

2 X 500 MW NEW NEYVELI TPP (NLC LTD)

VOLUME -III

TECHNICAL SPECIFICATION
FOR
SUMP PUMPS

Specification No.: PE-TS-402-172-N001 (REV. 0)



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

PART	TITLE
A	DETAILS TO BE FURNISHED ALONGWITH THE TECHNICAL BID: <ol style="list-style-type: none"> 1. COMPLIANCE CERTIFICATE 2. TECHNICAL DEVIATION SCHEDULE 3. 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.) 4. SCHEDULE OF PRICES 5. SCHEDULE OF UNIT PRICES
B	DATA SHEET – B & LIST OF SCHEDULES (TO BE FURNISHED IN THE EVENT OF ORDER)
B1	DATA SHEET – B <ol style="list-style-type: none"> 1. PUMP DATA SHEET 2. ELECTRICAL MOTOR DATA SHEET 3. ELECTRICAL LOAD DATA SHEET
B2	LIST OF SCHEDULES



TITLE :
TECHNICAL SPECIFICATION
SUMP PUMPS

COMPLIANCE CERTIFICATE

SPECIFICATION: PE-TS-402-172-N001
NUMBER

VOLUME III
SECTION: A.1
REV-00

Date: 02.01.2015

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 deviation 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
------	-------------	-----------	------	--------------

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-TS-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-402-172-N001	
		SCHEDULE OF UNIT PRICES		VOLUME	III	
		SECTION	A 5	DATE	02.01.2015	
		REV. NO.	0	SHEET 1 OF 1		
		2X500 MW NEW NEYVELI TPP (NLC LTD)				
SL. No.	DESCRIPTIONS OF WORKS OR EQUIPMENT	PRICE (In Rs.)				
1.0	<p>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:</p> <p>a) Fixed Duty Type Submersible Pump for CW pits b) Fixed Duty Type Submersible Pump for A-Row & B-Row pits c) Portable Submersible Pump for sumps in general purpose</p>	Rs.				
2.0	<p>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.</p>					
2.0	<p>NOTES:</p> <p>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.</p> <p>b) Unit price quoted by bidder, as above, shall be binding for any quantity variation, which is at the discretion of purchaser.</p>					
<p>Bidder shall furnish this price Schedule in his price offer only</p>						
<p>PARTICULARS OF BIDDER/ AUTHORISED REPRESENTATIVE</p>						
NAME		DESIGNATION	SIGNATURE	DATE	COMPANY SEAL	



TITLE:

SPECIFICATION NO.

PE-TS-402-172-N001

SCHEDULE OF PRICES

VOLUME

III

SECTION

A 4

DATE

02.01.15

2X500 MW NEW NEYVELI TPP (NLC LTD)

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 and standard & special accessories, etc. as specified and necessary in Technical specification for following pumps :

- | | | |
|----|---|--------|
| a) | Fixed Duty Type Submersible Pump for CW pits | 4 Nos. |
| b) | Fixed Duty Type Submersible Pump for A-Row & B-Row pits | 8 Nos. |
| c) | Potable type submersible pump for general purpose | 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

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	

	TITLE	SPECIFICATION NO.
	MOTOR Data Sheet 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
A.	General	
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.	Design and Performance Data	
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.
	MOTOR Data Sheet B	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	
C.	Constructional Features	
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)	
D.	Characteristic curves/ drawings (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		

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 - 6010-0



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

--	--	--	--

Bidder shall include this schedule both in technical and Price offers.

QUALITY PLAN

COMPONENT / OPERATION	SHEET	OF		CHARACTERISTIC CHECK	CAT.	TYPE / METHOD OF CHECK	EXTENT OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORM	FORMAT OF RECORD	AGENCY			REMARKS												
		SYSTEM	ITEM								P	W	V													
2				3	4	5	6	7	8	9			10	11												
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%; text-align: center;">CUSTOMER</td> <td style="width: 25%; text-align: center;">PROJECT TITLE</td> <td style="width: 25%; text-align: center;">PACKAGE</td> <td style="width: 25%; text-align: center;">REMARKS</td> </tr> <tr> <td style="text-align: center;">BIDDER / VENDOR</td> <td style="text-align: center;">QUALITY PLAN NUMBER</td> <td style="text-align: center;">MISC. PUMPS</td> <td></td> </tr> </table>															CUSTOMER	PROJECT TITLE	PACKAGE	REMARKS	BIDDER / VENDOR	QUALITY PLAN NUMBER	MISC. PUMPS					
CUSTOMER	PROJECT TITLE	PACKAGE	REMARKS																							
BIDDER / VENDOR	QUALITY PLAN NUMBER	MISC. PUMPS																								
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%; text-align: center;">PARTICULARS</td> <td style="width: 33%; text-align: center;">BIDDER / VENDOR</td> <td style="width: 34%;"></td> </tr> <tr> <td style="text-align: center;">NAME</td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">SIGNATURE</td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">DATE</td> <td></td> <td></td> </tr> </table>															PARTICULARS	BIDDER / VENDOR		NAME			SIGNATURE			DATE		
PARTICULARS	BIDDER / VENDOR																									
NAME																										
SIGNATURE																										
DATE																										
BIDDER'S / VENDOR'S 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

--	--	--	--	--