's Signature .....

Name .....

Bider's Name The bidder hereby agrees to fully comply with the requirements and intent of this specification for the price indicated

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

6: ISO FORMS / P & M FORMS

Bid FORM No. PEM - 6041-0

S. NO.		QUALITY PLAN												
		COMPONENT / OPERATION	CHARACTERISTIC CHECK	CAT.	TYPE / METHOD OF CHECK	EXTENT OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORM	FORMAT OF RECORD	AGENCY			REMARKS	
		SHEET	OF	SYSTEM	CUSTOMER	PROJECT TITLE	PROJECT NUMBER	QUALITY PLAN NUMBER	SECTION	VOLUME III	P	W	V	
1		2	3	4	5	6	7	8	9	10				11
		BHEL												
		PARTICULARS											BIDDER / VENDOR	
		NAME												
		SIGNATURE												
		DATE												
													BIDDER'S / VENDOR'S COMPANY SEAL	

**INSTRUCTIONS FOR FILLING QUALITY PLAN**  
(Form No. PEM-6042 (7))

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 compiled with.
7. Inspection reports, log sheets, test reports/certificate, etc. shall be furnished to BHEL at the appropriate stages 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).



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

SPECIFICATION NO

VOL III

SHEET..... OF.....

**\*Unpriced schedule shall also be furnished along with Part A- Schedule in technical bid**

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 Recommended	If Set, Nos. Per Set	Delivery Period (Weeks)	Unit Price (Rs.)	Total Price (Rs.)
Erection & Commissioning									
Mandatory Spares									
Additional Spares Mandatory Erection / Commissioning									

**PARTICULARS OF BIDDER / AUTHORISED REPRESENTATIVE**

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



	<b>TITLE</b> <b>* SCHEDULE OF PRICE FOR ERECTION AND MAINTENANCE TOOLS &amp; TACKLES</b>	SPECIFICATION NO
		VOL III
		SHEET..... OF.....

**\*Unpriced schedule shall also be furnished along with Part A- Schedule in technical bid**  
 The bidder shall be given below the list of erection and maintenance tools and tackles as offered by him. This shall also include the customer's list of maintenance tools. If specified in Section – C / Section - D

S. No	DESCRIPTION OF TOOLS & TACKLES	QUANTITY OFFERED	UNIT PRICE (Rs.)	TOTAL PRICE (Rs.)

**NOTE :** The hire charges for vendors equipment called for in this schedule shall include the cost of consumables, operation services, descriptions, wear and tear as well as vendor's over head and profit (These rates will be payable by customer to the vendor, only if the customer's requires the use of this equipment for carrying out his own work out side the scope of this contract).

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