


**1X660MW BHUSAWAL UNIT-6, T.P.S
PACKAGE-ELECTRIC LAB EQUIPMENT
ANNEXURE-A**

UNPRICED SCHEDULE

ELECTRICAL TESTING LAB EQUIPMENTS

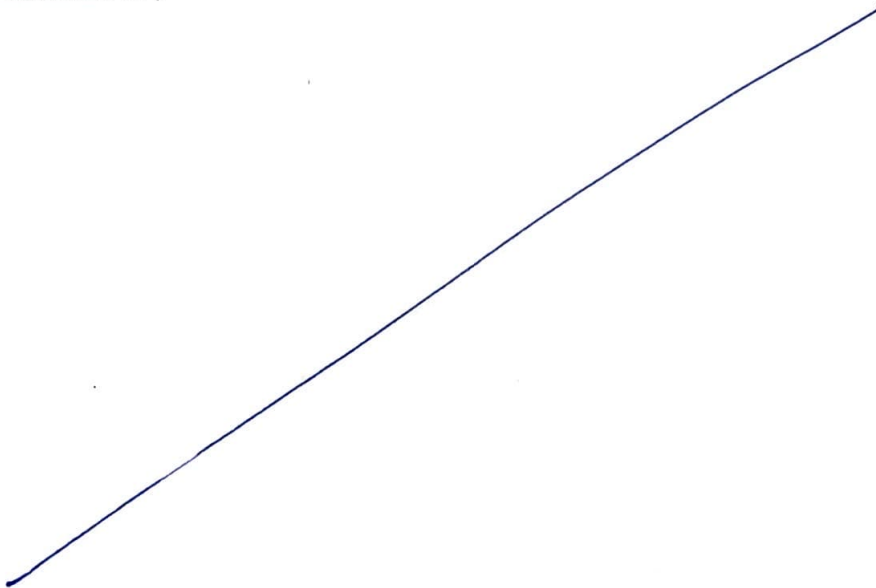
SL. NO.	CODE	ITEM DESCRIPTION	QUANTITY	UNIT	MAKE	MODEL NO.	UNIT EX-WORKS PRICE (INR)	TOTAL EX WORKS PRICE (INR)
1	556-0110146-00-A	Portable Relay Secondary Injection Testing Set	2	Nos				
2	556-0110040-00-A	Computerized relay test bench	1	Nos				
3	556-0110158-00-A	Rheostats (660V grade)						
a.		10 A /25 Ω	3	Nos				
b.		18A/6 Ω	3	Nos				
c.		5A/500 Ω	3	Nos				
d.		2.5A/500 Ω	3	Nos				
e.		1A/1000 Ω	3	Nos				
f.		5A/1000 Ω	3	Nos				
4	556-0110022-00-A	Automatic Oil Testing Set	2	Nos				
5	556-0110178-00-A	Demonstration-Man Days Rate	6	Set	Refer Note-4 below(not to be quoted)			
6	556-0110295-00-A	Demonstration-Visit Rate	3	Lot	Refer Note-4 below(not to be quoted)			
Note:-								
1	DETAILED TECHNICAL SPECIFICATION TO BE REFERRED FOR ABOVE ITEMS. EQUIPMENT TO BE SUPPLIED ALONG WITH ESSENTIAL ACCESSORIES FOR SUCCESSFUL OPERATION OF EQUIPMENT AT SITE i.e. CLAMPS, CLIPS, LEADS, INPUT/OUTPUT CABLES, CARRYING CASE etc.							
2	ALL EQUIPMENTS SHALL BE SUPPLIED WITH VALID CALIBERATION CERTIFICATE, WHEREVER APPLICABLE.							
3	ALL EQUIPMENT SHALL BE PROPERLY PACKED IN GALVANIZED SHEET STEEL TRUNK/BOX WITH PROPER LOCK & KEY ARRANGEMENT EXCEPT FOR EQUIPMENTS WHICH ARE TROLLEY MOUNTED OR ARE ALREADY AVAILABLE IN RUGGED STEEL/WOODEN BOX PACKING. FURTHER, ANY DAMAGE(READING ERROR/CALIBERATION ERROR/BROKEN PARTS etc.) FOUND ON RECEIPT AT SITE, LEADING TO REPLACEMENT OF PARTS/WHOLE ITEM, SHALL BE TO BIDDER'S ACCOUNT WITHOUT ANY COMMERCIAL IMPLICATION TO BHEL.							
4	DEMONSTRATION & HANDING OVER TO BHEL/BHEL'S CUSTOMER CHARGES SHALL BE AS PER ANNEXURE-I (SECTION-II) OF TECHNICAL SPECIFICATIONS #PE-TS-415-556-E002C							

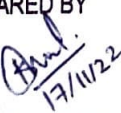
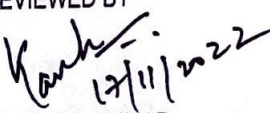
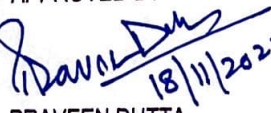

	1X660MW BHUSAWAL UNIT-6 TPS PRE-QUALIFICATION REQUIREMENTS FOR ELECTRICAL LAB (DIAGNOSTICS & CALIBRATING) EQUIPMENT	DOC. NO. PE-PQ-415-556-E002
		REVISION NO. 0 DATE 17.11.2022
		SHEET NO. 1 OF 1

ITEMS : Electrical Lab Equipment For Diagnostics and Calibrating	
SCOPE: Supply : YES; Erection & Commissioning : NO;	
1	Vendor can be either OEM (Original Equipment Manufacturer) or Supplier of Electrical Lab (Diagnostics and Calibrating) equipment.
2	Vendor should have supplied Electrical Lab (Diagnostics and Calibrating) equipment to process plant/ refinery/ power plant/ nuclear plant / testing Lab.
3	Vendor should be in business of supplying electrical lab (Diagnostics and Calibrating) equipment for at least last two (2) years from the date of techno commercial bid opening.
4	Minimum two nos. purchase orders for electrical lab (Diagnostics and Calibrating) equipment shall be submitted which should not be more than 5 years old from the date of techno-commercial bid opening for establishing continuity in business.
5	Vendor should have in-house capability to carry out testing of equipment. In case testing facility is not available with the vendor, testing can be conducted at Govt. lab/Govt. approved independent Lab.

NOTES-

1. Consideration of offer shall be subject to customer's approval of bidders, if applicable.
2. Bidder to submit all supporting documents in English. If documents submitted by bidder are in language other than English, a self-attested English translated document should also be submitted.
3. Notwithstanding anything stated above, BHEL reserves the right to assess the capabilities and capacity of the bidder to perform the contract, should the circumstances warrant such assessment in the overall interest of BHEL.
4. After satisfactory fulfilment of all the above criteria/ requirement, offer shall be considered for further evaluation as per NIT and all the other terms of the tender.



PREPARED BY  KHUSHBU AGRAWAL MANAGER	REVIEWED BY  KANHAIYA KUMAR SR MANAGER	APPROVED BY  PRAVEEN DUTTA AGM	APPROVED BY  DEBASISA RATH DH-ELECT (AGM)
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**MAHARASHTRA STATE POWER GENERATION CO. LTD.
1X660MW BHUSAWAL UNIT-6, T.P.S**

VOLUME II B

**TECHNICAL SPECIFICATION
FOR
ELECTRIC LAB EQUIPMENT**

SPECIFICATION NO.: PE-TS-415-556-E002C, REV.0



**BHARAT HEAVY ELECTRICALS LIMITED
POWER SECTOR PROJECT ENGINEERING MANAGEMENT
NOIDA, 201301**



TECHNICAL SPECIFICATION
FOR ELECTRIC LAB EQUIPMENT

Doc. No. PE-TS-415-556-E002C

Volume

Section

IIB

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	TOTAL NO. OF SHEETS= (INCLUDING COVER/ SEPARATOR SHEETS)	12



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Section

I

COMPLIANCE CERTIFICATE


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COMPLIANCE CERTIFICATE

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

1. The scope of supply, technical details, construction features, design parameters etc. shall be as per technical specification & there are no exclusion/ deviation with regard to same.
2. There are no deviation with respect to specification other than those furnished in the 'schedule of deviations'
3. Only those technical submittals which are specifically asked for in NIT to be submitted at tender stage shall be considered as part of offer. Any other submission, even if made, shall not be considered as part of offer.
4. Any comments/ clarifications on technical/ inspection requirements furnished as part of bidder's covering letter shall not be considered by BHEL, and bidder's offer shall be construed to be in conformance with the specification.
5. Any changes made by the bidder in the price schedule with respect to the description/ quantities from those given in Annexure-A [BOQ-Cum-Price schedule] of the specification shall not be considered (i.e., technical description & quantities as per specification shall prevail).
6. All essential accessories for each electrical laboratory equipment required for testing various electrical equipment /devices during Commissioning, Operation and Maintenance of power plant to be ensured by bidder in their offer.

BIDDER'S STAMP & SIGNATURE

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			Section	I
	SPECIFIC TECHNICAL REQUIREMENTS		Rev. : 0 DATE-19.03.2026	

1.0 SCOPE

- 1.1 Design, manufacture, inspection and testing at manufacturer's work, proper packing and delivery to site of Electrical Laboratory Equipment as mentioned in different sections of this specification.
- 1.2 General technical requirements of the Electrical Laboratory Equipment are indicated in Section – II. Project specific technical requirements/changes are listed in Section-I.
- 1.3 Electrical Laboratory Equipment shall be supplied along with all essential accessories required for the successful operation of the equipment.
- 1.4 Detailed technical parameters of Electrical laboratory equipment are listed in Annexure – I of Section-I.
- 1.5 The requirement of Section-I shall prevail and govern in case of conflict between the corresponding requirements of Section-I and section-II.

2.0 BILL OF QUANTITIES

- 2.1 Quantity requirement shall be as per 'BOQ cum price schedule' enclosed in NIT.
- 2.2 Supplier to also give the following undertaking in the BOM: "The BoM provided herewith completes the scope (in content and intent) of material supply under PO No. -----, dated ----- Any additional material which may become necessary for the intended application of the supplied item(s)/package will be supplied free of cost in most reasonable time."

3.0 SPECIFIC TECHNICAL REQUIREMENT

S.No.	Reference Clause No. of Section-II (if any)	Specific Requirement/Change
1	CLAUSE 1.9	In addition to the clause 1.9 of section-II, Bidder to note that "During contract stage, if it is found that the offered model is not meeting the specification requirement, bidder shall offer higher model of same make meeting specification requirement without any techno commercial implication to BHEL"

4.0 DRAWING & DOCUMENTS TO BE SUBMITTED

- 4.1 Documents/drawings for each Electrical Laboratory Equipment shall be submitted after placement of order for BHEL & customer's approval inline with NIT.



**1 X 660 MW BHUSAWAL TPS UNIT-6
TECHNICAL SPECIFICATION FOR ELECTRIC LAB
EQUIPMENT**

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IIB

Section

I

**Annexure-I of SECTION-I DETAILED TECHNICAL
PARAMETERS**

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1. Portable Relay Secondary Injection Testing Set - 2Nos

- Input: 230V/110V,
- Output current: 0-50A
- Fully automatic ,3 phase
- Able to test impedance, voltage, frequency, current, phase angle, power factor etc.
- Carry out both static and dynamic tests
- Have a 3 voltage and 3 current suitable for testing of all type relays, Varies output independently by key board
- Laptop and require software to be supplied with the kit

2. Computerized relay test bench - 1 No.

- Computerised Universal Relay testing set must be suitable to test various types of relays
- 6 phase current output
6X0-12.5A
3X0-25A
1X0-75A
- Voltage –
4X300V
1X600V
- Frequency range: 10 to 1000 Hz

3. Rheostats (660V grade) - 3 Nos of each range

Ratings

- a) 10A /25 Ω
- b) 18A /6 Ω
- c) 5A /500 Ω
- d) 2.5 A/ 500 Ω
- e) 1A /1000 Ω
- f) 5A/ 1000 Ω

4. Automatic Oil testing set: 2 No.

- Range: 0 -90KV
- Single phase with middle of HV Wdg. Earthed
- Accuracy: 1%
- For checking dielectric strength of insulating oil in transformers



TECHNICAL SPECIFICATION FOR ELECTRIC LAB EQUIPMENT

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Section

II

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SECTION-II

STANDARD TECHNICAL SPECIFICATION



TECHNICAL SPECIFICATION FOR ELECTRIC LAB EQUIPMENT

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SECTION II

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1.0 TECHNICAL REQUIREMENTS

- 1.1 Basic technical requirements for Electrical Lab Equipment shall be as indicated in this section, in addition to technical requirements specified in Section-I.
- 1.2 The intent of specification is not to specify herein all the details of design and manufacture. However, the equipment shall conform in all respect to high standards of design engineering and workmanship and shall be capable of performing in continuous commercial operation up to vendors guarantee.
- 1.3 The Bidder may note that the equipment range, rating, quantities as detailed herein, are the minimum requirement only. All accessories for the equipment not covered here, if necessary for satisfactory and trouble-free operation of the equipment, shall be quoted by the Bidder.
- 1.4 The instrument shall be suitable for satisfactory operation at an ambient temperature from 0°C to 55°C.
- 1.5 The Analog instruments shall be provided with knife-edge pointer and anti – parallax mirror.
- 1.6 The Bidder to quote only 'one' make/model against each equipment best to suit specification requirement.
- 1.7 The instrument shall be suitable for hand held operation, rugged in construction and suitable for field use.
- 1.8 All the equipment components shall be procured from reputed manufacturers and make of equipment shall be subject to the approval of BHEL/ BHEL's Customer.
- 1.9 **Bidder to note that "In case any offered make / model becomes obsolete or is stopped manufacturing by manufacturer, next higher model of the same make may be considered for ordering / supply at contract stage, without any price implication. In such cases, bidder is required to furnish valid confirmation letter from OEM as proof of change of model (citing reason: obsolete technology or stopping of manufacturing with date of effect) and that the offered model is "technically equivalent or better".**

2.0 CODES AND STANDARDS

Some of the standards, which shall generally be followed, are listed below. Other applicable relevant standards for any component part, even if not covered in listed standards shall be followed.

- i) IS – 6103 Method of test for specific resistance (resistivity) of electrical insulating fluid.
- ii) IS – 6700 Requirements of general-purpose Cathode-Ray Oscilloscope.
- iii) IS – 722 Specification for AC electricity meters.
- iv) IS – 8143 Specification for plugs & keys for resistance boxes.
- v) IS – 6104 Method of test for interfacial tension of oil against water.
- vi) IEC-51 Direct acting indicating analogue electrical measuring instruments and their accessories.



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vii) Any other relevant National/ International standards as mentioned in Section-II with technical specification.

3.0 DESIGN CRITERIA:

- 3.1 Electrical Laboratory Equipment shall be used for calibration & diagnostics of various electrical equipment/ devices during Commissioning, Operation and Maintenance of power plant.
- 3.2 The Equipment will be kept in a clean but hot, humid and tropical atmosphere when not in use. Equipment will be placed in dust laden, hot, humid atmosphere during its use.
- 3.3 For continuous operation at specified rating, temperature rise of various equipment/ components shall be limited to the permissible value stipulated in the relevant standards and this specification.

4.0 TEST REQUIREMENTS:

- 4.1 All equipment to be tested as per latest edition of relevant standards. Further, testing shall include verification of physical, functional & technical parameters of equipment & accessories, in line with approved datasheet.
- 4.2 The tests shall be carried out by the vendor at in-house lab/ OEM lab/ Third party govt. accredited lab. Charges for all these tests shall be deemed to be included in the bid price.
- 4.3 Vendor to furnish test report to BHEL for review/ acceptance. BHEL/BHEL's customer may witness the testing of equipment at Vendor works/OEM works, for which prior notice to be given to BHEL at least 7 days prior to the date of inspection, readiness of the equipment.

5.0 PACKING:

All equipment shall be properly packed in Galvanized sheet steel trunk/ box with proper lock & key arrangement except for equipment which are trolley mounted or are already available in rugged steel/wooden box packing. Further, any damage (reading error/calibration error/broken parts/missing parts etc) found on receipt at site, leading to replacement of parts/whole item, shall be to bidder's account.

6.0 DEMONSTRATION TO BHEL / BHEL'S CUSTOMER

- 6.1 The vendor shall be responsible for demonstration of the supplied equipment at site, conforming the satisfactory operation.
- 6.2 The equipment for which demonstration is required at site shall be intimated by BHEL.
- 6.3 The charges for visit to site for demonstration at site shall be in-line with Annexure- I of Section-II.



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7.0 PERFORMANCE GUARANTEE

The bidder shall guarantee that the equipment offered shall meet the requirement as stipulated in this specification and as confirmed by them in Technical Data Sheet. In case the performance of equipment is not as per performance guarantee, the bidder will have to replace the equipment at site free of cost.

8.0 DRAWING DATA & MANUAL

8.1 To be submitted with the bid as technical offer:

a) Compliance to Technical parameters of various equipment as specified in Annexure-I of Section-I in Data Sheet – B (as enclosed).

b) Technical leaflets/ Catalogues/Product Manual of the Equipment

The Bidder may note that the drawing, data and manual listed herein are minimum requirement only. The Bidder shall ensure that the other necessary write-ups, curves and information required to fully describe the equipment are submitted with the bid.

8.2 Following documents/drawings shall be submitted after placement of order for BHEL & customer's approval:

a) Technical Datasheet for each equipment

b) Technical leaflets/ Catalogues/Product Manual of the Equipment

c) Tests Reports and calibration certificate

d) General arrangement drawing showing constructional features, accessories, connections, range and rating, mounting arrangement, space requirement etc.

e) Detail instructions for application, assembly & testing of equipment.

f) Wiring and schematic diagrams (if applicable).


g) Instruction manual/ O&M manual of individual equipment

8.3 Instruction manual/O&M Manual of individual equipment

The manual shall clearly indicate in English the installation and connection method, check list of the tests to be carried out before commissioning of equipment. Maintenance and Calibration method shall also be provided in the manual.

8.4 Bidder to furnish all user instruction manuals, maintenance, handling, installation manuals & all test reports complete in all respect in bound volumes & soft copies to BHEL / BHEL's customer at the time of handing over the same to BHEL / BHEL's Customer.

8.5 Bidder to note that quoted item cost shall include cost of main item, cost of all accessories required for successful operation of equipment and testing cost of all equipment test as per relevant standard.

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	ANNEXURE-I OF SECTION – II DEMONSTRATION & HANDING OVER CHARGES	Section	II
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**SCHEDULE OF PRICES FOR DEMONSTRATION & HANDING OVER TO
BHEL / BHEL'S CUSTOMER**

SL. NO.	DETAILS	ACTIVITY	UNIT CHARGES
1	LUMP SUM ALL INCLUSIVE CHARGES PER VISIT FOR EXPERIENCED / CAPABLE ENGINEER (EXCEPT DAILY CHARGES)	1 VISIT	20000/-
2	LUMP SUM ALL INCLUSIVE CHARGES FOR EXPERIENCED / CAPABLE ENGINEER PER DAY	1 DAY	5000/-

Note:

- TOTAL CHARGES = (Charges as per S.No.1) + [No. of Days (*) x Unit Charges as per Sl. No. 2]

To be certified by BHEL site

- Bidder to note that provision of maximum 1 visit amounting to total 2 Man days is envisaged for respective bidders.

1X660MW BHUSAWAL UNIT-6, T.P.S

TECHNICAL SPECIFICATION FOR ELECTRIC LAB EQUIPMENT

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DATA SHEET-B (Annexure-II of Section-II)

NOTE :-

1) EQUIPMENT TO BE SUPPLIED ALONG WITH ESSENTIAL ACCESSORIES FOR SUCCESSFUL OPERATION OF EQUIPMENT AT SITE .i.e. CLAMPS, CLIPS, LEADS, INPUT/OUTPUT CABLES, CARRYING CASE etc.

2) ALL EQUIPMENTS SHALL BE SUPPLIED WITH VALID CALIBRATION CERTIFICATE, WHEREVER APPLICABLE.

3) All equipment shall be properly packed in Galvanized sheet steel trunk/ box with proper lock & key arrangement except for equipment which are trolley mounted or are already available in rugged steel/wooden box packing. Further, any damage (reading error/calibration error/broken parts/missing parts etc) found on receipt at site, leading to replacement of parts/whole item, shall be to bidder's account

Item description	Whether Quoted or not (Yes/No)	Make	Model no	Country of Manufacture	Authorization letter (attached or not)	Bidder to indicate the parameters of offered model against each parameter mentioned in the tender specification so that it can be concluded that offered model is meeting all requirements as specified in technical specification	Catalogue (attached or not)	Remarks
4. Automatic Oil testing set: 2 Nos.								
Range: 0 -90KV								
Single phase with middle of HV Wdg. Earthed								
Accuracy: 1%								
For checking dielectric strength of insulating oil in transformers								