E-T E N D E R S P E C I F I C A T I O N

E-Tender Specification Number: BHE/PW/PUR/NTPRT-ELE/2474

For

Electrical Package of Unit#1 and BOP of **3x800MW PVUNL Patratu Project.**

VOLUME I – TECHNICAL BID

THIS TENDER SPECIFICATION CONSISTS OF:

Notice Inviting Tender	
Volume-IA	**Technical Conditions of Contract**
Volume-IB	**Special conditions of Contract**
Volume-IC	**General conditions of Contract**
Volume-ID	**Forms & Procedures**
Volume II	**Price Bid**

Bharat Heavy Electricals Limited

(*A Government of India Undertaking*)
Power Sector - Western Region
345-Kingsway, Nagpur-440001

CONTENTS		
Volume No	Description	Hosted in website bhel.com (Briefly) and detailed in BHEL e-Procurement Portal as files titled
NIL	Tender Specification Issue Details	(Part of **Vol-IA-2474**)
NIL	Notice Inviting Tender	(Part of **Vol-IA-2474**)
I-A	Technical Conditions of Contract	Vol-I-A-2474
I-B	Special Conditions of Contract	Vol-I-BCD-2474
I-C	General Conditions of Contract	(Part of Vol-I-BCD-2474)
I-D	Forms & Procedures	(Part of Vol-I-BCD-2474)
II	Price Bid Specification as specified in E-Procurement Portal	Volume-II-2474

E-T E N D E R S P E C I F I C A T I O N

E-Tender Specification Number: BHE/PW/PUR/NTPRT-ELE/2474

For

Electrical Package of Unit#1 and BOP of **3x800MW PVUNL Patratu Project.**

EARNEST MONEY DEPOSIT: Refer Notice Inviting Tender

LAST DATE FOR TENDER SUBMISSION Refer Notice Inviting Tender

THESE TENDER SPECIFICATION DOCUMENTS CONTAINING VOLUME-I AND VOLUME- II ARE ISSUED TO:

M/s. ……

……..

PLEASE NOTE:
THESE TENDER SPECS DOCUMENTS ARE NOT TRANSFERABLE.

For Bharat Heavy Electricals Limited

AGM (Purchase)
Place: Nagpur
Date:

2474

NOTICE INVITING TENDER

Bharat Heavy Electricals Limited

Registered Office: BHEL House, Siri Fort, New Delhi – 110 049, India
Website: www.bhel.com

Date: 09/09/2021

NOTICE INVITING E-TENDER (NIT)

NOTE: BIDDER MAY DOWNLOAD/ UPLOAD THE TENDER/ OFFER FROM/ON BHEL E-PROCUREMENT PORTAL → https://eprocurebhel.co.in

To,

Dear Sir/Madam,

Sub : NOTICE INVITING E-TENDER

Sealed offers in two part bid system (National competitive bidding (NCB) ~~or International Competitive Bidding (ICB~~ are invited from reputed & experienced bidders (meeting PRE QUALIFICATION CRITERIA as mentioned in Annexure-1) for the subject job by the undersigned on the behalf of BHARAT HEAVY ELECTRICALS LIMITED as per the tender document. Following points relevant to the tender may please be noted and complied with.

1.0 Salient Features of NIT

S No.	ISSUE	DESCRIPTION	
i	**E-TENDER NUMBER**	**BHE/PW/PUR/NTPRT-ELE/2474**	
ii	**Broad Scope of job**	Electrical Package of Unit#1 and BOP of **3x800MW PVUNL Patratu Project.**	
iii	**DETAILS OF TENDER DOCUMENT**		
A	Volume-IA	*Technical Conditions of Contract (TCC) consisting of Scope of work, Technical Specification, Drawings, Procedures, Bill of Quantities, Terms of payment, etc*	*Applicable*
B	Volume-IB	*Special Conditions of Contract (SCC)*	*Applicable*
C	Volume-IC	*General Conditions of Contract (GCC)*	*Applicable*
D	Volume-ID	*Forms and Procedures*	*Applicable*
F	Volume-II	*Price Bid as specified in E-Procurement Portal*	*Applicable*
iv	**Issue of Tender Documents**	**Tender documents will be available for downloading from BHEL website (www.bhel.com) or e-procurement portal (https://eprocurebhel.co.in) as per schedule below:** ***Start :09/09/2021 , Time :15:00*** ***Closes : 23/09/2021 , Time : 13:00*** Brief information of the tenders shall also be available at central public procurement portal. (*https://eprocure.gov.in/epublish/app*)	*Applicable*
v	**DUE DATE & TIME OF OFFER SUBMISSION**	***Date: 23/09/2021, Time: 13.00 Hrs*** • ***Place: on E-Tender Portal https://eprocurebhel.co.in***	*Applicable*
vi	**OPENING OF TENDER (Techno-Commercial Bid)**	***Date: 23/09/2021, Time: 17.00 Hrs*** *Notes:* *(1) In case the due date of opening of tender becomes a non-working day, then the due date & time of offer*	*Applicable*

S No.	ISSUE	DESCRIPTION	
		submission and opening of tenders get extended to the next working day. *(2) Bidder may depute representative to witness the opening of tender. For e-Tender, Bidder may witness the opening of tender through e-Procurement portal only.*	
vii	**EMD AMOUNT**	***EMD Waived*** ~~***Important Note: Bidders kindly to take note that EMD (Earnest Money Deposit) shall be furnished by MSE bidders as well, as per the amount and procedure indicated in the NIT/GCC.***~~ ***Please Submit Bid Security Declaration Form (Annexure-13)***	*Applicable*
viii	**COST OF TENDER**	*Free*	
ix	**LAST DATE FOR SEEKING CLARIFICATION**	One day before due date of offer submission. Along with soft version also, addressing to undersigned & to others as per contact address given below: 1) Name: P R Chiwarkar Designation:GM Deptt: Purchase Address: Floor no. 5 & 6,Shree Mohini Complex, 345 Kingsway, Nagpur-440001 Phone: Landline: +91-712-2858-633 Email :prchiwarkar@bhel.in Fax:+91-712-2858600 2) Name: Tapish Kumar Designation: Dy Manager Deptt: Purchase Address: Floor no. 5 & 6,Shree Mohini Complex, 345 Kingsway, Nagpur-440001 Phone: Land Line: +91-712-2858732 Email :tapishkhandelwal@bhel.in Fax:+91-712-2858600	*Applicable*
x	**SCHEDULE OF Pre Bid Discussion (PBD)**		Not Applicable
xi	**INTEGRITY PACT & DETAILS OF INDEPENDENT EXTERNAL MONITOR (IEM)**	Sh. Arun Chandra Verma, IPS (Retd.) and Sh Virendra Bahadur Singh, IPS (Retd.)	Applicable
xii	**Latest updates**	Latest updates on the important dates, Amendments, Correspondences, Corrigenda, Clarifications, Changes, Errata, Modifications, Revisions, etc to Tender Specifications will be hosted in BHEL webpage (www.bhel.com**-->**Tender Notifications →View Corrigendum), Central Public Procurement portal (https://eprocure.gov.in/epublish/app) & on e-tender portal https://eprocurebhel.co.in **and not in the newspapers**. Bidders to keep themselves updated with all such information.	

2.0 The offer shall be submitted as per the instructions of tender document and as detailed in this NIT. Bidders to note specifically that all pages of tender document, including these NIT pages of this particular tender together with subsequent correspondences shall be submitted by them, duly signed digitally using Class III DSC & uploaded in E-Procurement Portal, as part of offer. **Rates/Price including discounts/rebates, if any, mentioned anywhere/in any form in the techno-commercial offer other than the Price Bid, shall not be entertained.**

3.0 Not Used

4.0 Unless specifically stated otherwise, bidder shall deposit EMD as per clause 1.9 of General Conditions of Contract.

For Electronic Fund Transfer the details are as below-:

NAME OF THE BENEFICIARY	BHARAT HEAVY ELECTRICALS LTD
ADDRESS OF THE COMPANY	5th Floor, SHREE MOHINI COMPLEX 345, KINGSWAY,NAGPUR
NAME OF BANK	STATE BANK OF INDIA
NAME OF BANK BRANCH AND BRANCH CODE	SBI,NAGPUR MAIN BRANCH ,CODE-00432
CITY	NAGPUR
ACCOUNT NUMBER	40227423158
ACCOUNT TYPE	MC-C C Clean (C&I)
IFSC CODE OF THE BENEFICIARY BANK BRANCH	SBIN0000432
MICR CODE OF THE BANK BRANCH	440002002

(Note -: In case of E-Tenders, proof of remittance of EMD should be uploaded in the E-Procurement Portal and originals, as applicable, shall be sent to the officer inviting tender within a reasonable time, failing which the offer is liable to be rejected.

5.0 **Procedure for Submission of Tenders**:

This is an E-tender floated online through our E-Procurement Site **(https://eprocurebhel.co.in)**. The bidder should respond by submitting their offer online only in our e-Procurement platform at **(https://eprocurebhel.co.in)**. Offers are invited in two-parts only.

Documents Comprising the e-Tender

The tender shall be submitted online ONLY EXCEPT EMD (in physical form) as mentioned below:

a. Technical Tender (UN priced Tender)

All Technical details (e.g. Eligibility Criteria requested (as mentioned below)) should be attached in e-tendering module, failing which the tender stands invalid & may be REJECTED. Bidders shall furnish the following information along with technical tender (preferably in pdf format):

- ~~**i.**~~ Earnest Money Deposit (EMD) furnished in accordance with NIT Clause 4.0. ~~Alternatively, documentary evidence for claiming exemption as per clause 29 of NIT.~~
- **ii.** Technical Bid (without indicating any prices).

b. Price Bid:

i. Prices are to be quoted in the attached Price Bid format online on e-tender portal.
ii. The price should be quoted for the accounting unit indicated in the e-tender document.

iii. Note: It is the responsibility of tenderer to go through the Tender document to ensure furnishing all required documents in addition to above, if any. Any deviation would result in REJECTION of tender and would not be considered at a later stage at any cost by BHEL.

iv. A person signing (manually or digitally) the tender form or any documents forming part of the contract on behalf of another shall be deemed to warrantee that he has authority to bind such other persons and if, on enquiry, it appears that the persons so signing had no authority to do so, the purchaser may, without prejudice to other civil and criminal remedies, cancel the contract and hold the signatory liable for all cost and damages.

v. A tender, which does not fulfil any of the above requirements and/or gives evasive information/reply against any such requirement, shall be liable to be ignored and rejected.

DO NOT'S

Bidders are requested NOT to submit the hard copy of the Bid. In case offer is sent through hard copy/fax/telex/cable/electronically in place of e-tender, the same shall not be considered. **Also, uploading of the price bid in prequalification bid or technical bid may RESULT IN REJECTION of the tender**.

Digital Signing of e-Tender

Tenders shall be uploaded with all relevant PDF/zip format. The relevant tender documents should be uploaded by an authorized person having Class 3- SHA2- 2048 BIT- SIGNING & ENCRYPTION digital signature certificate (DSC).

The Requirement:

1. A PC with Internet connectivity &
2. DSC (Digital Signature Certificate) (**Class 3- SHA2- 2048 BIT- SIGNING & ENCRYPTION**)

BHEL has finalized the e-procurement service Provider-:
NIC PORTAL (https://eprocurebhel.co.in)

For E-PROCUREMENT ASSISTANCE & TRAINING, NIC PORTAL HELPDESK CONTACTS AS PER FOLLOWING:

For any technical related queries, please call at 24 x 7 Help Desk Number
0120-4001 002
0120-4200 462
0120-4001 005
0120-6277 787
1. Peter Raj, NIC, Ph: 9942069052
Email Support: support-eproc@nic.in
Other details/update yourself from : https://eprocurebhel.co.in

The process of utilizing e-procurement necessitates usage of **DSC (Digital Signature Certificate) (Class 3- SHA2- 2048 BIT- SIGNING & ENCRYPTION)** and you are requested to procure the same immediately, if not presently available with you. Please note that only with DSC, you will be able to login the e-procurement secured site and take part in the tendering process.

The contact details of the DSC certifying authority:-
please refer http://www.mca.gov.in/ →MCA SERVICES → DSC SERVICES

Vendors are requested to go through seller manual available on https://eprocurebhel.co.in.

~~**Procedure for Submission of Tenders (To be used in case of Paper bid only):** The Tenderers must submit their Tenders to Officer inviting Tender, as detailed below:~~

- PART-I consisting of 'PART-I A (Techno Commercial Bid)' & 'PART-I B (EMD)' in two separate sealed and superscribed envelopes (ENVELOPE-I & ENVELOPE-II)
- PART-II (Price Bid) - in sealed and superscribed envelope (ENVELOPE-III)
- One set of tender documents shall be retained by the bidder for their reference

6.0 The contents for ENVELOPES and the superscription for each sealed cover/Envelope are as given below. **(All pages to be signed and stamped) (To be used in case of Paper bid only):**

Sl. no.	Description	Remarks
	Part-I A	
	ENVELOPE – I superscribed as: PART-I (TECHNO COMMERCIAL BID) TENDER NO : NAME OF WORK : PROJECT: DUE DATE OF SUBMISSION: **CONTAINING THE FOLLOWING:**	
i.	Covering letter/Offer forwarding letter of Tenderer.	
ii.	Duly filled-in `No Deviation Certificate' as per prescribed format to be placed after document under sl no (i) above. **Note:** a. In case of any deviation, the same should be submitted separately for technical & commercial parts, indicating respective clauses of tender against which deviation is taken by bidder. The list of such deviation shall be placed after document under sl no (i) above. It shall be specifically noted that deviation recorded elsewhere shall not be entertained. b. BHEL reserves the right to accept/reject the deviations without assigning any reasons, and BHEL decision is final and binding. i). In case of acceptance of the deviations, appropriate loading shall be done by BHEL ii). In case of unacceptable deviations, BHEL reserves the right to reject the tender	
iii.	Supporting documents/ annexure/ schedules/ drawing etc. as required in line with Pre-Qualification criteria. It shall be specifically noted that all documents as per above shall be indexed properly and credential certificates issued by clients shall distinctly bear the name of organization, contact ph. no, FAX no, etc.	
iv.	All Amendments/Correspondences/Corrigenda/Clarifications/Changes/ Errata etc. pertinent to this NIT.	
v.	Integrity Pact Agreement (Duly signed by the authorized signatory)	If applicable
vi.	Duly filled-in annexures, formats etc. as required under this Tender Specification/NIT	
vii.	Notice inviting Tender (NIT)	
viii.	Volume – I A : Technical Conditions of Contract (TCC) consisting of Scope of work, Technical Specification, Drawings, Procedures, Bill of	

	~~Quantities, Terms of payment, etc.~~	
~~ix.~~	~~Volume – I B : Special Conditions of Contract (SCC)~~	
~~x.~~	~~Volume – I C : General Conditions of Contract (GCC)~~	
~~xi.~~	~~Volume – I D : Forms & Procedures~~	
~~xii.~~	~~Volume – II (UNPRICED – without disclosing rates/price, but mentioning only 'QUOTED' or 'UNQUOTED' against each item~~	
~~xiii.~~	~~Any other details preferred by bidder with proper indexing.~~	

	## ~~PART-I B~~	
	~~**ENVELOPE – II superscribed as**:~~ ~~PART-I (EMD)~~ ~~TENDER NO :~~ ~~NAME OF WORK :~~ ~~PROJECT:~~ ~~DUE DATE OF SUBMISSION:~~ ~~**CONTAINING THE FOLLOWING**:-~~	
	~~Earnest Money Deposit (EMD) in the form as indicated in this Tender~~	

	## ~~PART-II~~	
	~~**PRICE BID** consisting of the following shall be enclosed~~	
	~~**ENVELOPE-III**~~ ~~superscribed as:~~ ~~PART-II (PRICE BID)~~ ~~TENDER NO :~~ ~~NAME OF WORK :~~ ~~PROJECT:~~ ~~DUE DATE OF SUBMISSION:~~ ~~**CONTAINING THE FOLLOWING**~~	
~~i~~	~~Covering letter/Offer forwarding letter of Tenderer enclosed in Part-I~~	
~~ii~~	~~Volume II – PRICE BID (Duly Filled in Schedule of Rates – rate/price to be entered in words as well as figures)~~	

	## ~~OUTER COVER~~	
	~~**ENVELOPE-IV** (MAIN ENVELOPE / OUTER ENVELOPE)~~ ~~superscribed as:~~ ~~TECHNO-COMMERCIAL BID, PRICE BID & EMD~~ ~~TENDER NO:~~ ~~NAME OF WORK:~~ ~~PROJECT:~~ ~~DUE DATE OF SUBMISSION:~~ ~~**CONTAINING THE FOLLOWING:**~~	
~~i~~	~~o Envelopes I~~ ~~o Envelopes II~~ ~~o Envelopes III~~	

- **SPECIAL NOTE: All documents/ annexures to be submitted should be uploaded in respective places in the E-Tender portal as per the list mentioned given in this NIT. BHEL shall not be responsible for any in-complete documents.**

7.0 Deviation with respect to tender clauses and additional clauses/suggestions in Techno-commercial bid / Price bid shall NOT be considered by BHEL. Bidders are requested to positively comply with the same.

8.0 BHEL reserves the right to accept or reject any or all Offers without assigning any reasons thereof. BHEL also reserves the right to cancel the Tender wholly or partly without assigning any reason thereof. Also BHEL shall not entertain any correspondence from bidders in this matter (except for the refund of EMD).

9.0 **Assessment of Capacity of Bidders**:
Bidder's capacity for executing the job under tender shall be assessed 'LOAD' wise and 'PERFORMANCE' wise as per the following:

I. **LOAD**: Load takes into consideration **ALL** the contracts of the Bidder under execution with BHEL Regions, irrespective of whether they are similar to the tendered scope or not. The cut off month for reckoning 'Load' shall be the 3rd Month preceding the month corresponding to the 'latest date of bid submission', in the following manner -
(**Note:** For example, if latest bid submission is in Jan 2017, then the 'load' shall be calculated up to and inclusive of Oct 2016)

Total number of Packages in hand = Load (P)

Where 'P' is the sum of all unit wise identified packages (refer table-1) under execution with BHEL Regions as on the cut off month defined above, including packages yet to be commenced, excepting packages which are on Long Hold.

II. **PERFORMANCE**: Here 'Monthly Performance' of the bidder for all the packages (under execution/ executed during the 'Period of Assessment' in all Power Sector Regions of BHEL) **SIMILAR** to the packages covered under the tendered scope, excepting packages not commenced shall be taken into consideration. The 'Period of Assessment' shall be 6 months preceding and including the cut off month. The cut off month for reckoning 'Period of Assessment' shall be the 3rd Month preceding the month corresponding to 'latest date of bid submission', in the following manner:
(**Note**: For example, if 'latest date of bid submission' is in Jan 2017, then the 'performance' shall be assessed for a 6 months' period up to and inclusive of Oct 2016 (i.e. from May 2016 to Oct 2016), for all the unit wise identified packages (refer Table I))

i). Calculation of Overall 'Performance Rating' for 'Similar Package/Packages' for the tendered scope under execution at Power Sector Regions for the 'Period of Assessment':

This shall be obtained by summing up the 'Monthly Performance Evaluation' scores obtained by the bidder in all Regions for all the similar Package/packages', divided by the total number of Package months for which evaluation should have been done, as per procedure below:

a) P_1, P_2, P_3, P_4, P_5, …. P_N etc. be the packages (under execution/ executed during the 'Period of Assessment' in all Regions of BHEL) **SIMILAR** to the packages covered under the tendered scope, excepting packages not commenced. Total number of similar packages for all Regions = $\mathbf{P_T}$ (i.e. $P_T = P_1 + P_2 + P_3 + P_4 + \ldots P_N$)

b) Number of Months 'T_1' for which 'Monthly Performance Evaluation' as per relevant formats, should have been done in the 'Period of Assessment' for the corresponding

similar package P_1. Similarly T_2 for package P_2,T_3 for package P_3, etc. for the tendered scope. Now calculate cumulative total months '$\mathbf{T_T}$' for total similar Packages '$\mathbf{P_T}$' for all Regions (i.e. $\mathbf{T_T} = T_1 + T_2 + T_3 + T_4 + ..T_N$)

c) Sum 'S_1 'of 'Monthly Performance Evaluation' Scores ($S_{1\text{-}1}$, $S_{1\text{-}2}$, $S_{1\text{-}3}$, $S_{1\text{-}4}$, $S_{1\text{-}5}$…. $S_{1\text{-}T1}$) for similar package P_1, for the 'period of assessment' 'T_1' (i.e. $S_1 = S_{1\text{-}1} + S_{1\text{-}2} + S_{1\text{-}3} + S_{1\text{-}4} + S_{1\text{-}5} + ...S_{1\text{-}T1}$). Similarly, S_2 for package P_2 for period T_2, S_3 for package P_3 for period T_3 etc. for the tendered scope for all Regions. Now calculate cumulative sum 'S_T' of 'Monthly Performance Evaluation' Scores for total similar Packages '$\mathbf{P_T}$' for all Regions (i.e. 'S_T '= $S_1 + S_2 + S_3 + S_4 + S_5 + ... S_N$.)

d) **Overall Performance Rating 'R_{BHEL}' for the Similar Package/Packages** (under execution/ executed during the 'Period of Assessment') in all the Power Sector Regions of BHEL

$$= \frac{\text{Aggregate of Performance scores for all similar packages in all the Regions}}{\text{Aggregate of months for each of the similar packages for which performance should have been evaluated in all the Regions}}$$

$$= \frac{S_T}{T_T}$$

e) Bidders to note that the risk of non-evaluation or non-availability of the 'Monthly Performance Evaluation' reports as per relevant formats is to be borne by the Bidder.

f) Table showing methodology for calculating 'a', 'b' and 'c' above

Sl. No.	Item Description	Details for all Regions							Total
(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)	(x)
1	Similar Packages for all Regions → (under execution/ executed during period of assessment)	P_1	P_2	P_3	P_4	P_5	…	P_N	Total No. of similar packages for all Regions = $\mathbf{P_T}$ i.e. Sum (Σ) of columns (iii) to (ix)
2	Number of Months for which 'Monthly Performance Evaluation' as per relevant formats should have been done in the 'period of assessment' for corresponding Similar Packages (as in row 1)	T_1	T_2	T_3	T_4	T_5	…	T_N	Sum (Σ) of columns (iii) to (ix) = $\mathbf{T_T}$

Sl. No.	Item Description	Details for all Regions							Total
(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)	(x)
3	Monthly performance scores for the corresponding period (as in Row 2)	S_{1-1}, S_{1-2}, S_{1-3}, S_{1-4}, ... S_{1-T1}	S_{2-1}, S_{2-2}, S_{2-3}, S_{2-4}, ... S_{2-T2}	S_{3-1}, S_{3-2}, S_{3-3}, S_{3-4}, ... S_{3-T3}	S_{4-1}, S_{4-2}, S_{4-3}, S_{4-4}, ... S_{4-T4}	S_{5-1}, S_{5-2}, S_{5-3}, S_{5-4}, ... S_{5-T5}	.. ..	S_{N-1}, S_{N-2}, S_{N-3}, S_{N-4}, ... S_{N-TN}	--------
4	Sum of Monthly Performance scores of the corresponding Package for the corresponding period (as in row-3)	S_1	S_2	S_3	S_4	S_5	...	S_N	Sum (Σ) of columns (iii) to (ix) = $\mathbf{S_T}$

ii). Calculation of Overall 'Performance Rating' ($\mathbf{R_{BHEL}}$) in case at least 6 evaluation scores for 'similar Package/Packages' for the tendered scope ARE NOT AVAILABLE, during the 'Period of Assessment':

This shall be obtained by summing up the 'Monthly Performance Evaluation' scores obtained by the bidder in all Regions for ALL the packages, divided by the total number of Package months for which evaluation should have been done. 'R_{BHEL}' shall be calculated subject to availability of 'performance scores' for at least 6 'package months' in the order of precedence below:

a) 'Period of Assessment' i.e. 6 months preceding and including the cut-off month
b) 12 months preceding and including the cut-off month
c) 24 months preceding and including the cut-off month

In case, R_{BHEL} cannot be calculated as above, then Bidder shall be treated as 'NEW VENDOR'. Further eligibility and qualification of this bidder shall be as per definition of 'NEW VENDOR' described in 'Explanatory Notes'.

iii). Factor "L" assigned based on Overall Performance Rating (R_{BHEL}) at Power Sector Regions:

Sl. no.	Overall Performance Rating (R_{BHEL})	Corresponding value of 'L'
1	=60	NA
2	> 60 and ≤ 65	0.4
3	> 65 and ≤ 70	0.35
4	> 70 and ≤ 75	0.25
5	> 75 and < 80	0.2
6	≥ 80	NA

III. 'Assessment of Capacity of Bidder':

'Assessment of Capacity of Bidder' is based on the Maximum number of packages for which a vendor is eligible, considering the performance scores of similar packages, as below:

Max number of packages P_{Max}= (R_{BHEL} - 60) divided by corresponding value of 'L', i.e. (R_{BHEL}-60)/L

Note:

i). In case the value of P_{Max} results in a fraction, the value of P_{Max} is to be rounded off to next whole number
ii). For R_{BHEL} = 60, P_{Max} = '1'
iii). For R_{BHEL} ≥ 80, there will be no upper limit on P_{Max}

The Bidder shall be considered 'Qualified' as per 'Assessment of Capacity of Bidder' for the subject Tender if $P \leq P_{Max}$
(Where P is calculated as per clause 'I' above)

IV. **Explanatory note**:

i). Similar package means Boiler or ESP or Piping or Turbine or Civil or Structure or Electrical or C&I etc. at the individual level irrespective of rating of Plant and irrespective of whether the subject tender is a single package or as part of combined/composite packages. Normally Boiler, ESP, Piping, Turbine, Electrical, C&I, Civil, Structure etc. is considered individual level of package. For example, in case the tendered scope is a Boiler Vertical Package comprising of Boiler, ESP and Power Cycle Piping (i.e. the 'identified packages as per Table-1 below), the 'PERFORMANCE' part against sl.no. II above, needs to be evaluated considering all the identified packages (i.e. Boiler, ESP and Power Cycle Piping) and finally the Bidder's capacity to execute the tendered scope is assessed in line with III above.

ii). Identified Packages (Unit wise)

Table-1

Civil	Electrical and C&I	Mechanical
i). Enabling works ii). Pile and Pile Caps iii). Civil Works including foundations iv). Structural Steel Fabrication & Erection v). Chimney vi). Cooling Tower vii). Others (Civil)	i). Electrical ii). C&I iii). Others (Elect. and C&I)	i). Boiler & Aux (All types including CW Piping if applicable) ii). Power Cycle Piping/Critical Piping iii). ESP iv). LP Piping v). Steam Turbine Generator set & Aux vi). Gas Turbine Generator set & Aux vii). Hydro Turbine Generator set & Aux viii). Turbo Blower (including Steam Turbine) ix). Material Management x). FGD xi). ACC xii). Others (Mechanical)

iii). Bidders who have not been evaluated for at least six package months in the last 24 months preceding and including the Cut-off month in the online BHEL system for contractor performance evaluation in BHEL PS Regions, shall be considered "NEW VENDOR".

A 'NEW VENDOR' shall be considered qualified subject to satisfying all other tender conditions.

A 'NEW VENDOR' if awarded a job (of package/packages identified under this clause) shall be tagged as "FIRST TIMER" on the date of first LOI from BHEL.

The "FIRST TIMER" tag shall remain till completion of all the contracts against which vendor has been tagged as First Timer or availability of 6 evaluation scores within last 24 months

preceding and including the Cut-off month in the online BHEL system for contractor performance evaluation in BHEL PS Regions.

A Bidder shall not be eligible for the next job as long as the Bidder is tagged as "FIRST TIMER" excepting for the Tenders which have been opened on or before the date of the bidder being tagged as 'FIRST TIMER'.

After removal of 'FIRST TIMER' tag, the Bidder shall be considered 'QUALIFIED' for the future tenders subject to satisfying all other tender conditions including 'Assessment of Capacity of Bidders'.

iv). Consequent upon applying the criteria of 'Assessment of Capacity of Bidders' detailed above on all the bidders qualified against Technical and Financial Qualification criteria, if the number of qualified bidders reduces to less than minimum no. of bidders required for conducting RA as per extant RA Guidelines, then for further processing of the Tender, BHEL at its discretion reserves the right to also consider the bidders who are "not qualified" as per criteria of 'Assessment of Capacity of Bidders' and for this, procedure described in following three options shall be followed:

a) All the bidders having Overall Performance Rating ('R_{BHEL}') ≥60 shall be considered qualified against criteria of 'Assessment of Capacity of Bidders'.
b) If even after using option "a", the number of qualified bidders remains less than minimum no. of bidders required for conducting RA as per extant RA Guidelines, then in addition to bidders considered as per option "a", "First timer" bidders having average of available performance scores ≥60 upto and including the Cut Off month shall also be considered qualified against criteria of 'Assessment of Capacity of Bidders'.
c) If even after using option "a" and "b", the number of qualified bidders remains less than minimum no. of bidders required for conducting RA as per extant RA Guidelines, then in addition to bidders considered as per option "a" and "b", "First timer" bidders for whom no performance score is available in the system upto and including the Cut Off month, shall also be considered qualified against criteria of 'Assessment of Capacity of Bidders'.

Note:- In case, the number of bidders qualified against Technical and Financial Qualification criteria itself is less than minimum no. of bidders required for conducting RA as per extant RA Guidelines, then all bidders (a)- having Overall Performance Rating ('R_{BHEL}') ≥60, (b)- First timer" bidders having average of available performance scores ≥60 upto and including the Cut Off month, (c)- "First timer" bidders for whom no performance score is available in the system upto and including the Cut Off month, shall be considered qualified against criteria of 'Assessment of Capacity of Bidders' for further processing of tender.

v). 'Under execution' shall mean works in progress as per the following:
a. Up to execution of 90% of anticipated Contract Value in case of Civil, MM, Structural and Turbo Blower Packages
b. Up to Steam Blowing in case of Boiler/ESP/Piping Packages
c. Up to Synchronization in all Balance Packages

Note: BHEL at its discretion can extend (or reduce in exceptional cases in line with Contract conditions) the period defined against (a), (b) and (c) above, depending upon the balance scope of work to be completed.

vi). Contractor shall provide the latest contact details i.e. mail-ID and Correspondence Address to SCT Department, so that same can be entered in the Contractor Performance Evaluation System, and in case of any change/discrepancy same shall be informed immediately. Login

Details for viewing scores in Contractor Performance Evaluation System shall be provided to the Contractor by SCT Department.

vii). Performance Evaluation for Activity Month shall be completed in Evaluation Month (i.e. month next to Activity Month) or in rare cases in Post Evaluation Month (i.e. month next to Evaluation Month) after approval from Competent Authority. In case scores are not acceptable, Contractor can submit Review Request to GM Site/ GM Project latest by 27th of Evaluation Month or 5 days after approval of score, whichever is later. However, acceptance/rejection of 'Review Request' solely depends on the discretion of GM Site/GM Project. After acceptance of Review Request, evaluation score shall be reviewed at site and the score after completion of review process shall be acceptable and binding on the contractor.

viii). Project on Hold due to reasons not attributable to bidder -

a. **Short hold:** Evaluation shall not be applicable for this period, however Loading will be considered.

b. **Long hold:** Short hold for continuous six months and beyond or hold on account of Force Majeure shall be considered as Long Hold. Evaluation as well as Loading shall not be considered for this period.

ix). Performance evaluation as specified above in this clause is applicable to Prime bidder and Consortium partner (or Technical tie up partner) for their respective scope of work.

10.0 Since the job shall be executed at site, bidders must visit site/ work area and study the job content, facilities available, availability of materials, prevailing site conditions including law & order situation, applicable wage structure, wage rules, etc. before quoting for this tender. They may also consult this office before submitting their offers, for any clarifications regarding scope of work, facilities available at sites or on terms and conditions.

11.0 For any clarification on the tender document, the bidder may seek the same in writing or through e-mail and/or through e-procurement portal, as per specified format, within the scheduled date for seeking clarification, from the office of the undersigned. BHEL shall not be responsible for receipt of queries after due date of seeking clarification due to postal delay or any other delays. Any clarification / query received after last date for seeking clarification may not be normally entertained by BHEL and no time extension will be given.

12.0 BHEL may decide holding of pre-bid discussion [PBD] with all intending bidders as per date indicated in the NIT. The bidder shall ensure participation for the same at the appointed time, date and place as may be decided by BHEL. Bidders shall plan their visit accordingly. The outcome of pre-bid discussion (PBD) shall also form part of tender.

13.0 In the event of any conflict between requirement of any clause of this specification/ documents/drawings/data sheets etc. or requirements of different codes/standards specified, the same to be brought to the knowledge of BHEL in writing for clarification before due date of seeking clarification (whichever is applicable), otherwise, interpretation by BHEL shall prevail. Any typing error/missing pages/ other clerical errors in the tender documents, noticed must be pointed out before pre-bid meeting/submission of offer, else BHEL's interpretation shall prevail.

14.0 Unless specifically mentioned otherwise, bidder's quoted price shall deemed to be in compliance with tender including PBD.

15.0 Bidders shall submit Integrity Pact Agreement (Duly signed by authorized signatory who signs in the offer), **if applicable**, along with techno-commercial bid. This pact shall be considered as a preliminary qualification for further participation. **The names and other details of Independent External Monitor (IEM) for the subject tender is as given at point (1) above.**

"Integrity Pact (IP)"

(a) IP is a tool to ensure that activities and transactions between the Company and its Bidders/ Contractors are handled in a fair, transparent and corruption free manner. Following Independent External Monitors (IEMs) on the present panel have been appointed by BHEL with the approval of CVC to oversee implementation of IP in BHEL.

Sl. No.	IEM	Email
1.	Shri Arun Chandra Verma, IPS (Retd.)	acverma1@gmail.com
2.	Shri Virendra Bahadur Singh, IPS (Retd.)	vbsinghips@gmail.com

(b) The IP as enclosed with the tender is to be submitted (duly signed by authorized signatory) along with techno-commercial bid (Part-I, in case of two/ three part bid). Only those bidders who have entered into such an IP with BHEL would be competent to participate in the bidding. In other words, entering into this Pact would be a preliminary qualification.

(c) Please refer Section-8 of IP for Role and Responsibilities of IEMs. In case of any complaint arising out of the tendering process, the matter may be referred to any of the above IEM(s). All correspondence with the IEMs shall be done through email only.

Note:

No routine correspondence shall be addressed to the IEM (phone/ post/ email) regarding the clarifications, time extensions or any other administrative queries, etc. on the tender issued. All such clarification/ issues shall be addressed directly to the tender issuing (procurement) department's officials whose contact details are provided below:

Details of contact person(s):

Name: (1) P R Chiwarkar/ GM (Purchase) 2) Tapish kumar / Dy Manager (Purchase)
Dept.: Purchase Department
Address: Floor No. 5 & 6, Shreemohini Complex, 345 Kingsway, Nagpur-440001
Phone: (LL/ Mobile) (1) 0712-2858633 0712-2858732
Email: prchiwarkar@bhel.in tapishkhandelwal@bhel.in
Fax: 0712-2858699

16.0 The Bidder has to satisfy the Pre-Qualifying Requirements stipulated for this Tender in order to be qualified. The Price Bids of only those bidders will be opened who will be qualified for the subject job on the basis of satisfying the Pre-Qualification Criteria specified in this NIT as per Annexure-I (as applicable), past performance etc. and date of opening of price bids shall be intimated to only such bidders. BHEL reserves the right not to consider offers of parties under HOLD.

17.0 In case BHEL decides on a `Public Opening', the date & time of opening of the sealed PRICE BID shall be intimated to the qualified bidders and in such a case, bidder may depute one authorized representative to witness the price bid opening. BHEL reserves the right to open 'in-camera' the 'PRICE BID' of any or all Unsuccessful/Disqualified bidders under intimation to the respective bidders.

18.0 Validity of the offer shall be for **six months** from the latest due date of offer submission (including extension, if any) unless specified otherwise.

19.0 **Reverse Auction:** Applicable. "BHEL shall be resorting to Reverse Auction (RA) (Guidelines as available on www.bhel.com on "**supplier registration page".**) for this tender. RA shall be conducted among all the techno-commercially qualified bidders.

Price Bids of all the techno-commercially qualified bidders shall be opened and same shall be considered as initial bids of bidders in RA. In case any bidder(s) do(es) not participate in online Reverse Auction, their sealed envelope price bid along with applicable loading, if any, shall be considered for ranking.

20.0 On submission of offer, further consideration will be subject to compliance to tender & qualifying requirement and customer's acceptance, as applicable.

21.0 In case the bidder is an "Indian Agent of Foreign Principals", 'Agency agreement has to be submitted along with Bid, detailing the role of the agent along with the terms of payment for agency commission in INR, along with supporting documents.

22.0 The bidders shall not enter into any undisclosed M.O.U. or any understanding amongst themselves with respect to tender.

23.0 ~~Consortium Bidding (or Technical Tie up) shall be allowed only if specified in Pre-Qualifying Requirement (PQR) criteria, and in such a case the following shall be complied with:~~

~~23.1 Prime Bidder and Consortium Partner or partners are required to enter into a consortium agreement for the said contract with a validity period of six months initially. In case bidder becomes L1, Consortium Agreement valid till contractual completion period shall be submitted to BHEL before signing the contract. Consortium Agreement shall be kept valid till scope of work awarded to consortium partner(s) as per contract is completed.~~

~~23.2 'Standalone' bidder cannot become a '**Prime Bidder' or a 'Consortium bidder' or 'Technical Tie up bidder' in a consortium (or Technical Tie up) bidding**. Prime bidder shall neither be a consortium partner to other prime bidder nor take any other consortium partners. However, consortium partner may enter into consortium agreement with other prime bidders. In case of non-compliance, consortium bids of such Prime bidders will be rejected.~~

~~23.3 Number of partners for a Consortium Bidding (or Technical Tie up) including Prime Bidder shall be NOT more than 3 (three).~~

~~23.4 Prime Bidder shall be as specified in the Pre-Qualification Requirement, else the bidder who has the major share of work.~~

~~23.5 In order to be qualified for the tender, Prime Bidder and Consortium partner or partners shall satisfy (i) the Technical 'Pre-Qualifying Requirements' specified for the respective package, (ii) "Assessment of Capacity of Bidder' as specified in clause 9.0.~~

~~23.6 Prime Bidder shall comply with additional 'Technical' criteria of PQR as defined in 'Explanatory Notes for the PQR'.~~

~~23.7 Prime Bidder shall comply with all other Pre-Qualifying criteria for the Tender unless otherwise specified~~

~~23.8 In case customer approval is required, then Prime Bidder and Consortium Partner or partners shall have to be individually approved by Customer for being considered for the tender.~~

~~23.9 Prime Bidder shall be responsible for the overall execution of the contract.~~

~~23.10 In case of award of job, Performance shall be evaluated for Prime Bidder and Consortium Partner or partners for their respective scope of work(s) as per prescribed formats.~~

~~23.11 In case the Consortium partner or partners back out, their SDs shall be encashed by BHEL and BHEL shall take necessary action as per extant guidelines. In such a case, other consortium partner or partners meeting the PQR have to be engaged by the Prime Bidder, and if not, the respective work will be withdrawn and executed on risk and cost basis of the Prime Bidder. The new consortium partner or partners shall submit fresh SDs as applicable.~~

~~23.12 In case Prime Bidder withdraws or insolvency / liquidation / winding up proceedings have been initiated / admitted against the Prime Bidder, BHEL reserves the right to cancel, terminate or short close the contract or take any other action to safeguard BHEL's interest in the Project / Contract. This action will be without prejudice to any other action that BHEL can take under Law and the Contract to safeguard interests of BHEL.~~

~~23.13 After execution of work, the work experience shall be assigned to the Prime Bidder and the consortium partner or partners for their respective scope of work. After successful execution of one work with a consortium partner under direct order of BHEL, the Prime Bidder shall be eligible for becoming a 'standalone' bidder for works similar to that for which consortium partner was engaged, for subsequent tenders.~~

~~23.14 The consortium partner shall submit SD equivalent to 1% of the total contract value in addition to the SD to be submitted by the Prime Bidder for the total contract value. In case there are two consortium partners, then each partner shall submit SD equivalent to 0.5% of the total contract value in addition to the SD to be submitted by the Prime Bidder for the total contract value. However, Prime Bidder has also option for submission of SD on behalf of consortium partner (s).~~

~~SD submitted by Consortium Partner(s) may be released in case corresponding scope of work of the respective Consortium partner(s) has been completed upto the extent of 80% based on certification by Construction Manager and concurrence by the prime bidder.~~

~~23.15 In case of a Technical Tie up, all the clauses applicable for the Consortium partner shall be applicable for the Technical Tie up partner also.~~

24.0 The bidder shall submit/upload documents in support of possession of 'Qualifying Requirements' duly self-certified and stamped by the authorized signatory, indexed and properly linked in the format for PQR. In case BHEL requires any other documents/proofs, these shall be submitted immediately.

25.0 The bidder may have to produce original document for verification if so decided by BHEL.

26.0 The consultant / firm (and any of its affiliates) shall not be eligible to participate in tender(s) for the related works or services for the same project, if they were engaged for the consultancy services.

27.0 Guidelines/rules in respect of Suspension of Business dealings, Vendor evaluation format, Quality, Safety & HSE guidelines, Experience Certificate, etc. may undergo change from time to time and the

latest one shall be followed. The abridged version of extant 'Guidelines for suspension of business dealings with suppliers/ contractors' is available on www.bhel.com on "**supplier registration page**".

28.0 The offers of the bidders who are on the banned/ hold list and also the offer of the bidders, who engage the services of the banned/ hold firms, shall be rejected. The list of **banned/ hold firms** is available on BHEL web site www.bhel.com.

28.1 Integrity commitment, performance of the contract and punitive action thereof:

28.1.1 **Commitment by BHEL:**

BHEL commits to take all measures necessary to prevent corruption in connection with the tender Process and execution of the contract. BHEL will during the tender process treat all Bidder(s) in a transparent and fair manner, and with equity.

28.1.2 **Commitment by Bidder/ Supplier/ Contractor:**

(i) The bidder/ supplier/ contractor commit to take all measures to prevent corruption and will not directly or indirectly influence any decision or benefit which he is not legally entitled to nor will act or omit in any manner which tantamount to an offence punishable under any provision of the Indian Penal Code, 1860 or any other law in force in India.

(ii) The bidder/ supplier/ contractor will, when presenting his bid, disclose any and all payments he has made, and is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract and shall adhere to relevant guidelines issued from time to time by Govt. of India/ BHEL.

(iii) The bidder/ supplier/ contractor will perform/ execute the contract as per the contract terms & conditions and will not default without any reasonable cause, which causes loss of business/ money/ reputation, to BHEL.

If any bidder/ supplier/ contractor during pre-tendering/ tendering/ post tendering/ award/ execution/ post-execution stage indulges in mal-practices, cheating, bribery, fraud or and other misconduct or formation of cartel so as to influence the bidding process or influence the prices or acts or omits in any manner which tantamount to an offence punishable under any provision of the Indian Penal Code, 1860 or any other law in force in India, then, action may be taken against such bidder/ supplier/ contractor as per extent guidelines of the company available on www.bhel.com and / or under applicable legal provisions.

29.0 ~~Micro and Small Enterprises (MSE)~~

~~Any Bidder falling under MSE category, shall furnish the following details & submit documentary evidence/ Govt. Certificate etc. in support of the same along with their techno-commercial offer.~~

~~Type under MSE~~	~~SC/ST owned~~	~~Women owned~~	~~Others (excluding SC/ ST & Women~~
~~Micro~~			
~~Small~~			

~~**Note:** - If the bidder does not furnish the above, offer shall be processed construing that the bidder is not falling under MSE category.~~

~~*a)* MSE suppliers can avail the intended benefits in respect of the procurements related to the Goods and Services only (Definition of Goods and Services as enumerated by Govt. of India vide Office Memorandum F. No. 21(8)/2011-MA dtd. 09/11/2016 office of AS & DC, MSME) only if they submit along with the offer, attested copies of either Udyam Registration Certificate or EM-II certificate having deemed validity (five years from the date of issue of acknowledgement in EM-II) or valid NSIC certificate or Udyog Aadhar Memorandum (UAM) & Acknowledgement or EM-II Certificate along with attested copy of a CA certificate (**format enclosed as Annexure – 3**)~~

~~where deemed validity of EM-II certificate of five years has expired applicable for the relevant financial year (latest audited). Date to be reckoned for determining the deemed validity will be the last date of Technical Bid submission. Non submission of such documents will lead to consideration of their bids at par with other bidders. No benefits shall be applicable for this enquiry if the above required documents are not submitted before price bid opening. If the tender is to be submitted through e-procurement portal, then the above required documents are to be uploaded on the portal. Documents should be notarized or attested by a Gazetted officer. Documents submitted by the bidder may be verified by BHEL for rendering the applicable benefits.~~

30.0 The Bidder along with its associate/ collaborators/ sub-contractors/ sub-vendors/ consultants/ service providers shall strictly adhere to BHEL Fraud Prevention Policy displayed on BHEL website http://www.bhel.com and shall immediately bring to the notice of BHEL Management about any fraud or suspected fraud as soon as it comes to their notice.

31.0 **PREFERENCE TO MAKE IN INDIA:**

For this procurement, the local content to categorize a supplier as a Class I local supplier/ Class II local Supplier/Non-Local Supplier and purchase preferences to Class I local supplier, is as defined I Public Procurement (Preference to Make in India), Order 2017 dated 04.06.2020 issued by DPIIT. In case of subsequent orders issued by the nodal ministry, changing the definition of local content for the items of the NIT, the same shall be applicable even if issued after issue of this NIT, but before opening of Part-II bids against this NIT.

31.1 ***Compliance to Restrictions under Rule 144 (xi) of GFR 2017***

I. Any bidder from a country which shares a land border with India will be eligible to bid in this tender only if the bidder is registered with the Competent Authority. The Competent Authority for the purpose of this Clause shall be the Registration Committee constituted by the Department for Promotion of Industry and Internal Trade (DPIIT).

II. "Bidder" (including the term 'tenderer', 'consultant' or 'service provider' in certain contexts) means any person or firm or company, including any member of a consortium or joint venture (that is an association of several persons, or firms or companies), every artificial juridical person not falling in any of the descriptions of bidders stated hereinbefore, including any agency branch or office controlled by such person, participating in a procurement process.

III. "Bidder from a country which shares a land border with India" for the purpose of this Clause means: -

a. An entity incorporated established or registered in such a country; or
b. A subsidiary of an entity incorporated established or registered in such a country; or
c. An entity substantially controlled through entities incorporated, established or registered in such a country; or
d. An entity whose beneficial owner is situated in such a country; or
e. An Indian (or other) agent of such an entity; or
f. A natural person who is a citizen of such a country; or
g. A consortium or joint venture where any member of the consortium or joint venture falls under any of the above

IV. The beneficial owner for the purpose of (III) above will be as under:

1. *In case of a company or Limited Liability Partnership, the beneficial owner is the natural person(s), who, whether acting alone or together or through one or more juridical person, has a controlling ownership interest or who exercises control through other means.*
   Explanation
   a. *"Controlling ownership interest" means ownership of or entitlement to more than twenty-five per cent of shares or capital or profits of the company.*
   b. *"Control" shall include the right to appoint majority of the directors or to control the management or policy decisions including by virtue of their shareholding or management rights or shareholders agreements or voting agreements.*
2. *In case of a partnership firm, the beneficial owner is the natural person(s) who, whether acting alone or together, or through one or more juridical person, has ownership of entitlement to more than fifteen percent of capital or profits of the partnership.*
3. *In case of an unincorporated association or body of individuals, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person has ownership of or entitlement to more than fifteen percent of the property or capital or profits of the such association or body of individuals.*
4. *Where no natural person is identified under (1) or (2) or (3) above, the beneficial owner is the relevant natural person who holds the position of senior managing official;*
5. *In case of a trust, the identification of beneficial owner(s) shall include identification of the author of the trust, the trustee, the beneficiaries with fifteen percent or more interest in the trust and any other natural person exercising ultimate effective control over the trust through a chain of control or ownership.*

V. *An Agent is a person employed to do any act for another, or to represent another in dealings with third person.*

VI. *The successful bidder shall not be allowed to sub-contract works to any contractor from a country which shares a land border with India unless such contractor is registered with the Competent Authority.*

Note:

(i) *The bidder shall provide undertaking for their compliance to this Clause, in the Format provided in Annexure-11.*

(ii) *Registration of the bidder with Competent Authority should be valid at the time of submission as well as acceptance of the bids.*

32.0 Bid should be free from correction, overwriting, using corrective fluid, etc. Any interlineation, cutting, erasure or overwriting shall be valid only if they are attested under full signature(s) of person(s) signing the bid else bid shall be liable for rejection.
All overwriting/cutting, etc., will be numbered by bid opening officials and announced during bid opening.

33.0 In the course of evaluation, if more than one bidder happens to occupy L-1 status, effective L-1 will be decided by soliciting discounts from the respective L-1 bidders.

In case more than one bidder happens to occupy the L-1 status even after soliciting discounts, the L-1 bidder shall be decided by a toss/ draw of lots, in the presence of the respective L-1 bidder(s) or their representative(s).

Ranking will be done accordingly. BHEL's decision in such situations shall be final and binding.

34.0 The Bidder declares that they will not enter into any illegal or undisclosed agreement or understanding, whether formal or informal with other Bidder(s). This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.

In case, the Bidder is found having indulged in above activities, suitable action shall be taken by BHEL as per extant policies/ guidelines.

35.0 Order of Precedence:

In the event of any ambiguity or conflict between the Tender Documents, the order of precedence shall be in the order below:

a. Amendments/Clarifications/Corrigenda/Errata etc. issued in respect of the tender documents by BHEL
b. Notice Inviting Tender (NIT)
c. Price Bid
d. Technical Conditions of Contract (TCC)—Volume-1A
e. Special Conditions of Contract (SCC) —Volume-1B
f. General Conditions of Contract (GCC) —Volume-1C
g. Forms and Procedures —Volume-1D

It may please be noted that guidelines/ circulars/ amendments/ govt. directives issued from time to time shall also be applicable.

For BHARAT HEAVY ELECTRICALS LTD

(Addl. General Manager - Purchase)

Enclosure:

01. Annexure-1: Pre Qualifying Requirements.
02. Annexure-2: Check List.
~~03. Annexure-3: Certificate by Chartered Accountant~~
04. Annexure-4: Reverse Auction Process Compliance Form
05. Annexure-5: Authorization of representative who will participate in the online Reverse Auction Process
06. Annexure-6: RA Price Confirmation and Breakup
07. Annexure-7: Integrity Pact
08. Annexure-8: Undertaking as per PQR C4 of Annexure-1 i.e. PQR
09. Annexure-9: Declaration reg. Related Firms & their areas of Activities
010. Other Tender documents as per this NIT.
011. Annexure-10: DECLARATION REGARDING MINIMUM LOCAL CONTENT IN LINE WITH REVISED PUBLIC PROCUREMENT (PREFERENCE TO MAKE IN INDIA), ORDER 2017 DATED 04TH JUNE, 2020 AND SUBSEQUENT ORDER(S)
012. Annexure 11: DECLARATION REGARDING COMPLIANCE TO RESTRICTIONS UNDER RULE 144 (xi) OF GFR 2017
013. Annexure 12: Important information
014. Annexure-13:Bid Security Declaration Form

ANNEXURE - 1

PRE QUALIFYING CRITERIA

JOB	Electrical Package of Unit#1 and BOP of **3x800MW PVUNL Patratu Project**
TENDER NO	**BHE/PW/PUR/NTPRT-ELE/2474**

SL NO	PRE QUALIFICATION CRITERIA	~~Bidders claim in respect of fulfilling the PQR Criteria~~ Applicability	
A	Submission of Integrity Pact duly signed (if applicable) (Note: To be submitted by Prime Bidder & Consortium /Technical Tie up partner jointly in case Consortium bidding is permitted, otherwise by the sole bidder)	**APPLICABLE**	
B	**TECHNICAL PQR:** Bidder shall essentially meet all the Qualifying Requirements (i.e. B.1 & B.2) as under: B.1: Bidder should have Executed "Electrical Work/(s)" OR "Control & Instrumentation (C&I) Work/(s)" OR "Electrical and (Control & Instrumentation (C&I)) work/(s)" for any one of the following: B.1.1) Executed One work of value not less than Rs 260.00 Lakhs against single work order. OR B.1.2) Executed Two works each of value not less than Rs 162.50 Lakhs against maximum two work orders. OR B.1.3) Executed Three works each of value not less than Rs 130.00 Lakhs against maximum three work orders. AND B.2: B.2.1: Bidder should have Executed Electrical works consisting of following: a) Power Transformers (at least 189 MVA Rating of Transformer) b) HT Bus ducts c) HT Switchgears	**APPLICABLE**	
C.1	**FINANCIAL TURNOVER:** Bidders must have achieved an average annual financial turnover (audited) of **Rs 97.5 Lakhs** or more over last three Financial Years (FY) i.e. '2017-18, 2018-19 & 2019-20'.	**APPLICABLE**	
C.2	**NETWORTH** (only in case of Companies) Net worth of the Bidder based on the latest Audited Accounts as furnished for 'C-1' above should be positive.	**APPLICABLE**	

C.3	**PROFIT** Bidder must have earned profit in any one of the three Financial Years as applicable in the last three Financial Years as furnished for 'C-1' above.	**APPLICABLE**	
C-4	Bidder must not be under Bankruptcy Code Proceedings (IBC) by NCLT or under Liquidation / BIFR, which will render him ineligible for participation in this tender, and shall submit undertaking **(Annexure-8)** to this effect.	**APPLICABLE**	
D	Assessment of Capacity of Bidder: The "Assessment of Capacity of Bidders" for this Tender shall be carried out by considering the identified similar packages as **"Electrical"**.	**APPLICABLE**	
E	**Approval of Customer (if applicable)** **Note:** Names of bidders (including consortium/Technical Tie up partners in case consortium bidding is permitted) who stand qualified after compliance of criteria A to D shall be forwarded to customer for their approval	**NOT APPLICABLE**	
F	Price Bid Opening **Note:** Price Bids of only those bidders shall be opened who stand qualified after compliance of criteria A to E		**BY BHEL**
G	Consortium tie-ups	**NOT APPLICABLE**	

Explanatory Notes for the PQR (unless otherwise specified in the PQR):

Explanatory Notes for PQR B.1 (Technical)

- For the criteria (B.1), actual executed value shall be considered.
- Value of work is to be updated with indices for "All India Avg. Consumer Price index for industrial workers" and "Monthly Whole Sale Price Index for All Commodities" with base month as per last month of work execution and indexed up to three (3) months prior to the month of latest due date of bid submission as per following formula-

$$P = R + 0.425 \times R \times \frac{(X_N - X_0)}{X_0} + 0.425 \times R \times \frac{(Y_N - Y_0)}{Y_0}$$

Where
P = Updated value of work
R = Value of executed work
X_N = All India Avg. Consumer Price index for industrial workers for three months prior to the month of latest due date of bid submission (e.g. If latest bid submission date is 02-Mar-17, then bid submission month shall be reckoned as March'17 and index for Dec'2016 shall be considered).
X_0 = All India Avg. Consumer Price index for industrial workers for last month of work execution
Y_N = Monthly Whole Sale Price Index for All Commodities for three months prior to the month of latest due date of bid submission (e.g. If latest bid submission date is 02-Mar-17, then bid-submission month shall be reckoned as March'17 and index for Dec'2016 shall be considered).
Y_0 = Monthly Whole Sale Price Index for All Commodities for last month of work execution

- The evaluation currency for this tender shall be INR.

Explanatory Notes for Technical Criteria (B2):

1. VOID
2. Unless otherwise specified, for the purpose of "B2 Technical Criteria", the word 'EXECUTED' means achievement of milestones as defined below -
    a. "ACHIEVEMENT OF PHYSICAL QUANTITIES" as per PQRs.
    b. "READINESS FOR COAL FILLING" of at least one Bunker, in respect of Mill Bunker Structure.
    c. "CHARGING" in respect of Power Transformers/ Bus Ducts/ "HT/LT Switchgears" / "HT/LT Cabling".
    d. For C&I works: "SYNCHRONISATION" in case of power project (Excluding Nuclear Projects) / "WORK EXECUTION of the value as defined in PQR" in case of industry & Nuclear Projects.
    e. "BOILER LIGHT UP" in respect of Boiler / CFBC / ESP.
    f. "CHARGING OF ATLEAST ONE PASS" in respect of ESP(R&M)
    g. "GAS IN" in respect of HRSG.
    h. "STEAM BLOWING" in respect of Power Cycle Piping.
    i. "HYDRAULIC TEST"/ ANY OTHER EQUIVALENT TEST LIKE "100% RT/UT OF WELDED JOINTS" of the system in respect of Pressure parts/ LP Piping/CW Piping.
    j. "FULL LOAD OPERATION OF THE UNIT" in respect of Insulation work.
    k. "SYNCHRONISATION" in respect of STG / GTG.
    l. "SPINNING" in respect of HTG.
    m. "GAS IN" in respect of FGD
3. Boiler means HRSG or WHRB or any other types of Steam Generator.
4. Power Cycle piping means Main Steam, Hot Reheat, Cold Reheat, HP Bypass.
5. For the purpose of evaluation of the PQR, one MW shall be considered equivalent to 3.5 TPH where ever rating of HRSG/BOILER is mentioned in MW. Similarly, where ever rating of Gas Turbine is mentioned in terms of Frame size, ISO rating of the same in terms of MW shall be considered for evaluation.

Explanatory Notes for PQR -C (Financial):

C-1:

i. Bidder to submit Audited Balance Sheet and Profit and Loss Account for the respective years as indicated against C-1 above.
ii. Evaluation of Turnover criteria shall be calculated from the Audited Balance Sheet and Profit & Loss Account for the three Financial Years (FY).
iii. In case audited Financial statements have not been submitted for all the three years as indicated against C-1 above, then the applicable audited statements submitted by the bidders against the requisite three years, will be averaged for three years.
iv. If financial statements are not required to be audited statutorily, then instead of audited financial statements, financial statements are required to be certified by Chartered Accountant.

C-2: Net Worth (Only in case of companies) of the bidder should be positive.

Note: Net worth shall be calculated based on the latest Audited Accounts as furnished for 'C-1' above.

Net worth = Paid up share capital + Reserves

C-3: Bidder must have earned profit in any one of the three financial years as applicable in the last three financial years as furnished for 'C-1' above.

Note: PROFIT shall be PBT earned during any one year of last three financial years as in 'C-1' above.

C-4: Bidder must not be under Bankruptcy Code Proceedings (IBC) by NCLT or under Liquidation / BIFR, which will render him ineligible for participation in this tender, and shall submit undertaking to this effect.

Common Explanatory Notes:

1. For evaluation of PQR, in case Bidder alone does not meet the pre-qualifying technical criteria B1 above, bidder may utilize the experience of its Parent/ Subsidiary Company along with its own experience, subject to following:
   a. The parent company shall have a controlling stake of ≥50% in the subsidiary company (as per Format-1).
   b. The Parent Company/ Subsidiary Company of which experience is being utilized for bidding shall submit Security Deposit(SD) equivalent to 1% of the total contract value
   c. The parent/ subsidiary company and bidder shall provide an undertaking that they are jointly or severally responsible for successful performance of the contract (as per Format-2).
   d. In case Bidder is submitting bid as a Consortium Partner, option of utilizing experience of parent/subsidiary Company can be availed by Prime Bidder only.
   e. Parent Company/ Subsidiary Company of which experience is being used for bidding, cannot participate as a 'Standalone Bidder' or as a 'Consortium bidder'.
2. Completion date for achievement of the technical criteria specified in the 'B' above should be in the last 7 years ending on the 'latest date of Bid Submission' of Tender irrespective of date of the start of work. Completion date shall be reckoned from the " Financial Year quarter of bid submission". (for e.g. -Work completed on 01.01.2014 shall be considered even if latest date of bid submission is 20.03.2021).
3. "Executed" means the bidder should have achieved the technical criteria specified in the Common QR even if the Contract has not been completed or closed.
4. In case the Experience/PO/WO certificate enclosed by bidders do not have separate break up of prices for the E&C portion for Electrical and C&I works (i.e. the certificates enclosed are for composite order for supply and erection of Electrical and C&I and other works if any), then value of Erection & Commissioning for the Electrical and C&I portion shall be considered as 15% of the price for supply & erection of Electrical and C&I.
5. Following shall be complied with in case of consortium:
   a. The Prime Bidder and Consortium Partner(s) are required to enter in to a consortium agreement and certify to BHEL regarding existence and validity of their consortium agreement in line with validity period mentioned in NIT.
   b. Prime Bidder and Consortium partners shall be approved by Customer for being considered for the tender (applicable if customer approval is required).
   c. Number of partners including prime Bidder shall be NOT more than 3 (three).

	d. Prime Bidder alone shall necessarily comply with "B1Technical Criteria" except for mechanical package where B1 criteria is not applicable. e. Prime Bidder and Consortium Partner shall together comply with the 'Pre-Qualification Requirements' specified for the respective category of technical requirement as per "B2 technical criteria". f. Prime Bidder shall comply with all other Pre Qualifying criteria for the Tender unless otherwise specified. g. All other conditions shall be read in conjunction with clause no 23.0 of NIT. h. Prime Bidder shall be the Bidder who has a major share of work. i. Prime Bidder shall be responsible for the overall execution of the Contract. j. Performance shall be evaluated for Prime Bidder and the Consortium partner for their respective scope of work. k. In case the Consortium partner backs out, another consortium partner meeting the QRs, has to be engaged by Prime Bidder and if not, the respective work will be withdrawn and executed on risk and cost basis of the prime bidder. l. In case Prime Bidder withdraws or insolvency / liquidation / winding up proceedings have been initiated / admitted against the Prime Bidder, BHEL reserves the right to cancel, terminate or short close the contract or take any other action to safeguard BHEL's interest in the Project / Contract. This action will be without prejudice to any other action that BHEL can take under Law and the Contract to safeguard interests of BHEL m. After successful execution of one work with a consortium partner under direct orders of BHEL, the Prime Bidder shall be eligible for becoming a 'standalone' bidder for works similar to that for which consortium partner was engaged, for subsequent tenders. n. The Consortium partner shall submit SD equivalent to 1% of the total contract value in addition to the SD to be submitted by the Prime Bidder for the total contract value.

BIDDER SHALL SUBMIT ABOVE PRE-QUALIFICATION CRITERIA FORMAT, DULY FILLED-IN, SPECIFYING RESPECTIVE ANNEXURE NUMBER AGAINST EACH CRITERIA AND FURNISH RELEVANT DOCUMENT INCLUSIVE OF WORK ORDER AND WORK COMPLETION CERTIFICATE ETC IN THE RESPECTIVE ANNEXURES IN THEIR OFFER.

Credentials submitted by the bidder against "PRE QUALIFYING CRITERIAS" shall be verified for its authenticity. In case, any credential (s) is/are found unauthentic, offer of the bidder is liable to the rejection. BHEL reserves the right to initiate any further action as per extant guidelines for Suspension of Business Dealings.

Format-1

Format-1

Certificate for relationship between Parent Company / Subsidiary Company and the bidder

To,
.....

.....

Dear Sir,

Sub: Bid for NIT No .....dated..... for "....." (name of the tender).

We hereby certify that M/s..... is Parent Company/ Subsidiary Company of M/s.....(the bidder) and details of equity holding of the Parent Company in Subsidiary Company as on .....(not earlier than seven days prior to the Bid Submission Date) are given as below:

Name of Parent Company	Name of Subsidiary Company	Percentage of Equity Holding of Parent Company in Subsidiary Company

(Insert Name and Signature of Statutory Auditor or practicing Company Secretary of the Bidder)

Format-2

Format-2

Undertaking from the Parent Company/ Subsidiary Company of the bidder

(On the Letter Head of Parent Company/ Subsidiary Company, as applicable)

From,
Name:
Full Address:

Telephone No.:
E-mail address:
Fax/No.:

To,
.....
.....

Dear Sir,

We refer to the NIT No..... dated..... for "....." (name of the Tender).

"We have carefully read and examined in detail the NIT/Tender Terms and Conditions, including in particular, Clause .... of the NIT/Tender, regarding submission of an Undertaking, as per the prescribed Format 1 of the NIT/ Tender.

We confirm that M/s.....(the Bidder) has been authorized by us to use our Technical capability for meeting the Technical Criteria as specified in Clause.....of the PQR of the NIT/Tender referred above.

We agree to submit the Security Deposit equivalent to 1% of the total contract value in addition to Security Deposit to be submitted by Bidder as per Clause.....of the NIT/Tender for fulfillment of all obligations in terms of provisions of the contract, in the event of .....(the Bidder) being selected as the Successful Bidder.

We confirm that we along with M/s.....(the bidder), are jointly or severally responsible for successful performance of the contract.
We confirm that our company shall not participate in the above tender as a 'Standalone Bidder' or as a 'Consortium bidder' and also shall not authorize any other bidder to use our Technical capability for the above tender.

All the terms used herein but not defined, shall have the meaning as ascribed to the said terms under the referred NIT/Tender.

Signature of Managing Director/Authorized signatory of Parent/ Subsidiary Company

ANNEXURE - 2

CHECK LIST

NOTE: - Tenderers are required to fill in the following details and no column should be left blank

1	Name and Address of the Tenderer		
2	Details about type of the Firm/Company		
3.a	Details of Contact person for this Tender	Name : Mr/Ms Designation: Telephone No: Mobile No: Email ID: Fax No:	
3.b	Details of alternate Contact person for this Tender	Name : Mr/Ms Designation: Telephone No: Mobile No: Email ID: Fax No:	
4	EMD DETAILS	DD No: Date : Bank : Amount: Please tick (√) whichever applicable:- ~~ONE TIME EMD /~~ ONLY FOR THIS TENDER	
5	Validity of Offer	TO BE VALID FOR SIX MONTHS FROM DUE DATE	
		APPLICABILITY (BY BHEL)	ENCLOSED BY BIDDER
6	Whether the format for compliance with **PRE QUALIFICATION CRITERIA** (ANNEXURE-I) is understood and filled with proper supporting documents referenced in the specified format	Applicable	YES / NO
7	Audited profit and Loss Account for the last three years	Applicable/~~Not Applicable~~	YES/NO
8	Copy of GST & PAN Card	Applicable/~~Not Applicable~~	YES/NO
9	Whether all pages of the Tender documents including annexures, appendices etc. are read understood and signed	Applicable/~~Not Applicable~~	YES/NO
10	Integrity Pact	Applicable/~~Not Applicable~~	YES/NO
11	OFFER FORWARDING LETTER / TENDER SUBMISSION LETTER	Applicable/~~Not Applicable~~	YES/NO
12	Declaration by Authorized Signatory	Applicable/~~Not Applicable~~	YES/NO
13	No Deviation Certificate	Applicable/~~Not Applicable~~	YES/NO
14	Declaration confirming knowledge about Site Conditions	Applicable/~~Not Applicable~~	YES/NO
15	Declaration for relation in BHEL	Applicable/~~Not Applicable~~	YES/NO
16	Non-Disclosure Certificate	Applicable/~~Not Applicable~~	YES/NO

17	Bank Account Details for E-Payment	Applicable/~~Not Applicable~~	YES/NO
18	Capacity Evaluation of Bidder for current Tender	Applicable/~~Not Applicable~~	YES/NO
19	Tie Ups/Consortium Agreement are submitted as per format	~~Applicable~~/Not Applicable	YES/ NO
20	Power of Attorney for Submission of Tender/Signing Contract Agreement ~~Power of Attorney of Consortium Partner~~.	Applicable/~~Not Applicable~~	YES/NO
21	Analysis of Unit rates	Applicable/~~Not Applicable~~	YES/NO
22	Annexure-5: Authorization of representative who will participate in the online Reverse Auction Process	Applicable/~~Not Applicable~~	YES/NO
23	Annexure-6: RA Price Confirmation and Breakup	Applicable/~~Not Applicable~~	YES/NO
24	Annexure-8: Undertaking as per PQR C4 of Annexure-1 i.e. PQR	Applicable/~~Not Applicable~~	YES/NO
25	Annexure-9: Declaration reg. Related Firms & their areas of Activities (x) Other Tender documents as per this NIT.	Applicable/~~Not Applicable~~	YES/NO
26	Annexure-10 Declaration regarding minimum local content	Applicable/~~Not Applicable~~	YES/NO
27	Annexure-11: Declaration regarding compliance to restrictions under rule 144 (xi) of GFR 2017	Applicable/~~Not Applicable~~	YES/NO
28	Annexure-13:Bid Security Declaration Form	Applicable/~~Not Applicable~~	YES/NO

NOTE: STRIKE OFF 'YES' OR 'NO', AS APPLICABLE. TENDER NOT ACCOMPANIED BY THE PRESCRIBED **ABOVE APPLICABLE DOCUMENTS** ARE LIABLE TO BE SUMMARILY REJECTED.

DATE :

AUTHORISED SIGNATORY

(With Name, Designation and Company seal)

ANNEXURE-3

Certificate by Chartered Accountant on letter head

(applicable upto 31st March'2021 in line with MSME notification no. S.O. 2119 (E), dated 26th June'2020)

This is to Certify that M/S ....., (hereinafter referred to as 'company') having its registered office at ..... is registered under MSMED Act 2006, (Entrepreneur Memorandum No (Part – II)/ Udyam Registration Certificate No. ..... dtd: ....., Category: ..... (Micro/Small/Medium). (Copy enclosed).

Further verified from the Books of Accounts that the investment of the company as per the latest audited financial year..... as per MSMED Act 2006 is as follows:

1. **For Manufacturing Enterprises:** Investment in plant and machinery (i.e. original cost excluding land and building and the items specified by the Ministry of Small Scale Industries vide its notification No. S.O.1722(E) dated October 5, 2006:
   Rs .....Lacs

2. **For Service Enterprises:** Investment in equipment (original cost excluding land and building and furniture, fittings and other items not directly related to the service rendered or as may be notified under the **MSMED** Act, 2006:
   Rs .....Lacs

3. **For Enterprises** (having EM-II Certificate/ valid NSIC Certificate or Udyog Aadhar Memorandum): Investment in plant and machinery or equipment is Rs..... Lacs and turnover is Rs. ..... Lacs (as notified in MSME notification no. S.O. 2119 (E) dated 26.06.2020)

4. **For Enterprises** (having EM-II Certificate/ valid NSIC Certificate or Udyog Aadhar Memorandum): Investment in plant and machinery or equipment is Rs..... Lacs and turnover is Rs. ..... Lacs (as notified in MSME notification no. S.O. 2119 (E) dated 26.06.2020)

(Strike off whichever is not applicable)

The above investment of Rs ..... Lacs is within permissible limit of Rs.....Lacs for .....Micro / Small/ Medium *(Strike off which is not applicable)* Category under MSMED Act 2006.

Or

The enterprise has been graduated upward from its original category (micro/small/medium) (*strike off which is not applicable*), the enterprise shall maintain its prevailing status till expiry of one year from the close of year of registration, as notified vide S.O. No. 2119 (E) dated 26.06.2020 published in the gazette notification dated 26.06.2020 by Ministry of MSME.

Or

The enterprise has been reverse-graduated from its original category (micro/small/medium) (*strike off which is not applicable*), the enterprise will continue in its present category till the closure of the financial year and it will be given the benefit of the changed status only with effect from 1st April of the financial year following the year in which such change took place, as notified vide S.O. No. 2119 (E) dated 26.06.2020 published in the gazette notification dated 26.06.2020 by Ministry of MSME.

Date:
(Signature)
Name:
Membership Number:
Seal of the Chartered Accountant

ANNEXURE-4

Reverse Auction Process Compliance Form

(The bidders are required to print this on their company's letterhead and sign, stamp before RA)

To

- M/s. {*Service provider*
- *Postal address}*

Sub: Agreement to the Process related Terms and Conditions

Dear Sir,

This has reference to the Terms & Conditions for the Reverse Auction mentioned in the RFQ document for {Items} against BHEL enquiry/ RFQ no.{ BHE/PW/PUR/NTPRT-ELE/2474} dt. {…….}
This letter is to confirm that:

1) The undersigned is authorized official/ representative of the company to participate in RA and to sign the related documents.
2) We have studied the Reverse Auction guidelines (as available on www.bhel.com), and the Business rules governing the Reverse Auction as mentioned in your letter and confirm our agreement to them.
3) We also confirm that we have taken the training on the auction tool and have understood the functionality of the same thoroughly.
4) We also confirm that, in case we become L1 bidder, we will FAX/ email the price confirmation & break up of our quoted price as per *Annexure - 6* within **two** working days (of BHEL) after completion of RA event, besides sending the same by registered post/ courier both to M/s. BHEL and M/s. {*Service provider.}*

We, hereby confirm that we will honor the Bids placed by us during the auction process.

With regards

Signature with company seal
Name:
Company / Organization:
Designation within Company / Organization:
Address of Company / Organization:

Sign this document and FAX/ email it to M/s *{Service provider}* at *{……..}* prior to start of the Event.

ANNEXURE – 5

Authorization of representative who will participate in the on line Reverse Auction Process:

1	NAME OF THE BIDDER	
2	NAME & DESIGNATION OF OFFICIAL	
3	POSTAL ADDRESS (COMPLETE)	
4	TELEPHONE NOS. (LAND LINE & MOBILE BOTH)	
5	E-MAIL ADDRESS	
6	NAME OF PLACE/ STATE/ COUNTRY, WHEREFROM S/HE WILL PARTICIPATE IN THE REVERSE AUCTION	

ANNEXURE – 6

Reverse Auction price confirmation and breakup
(To be submitted by L1 bidder after completion of Reverse Auction)

To
- M/s. *Service provider*
- *Postal address*

CC: M/s BHEL *POWER SECTOR WESTERN REGION, Nagpur*

Sub: **Final price quoted during Reverse Auction ~~and price breakup~~**

Dear Sir,

We confirm that we have quoted.

Rs. _____(in value) &

_____(in words)

for item(s) covered under tender enquiry No. BHE/PW/PUR/NTPRT-ELE/2474

~~Total price of the items covered under above cited enquiries is inclusive of {*Packing & forwarding, GST, E.D., C.S.T., freight and insurance charges up to {……} District,{……} State and Type Test Charges etc., (exclusive of service tax), other as per NIT*}~~

as our final landed prices as quoted during the Reverse Auction conducted today {*date* _____} which will be valid for a period ~~of {___ **in nos. & in words** ___} days~~. as mentioned in the subject tender.

Yours sincerely,
For _____
Name:
Company:
Date:
Seal:

ANNEXURE – 7

INTEGRITY PACT

Between

Bharat Heavy Electricals Ltd. (BHEL), a company registered under the Companies Act 1956 and having its registered office at "BHEL House", Siri Fort, New Delhi - 110049 (India) hereinafter referred to as "The Principal", which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the ONE PART

and

_____, (description of the party along with address), hereinafter referred to as "The Bidder/ Contractor" which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the OTHER PART

Preamble

The Principal intends to award, under laid-down organizational procedures, contract/s for _____
_____
_____ . The Principal values full compliance with all relevant laws of the land, rules and regulations, and the principles of economic use of resources, and of fairness and transparency in its relations with its Bidder(s)/ Contractor(s).

In order to achieve these goals, the Principal will appoint Independent External Monitor(s), who will monitor the tender process and the execution of the contract for compliance with the principles mentioned above.

Section 1- Commitments of the Principal

1.1 The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles:-

1.1.1 No employee of the Principal, personally or through family members, will in connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.

1.1.2 The Principal will, during the tender process treat all Bidder(s) with equity and reason. The Principal will in particular, before and during the tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential/ additional information through which the Bidder(s) could obtain an advantage in relation to the tender process or the contract execution.

1.1.3 The Principal will exclude from the process all known prejudiced persons.

1.2 If the Principal obtains information on the conduct of any of its employees which is a penal offence under the Indian Penal Code 1860 and Prevention of Corruption Act 1988 or any other statutory penal enactment, or if there be a substantive suspicion in this regard, the Principal will inform its Vigilance Office and in addition can initiate disciplinary actions.

Section 2 - Commitments of the Bidder(s)/ Contractor(s)

2.1 The Bidder(s)/ Contractor(s) commit himself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the tender process and during the contract execution.

2.1.1 The Bidder(s)/ Contractor(s) will not, directly or through any other person or firm, offer, promise or give to the Principal or to any of the Principal's employees involved in the tender process or the execution of the contract or to any third person any material, immaterial or any other benefit which he/ she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.

2.1.2 The Bidder(s)/ Contractor(s) will not enter with other Bidder(s) into any illegal or undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.

2.1.3 The Bidder(s)/ Contractor(s) will not commit any penal offence under the relevant Indian Penal Code (IPC) and Prevention of Corruption Act; further the Bidder(s)/ Contractor(s) will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.

2.1.4 Foreign Bidder(s)/ Contractor(s) shall disclose the name and address of agents and representatives in India and Indian Bidder(s)/ Contractor(s) to disclose their foreign principals or associates. The Bidder(s)/ Contractor(s) will, when presenting his bid, disclose any and all payments he has made, and is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract.

2.2 The Bidder(s)/ Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.

2.3 The Bidder(s)/ Contractor(s) shall not approach the Courts while representing the matters to IEMs and will await their decision in the matter.

Section 3 - Disqualification from tender process and exclusion from future contracts

If the Bidder(s)/ Contractor(s), before award or during execution has committed a transgression through a violation of Section 2 above, or acts in any other manner such as to put his reliability or credibility in question, the Principal is entitled to disqualify the Bidder(s)/ Contractor(s) from the tender process or take action as per the separate "Guidelines on Banning of Business dealings with Suppliers/ Contractors", framed by the Principal.

Section 4 - Compensation for Damages

4.1 If the Principal has disqualified the Bidder from the tender process prior to the award according to Section 3, the Principal is entitled to demand and recover the damages equivalent Earnest Money Deposit/ Bid Security.

4.2 If the Principal has terminated the contract according to Section 3, or if the Principal is entitled to terminate the contract according to section 3, the Principal shall be entitled to demand and recover from the Contractor liquidated damages equivalent to 5% of the contract value or the amount equivalent to Security Deposit/ Performance Bank Guarantee, whichever is higher.

Section 5 - Previous Transgression

5.1 The Bidder declares that no previous transgressions occurred in the last 3 years with any other company in any country conforming to the anti-corruption approach or with any other Public Sector Enterprise in India that could justify his exclusion from the tender process.

5.2 If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

Section 6 - Equal treatment of all Bidders/ Contractors / Sub-contractors

6.1 The Principal will enter into agreements with identical conditions as this one with all Bidders and Contractors. In case of sub-contracting, the Principal contractor shall be responsible for the adoption of IP by his sub-contractors and shall continue to remain responsible for any default by his sub-contractors.

6.2 The Principal will disqualify from the tender process all bidders who do not sign this pact or violate its provisions.

Section 7 - Criminal Charges against violating Bidders/ Contractors /Subcontractors

If the Principal obtains knowledge of conduct of a Bidder, Contractor or Subcontractor, or of an employee or a representative or an associate of a Bidder, Contractor or Subcontractor which constitutes corruption, or if the Principal has substantive suspicion in this regard, the Principal will inform the Vigilance Office.

Section 8 -Independent External Monitor(s)

8.1 The Principal appoints competent and credible Independent External Monitor for this Pact. The task of the Monitor is to review independently and objectively, whether and to what extent the parties comply with the obligations under this agreement.

8.2 The Monitor is not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the CMD, BHEL.

8.3 The Bidder(s)/ Contractor(s) accepts that the Monitor has the right to access without restriction to all contract documentation of the Principal including that provided by the Bidder(s)/ Contractor(s). The Bidder(s)/ Contractor(s) will grant the monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his contract documentation. The same is applicable to Sub-contractor(s). The Monitor is under contractual obligation to treat the information and documents of the Bidder(s)/ Contractor(s) / Sub-contractor(s) with confidentiality in line with Non- disclosure agreement.

8.4 The Principal will provide to the Monitor sufficient information about all meetings among the parties related to the contract provided such meetings could have an impact on the contractual relations between the Principal and the Contractor. The parties offer to the Monitor the option to participate in such meetings.

8.5 The role of IEMs is advisory, would not be legally binding and it is restricted to resolving issues raised by an intending bidder regarding any aspect of the tender which allegedly restricts competition or bias towards some bidders. At the same time, it must be understood that IEMs are not consultants to the Management. Their role is independent in nature and the advice once tendered would not be subject to review at the request of the organization.

8.6 For ensuring the desired transparency and objectivity in dealing with the complaints arising out of any tendering process, the matter should be examined by the full panel of IEMs jointly as far as possible, who would look into the records, conduct an investigation, and submit their joint recommendations to the Management.

8.7 The IEMs would examine all complaints received by them and give their recommendations/ views to CMD, BHEL, at the earliest. They may also send their report directly to the CVO and the Commission, in case of suspicion of serious irregularities requiring legal/ administrative action. IEMs will tender their advice on the complaints within 10 days as far as possible.

8.8 The CMD, BHEL shall decide the compensation to be paid to the Monitor and its terms and conditions.

8.9 IEM should examine the process integrity; they are not expected to concern themselves with fixing of responsibility of officers. Complaints alleging mala fide on the part of any officer of the organization should be looked into by the CVO of the concerned organisation.

8.10 If the Monitor has reported to the CMD, BHEL, a substantiated suspicion of an offence under relevant Indian Penal Code/ Prevention of Corruption Act, and the CMD, BHEL has not, within reasonable time, taken visible action to proceed against such offence or reported it to the Vigilance Office, the Monitor may also transmit this information directly to the Central Vigilance Commissioner, Government of India.

8.11 The number of Independent External Monitor(s) shall be decided by the CMD, BHEL.

8.12 The word `Monitor' would include both singular and plural.

Section 9 - Pact Duration

9.1 This Pact shall be operative from the date IP is signed by both the parties till the final completion of contract for successful bidder and for all other bidders 6 months after the contract has been awarded. Issues like warranty / guarantee etc. should be outside the purview of IEMs.

9.2 If any claim is made/ lodged during currency of IP, the same shall be binding and continue to be valid despite the lapse of this pact as specified above, unless it is discharged/ determined by the CMD, BHEL.

Section 10 - Other Provisions

10.1 This agreement is subject to Indian Laws and jurisdiction shall be registered office of the Principal, i.e. New Delhi.

10.2 Changes and supplements as well as termination notices need to be made in writing. Side agreements have not been made.

10.3 If the Contractor is a partnership or a consortium, this agreement must be signed by all partners or consortium members.

10.4 Should one or several provisions of this agreement turn out to be invalid, the remainder of this agreement remains valid. In this case, the parties will strive to come to an agreement to their original intentions.

10.5 Only those bidders / contractors who have entered into this agreement with the Principal would be competent to participate in the bidding. In other words, entering into this agreement would be a preliminary qualification.

TAPISH KUMAR

Digitally signed by TAPISH KUMAR
DN: c=IN, o=Bharat Heavy Electricals Limited, ou=Power Sector Western Region, postalCode=440001, st=Maharashtra, 2.5.4.20=8c9c4ba81b382ef83056ea79309d323571ff53595cde216aaa3a12a959fd86364, cn=TAPISH KUMAR
Date: 2021.09.09 10:12:42 +05'30'

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

For & On behalf of the Principal For & On behalf of the Bidder/ Contractor

(Office Seal) (Office Seal)

Place----------

Date----------

Witness: _____ Witness: _____

(Name & Address) _____ (Name & Address) _____

_____ _____

ANNEXURE – 8

UNDERTAKING

(To be typed and submitted in the Letter Head of the Company/Firm of Bidder)

To,

(Write Name & Address of Officer of BHEL inviting the Tender)

Dear Sir/Madam,

Sub: DECLARATION REGARDING INSOLVENCY/ LIQUIDATION/ BANKRUPTCY PROCEEDINGS

Ref: NIT/Tender Specification No: BHE/PW/PUR/NTPRT-ELE/2474

I/We, _____ declare that, I/We am/are not under insolvency resolution process or liquidation or Bankruptcy Code Proceedings (IBC) as on date, by NCLT or any adjudicating authority/authorities, which will render us ineligible for participation in this tender.

Sign. of the AUTHORISED SIGNATORY
(With Name, Designation and Company seal)

Place:
Date:

Annexure-9

DECLARATION

Date:_____

To _____

BHEL, _____
_____
_____

Email: _____

Sub: **Details of related firms and their area of activities**

Dear Sir/ Madam,

Please find below details of firms owned by our family members that are doing business/ registered for same item with BHEL,_____ (NA, if not applicable).

1	Material Category/ Work Description	
	Name of Firm	
	Address of Firm	
	Nature of Business	
	Name of Family Member	
	Relationship	
2	Material Category/ Work Description	
	Name of Firm	
	Address of Firm	
	Nature of Business	
	Name of Family Member	
	Relationship	
……		

Note: I certify that the above information is true and I agree for penal action from BHEL in case any of the above information furnished is found to be false.

Regards,
(_____)

From: M/s _____
Supplier Code: _____
Address: _____
_____
_____

Annexure-10

DECLARATION REGARDING MINIMUM LOCAL CONTENT IN LINE WITH REVISED PUBLIC PROCUREMENT (PREFERENCE TO MAKE IN INDIA), ORDER 2017 DATED 04TH JUNE, 2020 AND SUBSEQUENT ORDER(S)

(To be typed and submitted in the Letter Head of the Entity/Firm providing certificate as applicable)

To,

(Write Name & Address of Officer of BHEL inviting the Tender)

Dear Sir,

Sub: Declaration reg. minimum local content in line with Public Procurement (Preference to Make in India), Order 2017-Revision, dated 04th June, 2020 and subsequent order(s).

Ref : 1) NIT/Tender Specification No: ……..,
2) All other pertinent issues till date

We hereby certify that the items/works/services offered by…… *(specify the name of the organization here)* has a local content of _____ % and this meets the local content requirement for **'Class-I local supplier' / 'Class II local supplier' **** as defined in Public Procurement (Preference to Make in India), Order 2017-Revision dated 04.06.2020 issued by DPIIT and subsequent order(s).

The details of the location(s) at which the local value addition is made are as follows:

1. _____ 2. _____
3. _____ 4. _____

…
…
…

Thanking you,
Yours faithfully,

(Signature, Date & Seal of Authorized Signatory of the Bidder)

****** - *Strike out whichever is not applicable.*

Note:

1. Bidders to note that above format Duly filled & signed by authorized signatory, shall be submitted along with the techno-commercial offer.
2. In case the bidder's quoted value is in excess of Rs. 10 crores, the authorized signatory for this declaration shall necessarily be the statutory auditor or cost auditor of the company (in the case of companies) or a practising cost accountant or practicing chartered accountant (in respect of suppliers other than companies).
3. In the event of false declaration, actions as per the above order and as per BHEL Guidelines shall be initiated against the bidder.)

Annexure-11

DECLARATION REGARDING COMPLIANCE TO RESTRICTIONS UNDER RULE 144 (xi) OF GFR 2017

(To be typed and submitted in the Letter Head of the Entity/Firm providing certificate as applicable)

To,

(*Write Name & Address of Officer of BHEL inviting the Tender*)

Dear Sir,

Sub: Declaration regarding compliance to Restrictions under Rule 144 (xi) of GFR 2017

Ref : 1) NIT/Tender Specification No: BHE/PW/PUR/NTPRT-ELE/2474
2) All other pertinent issues till date

I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India and on sub-contracting to contractors from such countries. I certify that _____ *(specify the name of the organization here)*,

(a) is not from such a country / ☐
(b) has been registered with the Competent Authority *(attach valid registration by the Competent Authority, i.e., the Registration Committee constituted by the Dept. for Promotion of Industry and Internal Trade (DPIIT))*; ☐

and will not sub-contract any work to a contractor from such countries unless such contractor is registered with the Competent Authority. *(attach relevant valid registration, if applicable)*

I hereby certify that we fulfil all requirements in this regard and is eligible to be considered.

Thanking you,
Yours faithfully,

(Signature, Date & Seal of Authorized Signatory of the Bidder)

Note: Bidders to note that in case above certification given by a bidder, whose bid is accepted, is found to be false, then this would be a ground for immediate termination and for taking further action in accordance with law and as per BHEL guidelines.

Annexure-12: IMPORTANT INFORMATION

E -Tender for this work is invited by BHEL PSWR NAGPUR and offer shall be submitted through BHEL e-procurement portal only. All correspondences regarding this tender shall be through E-procurement portal.

Postal Address:
GM /Purchase BHEL PSWR,
SRIMOHINI COMPLEX, Floor No. 5 & 6, 345 KINGSWAY, NAGPUR 440001, INDIA

Following are the concerned BHEL officials to whom bidders can contact in case of any difficulty:

AGM Purchase, Email: prchiwarkar@bhel.in. Ph: +91 – 712 – 2858 – 633
Dy Manager Purchase, Email: tapishkhandelwal@bhel.in Ph: +91-712 – 2858 –732
Dy Manager Purchase, Email: svm@bhel.in Ph: +91-712 – 2858 –715
Sr. Manager Purchase, Email: kamleshbhel@bhel.in Ph: +91-712-2858-645

1. **Refer Chapter XII of Volume IB Special Conditions of Contract regarding Suspension of Business Dealings: The abridged version of extant 'Guidelines for suspension of business dealings with suppliers/ contractors' has now been uploaded on www.bhel.com on "supplier registration page" at the following link:** https://www.bhel.com/sites/default/files/suspension_guidelines_abridged.pdf

2. **All Statutory Requirements as applicable for this project shall be complied with.**

3. **Following clause shall form part of the HSE documents issued under Chapter IX of Volume IB 'Special Conditions of Contract'**

   "In case of any financial deduction made by Customer for lapses of safety other than what is provided elsewhere in the contract, the same shall be charged on back-to-back basis on the defaulting contractor without prejudice to any other right spelt anywhere in the tender /contract"

4. **"Pradhan Mantri Kaushal Vikas Yojna:** The contractor shall, at all stages of work deploy skilled/semi-skilled tradesmen who are qualified and possess certificate in particular trade from CPWD Training Institute/Industrial Training Institute/ National Institute of Construction Management and Research (NICMAR), National Academy of Construction, CIDC or any similar reputed and recognized Institute managed/ certified by State/ Central Government. The number of such qualified tradesmen shall not be less than 20% of total skilled/semi-skilled workers required in each trade at any stage of work. The contractor shall submit number of man days required in respect of each trade, its scheduling and the list of qualified tradesmen along with requisite certificate from recognized Institute to Engineer-in-Charge for approval. Notwithstanding such approval, if the tradesmen are found to have inadequate skill to execute the work of respective trade, the contractor shall substitute such tradesmen within two days of written notice from Engineer-in-Charge. Failure on the part of contractor to obtain approval of Engineer-in–Charge or failure to deploy qualified tradesmen will attract a compensation to be paid by contractor at the rate of Rs.100 per such tradesman per day. Decision of Engineer-in-Charge as to whether particular tradesman possesses requisite skill and amount of compensation in case of default shall be final and binding".

5. **The clause 2.7.9.1 below is added under the heading "Rights of BHEL" of General Conditions of Contract Volume-IC GCC.**

2.7.9.1 Provision of Penalty in case of slippage of Intermediate Milestones:

i) Two major Intermediate Milestones are mentioned as M1 & M2 in Chapter VI: Time Schedule of Vol IA Technical Conditions of Contract.
ii) In case of slippage of these identified Intermediate Milestones, Delay Analysis shall be carried out on achievement of each of these two Intermediate Milestones in reference to Form 14.
iii) In case delay in achieving M1 Milestone is solely attributable to the contractor, 0.5% per week of Executable Contract Value*, limited to maximum 2% of Executable Contract Value, will be withheld.
iv) In case delay in achieving M2 Milestone is solely attributable to the contractor, 0.5% per week of Executable Contract Value*, limited to maximum 3% of Executable Contract Value, will be withheld.
v) Amount already withheld, if any against slippage of M1 milestone, shall be released only if there is no delay attributable to contractor in achievement of M2 Milestone.
vi) Amount required to be withheld on account of slippage of identified intermediate milestone(s) shall be withheld out of respective milestone payment and balance amount (if any) shall be withheld @10% of RA Bill amount from subsequent RA bills.
vii) Final deduction towards LD (if applicable as per clause 2.7.9 above), on account of delay attributable to contractor shall be based on final delay analysis on completion / closure of contract. Withheld amount, if any due to slippage of identified intermediate milestone(s) shall be adjusted against LD or released as the case may be.
viii) In case of termination of contract due to any reason attributable to contractor before completion of work, the amount already withheld against slippage of intermediate milestones shall not be released and be converted into recovery.

* **Executable Contract Value** - Value of work for which inputs/ fronts were made available to contractor and were scheduled for execution till the date of achievement of that milestone.

6. **The following clause is added under clause 1.10 Security Deposit in Vol-1C:**

Clause No 1.10.8 of Vol-IC General Conditions of Contract: Timely Submission of Security Deposit for Execution of the contract: "Bidder agrees to submit Security Deposit required for execution of the contract within the time period mentioned. In case of delay in submission of Security Deposit, enhanced Security Deposit which would include interest (Base rate of SBI +6%) for the delayed period, shall be submitted by the bidder. Further, if Security Deposit is not submitted till such time the first bill becomes due, the amount of Security Deposit due shall be recovered as per terms defined in NIT/contract, from the bills along with due interest."

7. Acceptance of Bank Guarantee (BG)

Revision in Acceptance of Bank Guarantee (BG) Clause no. 1.10.3 (iii) of Vol I C GCC:

Clause No. 1.10.3 (iii) of Vol IC GCC is revised as below: -

"Bank Guarantee issued by:

a. Any of the BHEL consortium bank listed below:

State Bank of India
ABN Amro Bank N.V.
Bank of Baroda
Canara Bank

Citi Bank N.A.
Corporation Bank
Deutsche Bank
HDFC Bank Ltd.
The Hongkond and Shanghai Banking Corporation Ltd
ICICI Bank Ltd.
IDBI Ltd.
Punjab National Bank
Standard Chartered Bank
State Bank of Travancore
State Bank of Hyderabad
Syndicate Bank

b. Any public sector Bank (other than consortium banks) with a clause in the text of Bank Guarantee that "**It is enforceable at Nagpur, Maharashtra**".

c. Any private sector banks, with a clause in the text of Bank Guarantee that "**It is enforceable by being presented at any branch of the bank**".

Note: "Bank Guarantees issued by Co-operative Banks are not acceptable".

8. Broad Terms & Conditions of Reverse Auction:

In continuation to Clause 19.0 of NIT (Notice Inviting Tender) following are the broad terms and conditions of Reverse Auction:

"BHEL shall be resorting to Reverse Auction (RA) (Guidelines as available on www.bhel.com**) (https://www.bhel.com/guidelines-reverse-auction-2021)** for this tender. RA shall be conducted among the techno-commercially qualified bidders.

Price bids of all techno-commercially qualified bidders shall be opened and same shall be considered for RA. In case any bidder(s) do(es) not participate in online Reverse Auction, their sealed envelope price bid along with applicable loading, if any, shall be considered for ranking."

Note:-

1. No benefits to MSE bidders w.r.t Reverse Auction Guidelines as available on www.bhel.com against works contract.

2. In case of enquiry through e-procurement the sealed electronic price bid (e-bid) is to be treated as sealed envelope price bid.

~~9. Bidders kindly to take note that EMD (Earnest Money Deposit) shall be furnished by MSE bidders as well, as per the amount and procedure indicated in the NIT/GCC~~

10. **Clause no. 2.24 of GCC PERFORMANCE GUARANTEE FOR WORKMANSHIP:** The guarantee period of twelve months shall commence from the date of Completion of contract as certified by BHEL Engineer.

11. **Clause no. 2.17.5 (Price Variation Compensation) of GCC: 2.17.5 of GCC to be read as:** Base date shall be calendar month of the bid submission date + bid validity period + scheduled contractual completion period as per letter of intent/ award and/or work order.

Bid Security Declaration Form(Annexure-13)

(To be typed and submitted in the Letter Head of the Company/Firm of Bidder)

To,

(Write Name & Address of Officer of BHEL inviting the Tender)

Dear Sir/Madam,

Sub: Bid Security Declaration

Ref: NIT/Tender Specification No: **BHE/PW/PUR/NTPRT-ELE/2474**

SCOPE OF WORK: Electrical Package of Unit#1 and BOP of **3x800MW PVUNL Patratu Project**.

1. I/We Mr/ Ms…… authorised person to sign the bid documents for tender pertaining to the captioned scope do hereby declare that I/We have gone through the entire tender documents including terms and condition mentioned in the tender documents and undertake to comply with them.

2. I/We further declare that we will not withdraw our bid or modify our offer during the period of validity of the bid after the deadline for submission of such documents.

3. If I/we withdraw or modify the bids during the period of validity, or if I/We are awarded the contract and fail to sign the contract, if applicable or to submit security deposit as defined in the tender document/LOA, we will be suspended for the period of time as specified in the tender document from being eligible to submit bids/proposals to BHEL.

Signature of the Authorised Signatory
(With Name, Designation and Company seal)

Place:

Date:

2474

TECHNICAL CONDITIONS OF CONTRACT (TCC)

BHARAT HEAVY ELECTRICALS LIMITED

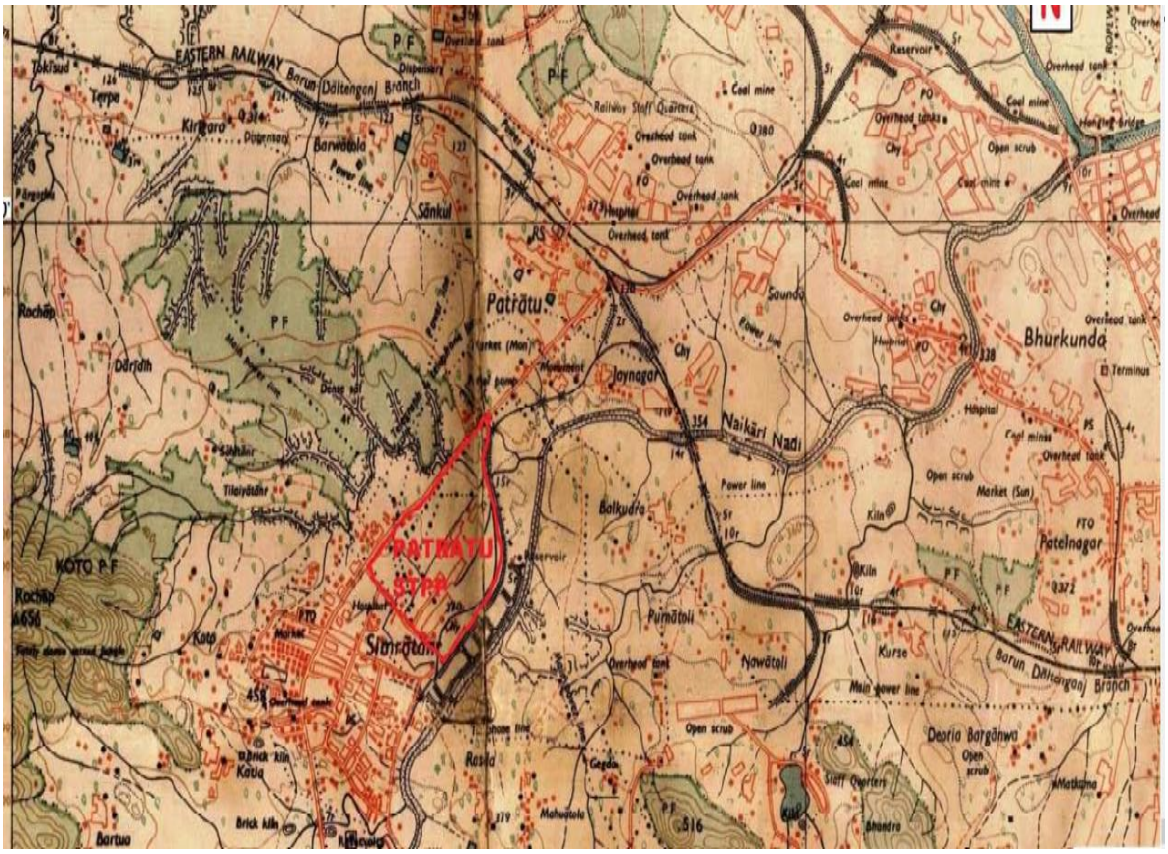
S. No.	DESCRIPTION	Chapter
Volume-IA	**Part-I: Contract specific details**	
1	Project Information	Chapter-I
2	Scope of Works	Chapter-II
3	Facilities in the scope of Contractor/ BHEL (Scope Matrix)	Chapter-III
4	T&Ps and MMEs to be deployed by Contractor	Chapter-IV
5	T&Ps and MMEs to be deployed by BHEL on sharing basis	Chapter-V
6	Time Schedule	Chapter-VI
7	Terms of Payment	Chapter-VII
8	Taxes and Duties	Chapter-VIII
9	Specific Inclusion	Chapter-IX
10	Specific Exclusion	Chapter-X
11	Technical details & BOQ	Chapter-XI
12	Schedule of items Quantities and Factor for deriving Item Rate from the accepted Lump-sum Price	Chapter-XII

1. PROJECT INFORMATION

Project Information details are as follows:

1	Project Name	3x800 MW Patratu Vidut Utpadan Nigam Ltd. (PVUNL) Patratu STPP	
2	Plant Site Location	Near Patratu town in Ramgarh district of Jharkhand	
3	Location Co-ordinate	Main Plant & Township:	
3.1	Corner name	Latitude	Longitude
3.2	Top Corner	23°39'00'' N	85°17'51.5"E
3.3	Bottom Corner	23°38'12.5''N	85°17'27"E
3.4	Left Corner	23°38'22.5''N	85° 17'10.6''E
3.5	Right Corner	23°38'40''N	85°17'57''E
4	Nearest Town/ City	Patratu -03km, Ramgarh–30km, Ranchi – 37km	
5	Nearest Railway Station	Patratu-4km	
6	Nearest Airport	Ranchi–45km	
7	Nearest Seaport	Kolkata–424km	
8	Nearest Road Access	Ranchi Patratu Ramgarh Road	
9	Site Elevation	377m above MSL	
10	Ambient Temperature		
10.1	Mean of Daily Maximum Temperature	40°C (During May)	
10.2	Mean of Daily Minimum Temperature	10.7°C (During December)	
10.3	Wet Bulb Temperature	27°C (Maximum)	
11	Annual Rainfall	311mm average annually	
12	Wind Speed	0 to 39 km/ hr	
13	Wind Direction	East North East to West South West	
14	Seismic Zone	Zone III as per IS:1893	

The vicinity map of the project is shown below



The Bidder shall visit site and get acquainted himself with the conditions prevailing at site before submission of the bid. The information given here in under are for general guidance and shall not be contractually binding on BHEL/ Owner. All relevant site data/ information as may be necessary shall have to be obtained/ collected by the Bidder

2. SCOPE OF WORK

The work under these specifications broadly covers the complete work of handling at storage yard/ stores, transportation to work site, calibration, pre-assembly, erection, testing, pre-commissioning, and handing over of Main Plant Electrical System of Unit#1 and BOP of 3x800MW PVUNL Patratu Thermal Power Plant including Flue Gas Desulphurization (FGD), Static Catalytic Reduction (SCR), Electrostatic Precipitator (ESP). The main components of this package are:

a) Junction boxes and Push buttons.
b) Structural Steel
c) 11kV/ 3.3kV/ 0.415kV Switchgear/ PCC/ MCC.
d) AC/ DC Starter panel/ Local starter boxes/ Power distribution boxes/ Marshalling boxes.
e) Control & Relay Panels.
f) 220V DC Battery System.
g) Variable Frequency Drive for CEP.
h) LT Bus Duct (NSPBD).
i) 11/ 3.3kV Segregated Phase Bus Duct (SPBD).
j) 27kV Isolated Phase Bus Duct (IPBD).
k) Oil Filled Power Transformers (GT, UT, UAT, ST, SAT and Other Aux Transformers).
l) Dry type transformers.
m) Soot Blower System.
n) Only Testing & Commissioning of certain items as mentioned in the BOQ erected by other agencies (Electrical Hoists, HVR Transformers, DG sets, etc.)
o) Other Misc. associated equipment (BOP-Compressed Air/ MRS/ AC & Ventilation system).

2.1 JUNCTION BOXES AND PUSH BUTTONS

2.1.1 Different types of junction boxes are to be erected by the contractor as per attached BOQ. The junction boxes are to be located at the locations jointly decided at site during erection. The junction boxes are to be erected on the frames fabricated at site. The installation of Junction Boxes/ Push Buttons (JB/ PB) should be checked for correctness and their functions.

2.1.2 Junction boxes shall be mounted at a height of 1200mm above floor level or as specified in the drawings and shall be adequately supported/ mounted on masonry wall by means of anchor fasteners/ expandable bolts or shall be mounted on an angle, plate or other structural supports fixed to floor, wall, ceiling or equipment foundations.

2.2 STRUCTURAL STEEL FABRICATION AND INSTALLATION (INSTRUMENT/ JUNCTION BOX FRAME/ & MISC STRUCTURES FABRICATION)

2.2.1 Structural steel material like MS angles, channels, beams, flats, plates etc. shall be supplied in running meter and the same shall be used for misc. fabrication if required. and the same shall be used for fabrication of panel base frame, canopies for instruments/ panels/ drives/ JBs/ Push Buttons etc., Instrument/ Junction box frames, Impulse Pipe/ Instrument Air Pipe supports and instruments etc.

2.2.2 This shall include cutting into size, conduiting of end connections, if required, welding, grinding of excess weld deposits, drilling of holes for mounting of device/ instrument, installation at location, leveling, alignment, providing bracings, painting etc. No gas cut holes will be permitted. Contractor to follow the BHEL supplied welding schedule and welding procedures.

2.2.3 All the fabricated supports/ frames for instruments, trays, pipes, electrical equipment, etc., shall be painted after sand blasting and surface preparation as per painting specifications (refer clause no. 2.29 for details). Paints and other associated items are in the scope of the contractor.

2.2.4 Frame installation at site may involve mounting either on concrete floor by grouting/ using anchor fasteners or on steel structure by welding etc. All consumables including anchor fasteners shall be arranged by the contractor. Where required, as part of work, concrete floors may have to be chipped out to reinforcement depth for anchoring the frames. Wherever grouting is required, contractor shall arrange all the required material including cement/ grout mix, shuttering etc., necessary labour and meet all other requirements as part of work. All consumables including anchor fasteners shall be arranged by the contractor.

2.2.5 In certain packages, galvanized members of junction box frames and instrument racks shall be supplied in cut to sizes and frame assemblies are required to be done as per drawing by bolting/ welding. The installation rate as quoted shall include the assembling of the frames.

2.2.6 Gas cutting of tray/ impulse pipe support and holes in frame is not permitted. Only hacksaw cutting/ drilled hole shall be permitted.

2.3 11kV/ 6.6kV/ 3.3kV HT SWITCHGEAR, 415V LT SWITCHGEAR/ MCC & DC DISTRIBUTION BOARD/ PANELS/ STARTER BOX ETC.

2.3.1 Checking of installation for correctness.

2.3.2 Mechanical functional checking/ adjustment of individual breaker.

2.3.3 Measurement of Insulation resistance of individual breaker, complete switchgear board and combined insulation resistance of individual breaker with cable connected to drives.

2.3.4 Testing of Protection Relay, Thermal over relay, Power transducers, Energy/ Ammeters, Voltmeters, Power factor, frequency, tri-vector meters & metering etc. in static & dynamic condition relay.

2.3.5 Conducting test such as Insulation Resistance measurement, Ratio, polarity, magnetization characteristic, winding resistance on CT and PT.

2.3.6 Checking of electrical control & protection interlock of individual breaker and integration with other system.

2.3.7 Calibration of energy meters, tri-vector meters, voltmeters, ammeters, power current & voltage transducers etc.

2.3.8 Provide assistance for checking the electrical operation of individual breakers from remote panels/ MMI package (maxDNA system).

2.3.9 Other than the above, minor testing/ checks will also be involved in the generator area, which are also in the scope of the contractor. Any instruments/ tools etc. required for carrying out the above shall be arranged by the contractor within the quoted rates.

2.3.10 The scope of Testing and Commissioning of electrically operated actuators for valves, dampers, gates, soot blowers, Hoists etc., will include meggering, providing loop wire on actuator terminal block, adjustments of mechanical/ electrical or electronic position transmitters, setting of limit/ torque switches, cable checking, internal wiring checking, local/ remote operation from MCC & MMI package (max DNA system), replacement of limit/ torque switches if required.

2.3.11 Contractor shall cut/ open work, if needed, as per BHEL Engineer's instructions during commissioning for inspection, checking and make good the works after inspection is over.

2.3.12 Contractor has to repeat any test free of cost, even if already conducted, whenever required to prove and check the healthiness of system before power flow, such test could be primary injection and primary injection in CTs. CVT, Insulation resistance of system/ individual equipment, functional tests or any other tests as required by BHEL/ BHEL's client.

2.3.13 Electrical control panels, electronic control panels, HT/ LT switchgear, 415V LT MCC, are normally supplied in suit of either one/ two/ three or loose shipping sections with integral base frame or loose base frame. These panels may have to be installed as stand-alone or in-group consisting of number of panels in each row, depending upon the plant layout and foundation arrangement.

2.3.14 The panels shall be transported from stores to the place of installation in vertical position. Care shall be taken such that the switches, lamps, instruments etc. mounted on the panel do not get damaged during transit.

2.3.15 Installation of panel shall include fixing of base frame, leveling, alignment, fixing of anti-vibration pads, removal of side covers, fixing of cubical interconnection hardware, interconnection of bus bar/ bus bar jointing, wiring interconnection, welding and grouting of panels and base frames, mounting of panel canopy wherever supplied as part of panel, drilling of gland plates, sealing of panels/ cable entries. Where the base frame is not supplied as part of panel supply, the contractor shall fabricate the base frame from structural items at site. Payment for such fabrication will be effected on measured quantity at the rate applicable for structural steel fabrication and installation. Proper sealing of all the holes and cable entries (even if the cable has been laid by others) in the panel is in the contractor's scope.

2.3.16 Panels have to be shifted to their locations through floor openings, temporary openings like floor grills, door etc. Which shall be a part of work and no claim whatsoever will be entertained with regard to non-availability of opening as per shortest route etc. Panels have to be erected at different locations and elevation in powerhouse building, LT & HT Switchgear room, unit control room etc.

2.3.17 Panel and instruments once erected in position should be properly protected using necessary care to prevent ingress of dust/ moisture. This will have to be periodically cleaned and surroundings have to be kept tidy. These panels have to be regularly cleaned and surroundings tidy as per the instruction of BHEL Engineer till handing over of the set to customer is to be carried out by the contractor free of cost.

2.3.18 Whenever the panels are to be mounted on cable trenches, channel supports have to be provided across the cable trench over which the base frame of panel shall be mounted. For such work, structural steel fabrication & installation rate shall be applicable.

2.3.19 Normally the panels shall be supplied with meters, relays, electronic modules, and contactors, push buttons etc. mounted and pre-wired. However, if such devices are supplied loose/ separately for safety in transit, contractor shall mount the same as part of panel installation work and terminating the wires on devices. No extra payment shall be made for this.

2.3.20 Supplier's instruction manuals, packing slips, door keys etc. received along with the panels will be handed over to BHEL's Engineer on opening of the panels.

2.3.21 Minor civil works like drilling, chipping, punching holes and opening in concrete floors, slabs and brick walls, grouting, related to Rack, support installation, minor civil works required for installation of control panels, Junction boxes etc., shall be included in the erection cost of such items. Also, all miscellaneous civil works like chipping away and making good as necessary in floor slab/ wall for cabling/ earthing etc., as required are included in the scope for which no separate payment is applicable. The scope also includes supply of grouting material, if any.

2.3.22 For the panels erected by other agencies, commissioning/ calibration work and troubleshooting has to be carried out by the contractor as part of testing and commissioning work as per the quoted rates.

2.3.23 No separate payment shall be made for replacement of any devices like electronic modules, relays, conductors, terminal block, push buttons etc. which are found defective during pre-commissioning/ post-commissioning of any equipment/ item.

2.3.24 Interposing Relays (24/ 48V DC) along with mounting base shall be supplied separately for mounting in the various feeders of 11kV/ 6.6kV/ 3.3kV HT switchgear boards and 415V MCC Board/ Switchgear Panel Boards for unidirectional/ bi-directional drives, solenoid valves. 2 Nos. interposing relay are required to be mounted in each feeder. Internal wiring for these relays shall be pre-wired in the feeders, wires to be terminated on relay terminals (approximately quantity is 1000 Nos.) Contractor shall mount the same and terminate the wire as part of panel installation work and no extra payment shall be made for this work.

2.3.25 **The Erection, Testing and commissioning of 11kV/ 6.6kV/ 3.3kV HT Switchgear, 415V LT Switchgear/ MCC & DC Distribution Board/ Panels/ Starter Box etc.**

shall be in line with the Approved Field Quality Plans.

2.4 BATTERY/ BATTERY CHARGER

2.4.1 Lead Acid (or similar type) Batteries will be supplied loose along with battery interconnection in the series/ parallel links/ bus bar, lugs, steel/ wooden battery stand either assembled or knocked down condition, cables and associated charger.

2.4.2 Battery charging/ discharging is a continuous process and skilled manpower shall be deployed by the contractor round-the-clock.

2.4.3 Contractor shall arrange suitable load, cables, safety equipment and consumables for discharging the battery during charging and discharging cycle at his cost.

2.4.4 Contractor shall provide skilled manpower for periodic maintenance after the battery are fully charged for the activities such as checking of electrolyte level, specific gravity, topping up with distilled water and cleaning till the set is handed over to customer and record of the same shall be maintained and submitted before handing over of the system.

2.5 11/ 3.3kV/ 0.433kV (SEGREGATED/ NON-SEGREGATED) PHASE BUS DUCT

2.12.1 Segregated/ Non Segregated phase bus duct shall be supplied in loose shipping section along with hardware & other items. Each section shall be complete with Al alloy enclosure and conductor with epoxy bus support insulators arrangement. However other items such as silica gel breathers, inspection windows, rubber bellows, flexible & solid copper/ aluminium connector, bi-metallic strips, GI pre-fabricated supporting structure, wall frame assembly, set of hardware etc. shall be supplied loose. Galvanized iron earth bus shall be provided for enclosure continuity. All bolted joints shall have cadmium plated high tensile steel hardware.

2.12.2 Each set of SP bus duct is meant for interconnection from low voltage side of Unit, Unit Auxiliary and Station Transformer to 11kV/ 3.3kV switchgear board and bridging bus duct between the switchgear boards.

2.12.3 The bus duct consists of rectangular conductor made of aluminium alloy supported on post insulator and housed in aluminium sheet metal rectangular enclosure. The bus bar/ enclosures has bolted joints.

2.12.4 The bus duct shall be supported either from bottom of the concrete slab with embedded insert plate/ TG building supporting structural members and pocket provided on foundations. The bus duct assemblies, supporting structures shall be pre-fabricated and to be assembled as per lay out drawing. The erection and testing requirement shall be similar to the isolated phase bus duct, except the welding of bus bar and enclosures.

2.12.5 Each set of bus duct shall be supported with supporting structure,

which shall be fabricated from standard steel section and hot dip galvanized. All structure & bus duct assemble shall be erected as per drawings.

2.12.6 Pre-treatment consisting of degreasing, de-rusting etc. shall be done on all fabricated parts before painting of cubicles, cabinets, marshalling boxes and galvanization of steel structures.

2.12.7 Except for supporting steel structures which shall be galvanized, all equipment including bus duct enclosure shall be finished with an under coats of high quality primer followed by two coats of synthetic enamel paint which shall have a thickness not less than 50 microns.

2.12.8 The Bus Duct erection and commissioning shall be in line with the drawings released for construction.

2.12.9 **The Erection, Testing and commissioning of 11/ 3.3kV/ 0.433kV (Segregated/ Non-Segregated) Phase Bus Duct shall be in line with the Approved Field Quality Plans.**

2.6 ISOLATED PHASE BUS DUCT 27kV, 22250A MAIN RUN, 13000A DELTA RUN, & 2800A TAP-OFF RUN

2.6.1 Generator isolated bus duct is connected to low voltage side of single phase power transformers and main bus duct shall have tee off connection for unit transformer, LAVT cubicles, excitation transformer and air pressurization equipment. Bus duct consist of round/ octagonal/ box hollow aluminum alloy conductor and supported inside aluminum enclosure with post insulator. Flexible connections and expansion joints are provided at terminals and intermediate point to alleviate stresses. Ring type protection current transformer will be mounted inside the bus duct.

2.6.2 Isolated phase bus duct shall have tap connection for potential transformer, surge protector etc. housed in a metal clad cubicle, UAT and NG cubicle/ resistor cubicle. Various electrical tests have to be performed before and after erection.

2.6.3 Bus duct enclosure/ conductor is a continuous welded type. Conductor, enclosure, makeup pieces, shunts pieces etc. have to be welded at site.

2.6.4 The scope for Erection and testing of Isolated Phase Bus Duct shall include Transportation of material from stores/ storage yard, preparatory work such as erection of supporting structure, placement of sub-assemblies/ equipment's, alignment, edge preparation of conductor/ enclosure, welding of conductor/ enclosure, welding of shunt pieces & make up pieces, installation of seal off bushing &

wall frame assemblies, shorting links, earthing, LAVT cubicle, copper flexible, copper rubber bellows, weldable/ bolted flexible, installation of air pressurizing unit and its associated piping work and cable etc., testing and commissioning.

2.6.5 The Scope Would Include Neutral and Phase Bus Duct IR Value Measurement, Bus Duct Mounted CT's Testing, Loop Testing of CT Secondary Cabling by Secondary and Primary Injection of Bus duct, Contact Resistance Measurement for All Bus Duct Joints, HV Testing of Phase and Neutral Bus duct, Space Heater Circuit Testing and Charging, LAPT Cubicle IR Value Measurement, PTS Testing. Surge Capacitor Testing, LA Meggering, Pt Secondary Circuit Checking by Secondary and Primary Injection Testing, LAVT Cubicle Space Heater and Illumination Circuit Testing, Testing of Neutral Grounding Transformer for Ratio, IR Value and Resistance; Testing of Neutral Grounding Resistor for IR Value and Resistance, Space Heater and Illumination Circuit Charging for NGT/ NGR Cubicle, Bus duct Charging, LAVT Cubicle Charging.

2.6.6 Pre-fabricated G.I. supporting members shall be supplied in loose condition and are to be erected as per lay out drawing. Foundation pockets and embedded plate inserts shall be provided as per lay out drawing (on floor for bottom support and on bottom of concrete slabs). Contractor shall weld the supports on insert plate and shall carry out grouting including supply of grout materials after complete alignment/ bolting of structural members. If any modification required in supporting structure due to site conditions, the same shall be carried out without any extra cost. All welded joints shall be applied cold galvanizing zinc paint. Supply of Paints, primers etc. are in the scope of the supplier, within the quoted rates.

2.6.7 Required aluminum welding of conductor, enclosures, shunt, make up pieces, aluminum flexible etc. as detailed in drawings has to be carried out by contractor. MIG/ TIG welding shall be applicable. Contactor shall arrange necessary welding equipment/ accessory in sufficient number, filler wire, argon gas and other required consumables at his cost.

2.6.8 During erection of bus duct/ enclosure, makeup pieces and shunts, if any modifications needed to match the alignment shall be part of work and no extra payment shall be made.

2.6.9 All bolted joints and flanges shall be tightened with torque wrench to the approved torque. Wherever there are bolted joints, the same shall be cleaned and a layer of anti-oxidation paints shall be applied. Necessary paints etc. to be arranged by contractor within the quoted rates.

2.6.10 Top chamber/ adapter box for line and neutral side, hood assembly at UT hood assembly at excitation transformer and at LAVT cubicle end shall have drilled hole in flange. If there is any mismatch of the hole in above with

respect to the counter flange/ welded studs provided on UAT, LAVT and excitation cubicle, the contractor shall drill new holes if required.

2.6.11 Proper sequence shall be followed during erection to avoid any mismatch and alignment problem.

2.6.12 Prior to installation of bus duct assemblies in position, various components like conductor, insulator shall be inspected and cleaned and insulation resistance to be measured and recorded. If any insulator is found damaged, the same shall be replaced.

2.6.13 Electrical test on current transformers and potential transformers shall have to be carried out prior to installation & during pre-commissioning. The tests are insulation resistance measurement, winding resistance, magnetization characteristic, ratio test, water ingress and air leak test on assembled bus ducts.

2.6.14 Minor civil work such as chipping, leveling of foundation, providing pockets, drilling/ enlargement of holes in structure, bus bar etc. Which are incidental to the erection of bus duct shall not be treated as extra.

2.6.15 All miscellaneous items such as disconnecting links, flexible, shorting bars, hardware's, conduit for wiring, marshaling box, CTs and PTs wiring through conduit, earthing materials, bus bar fish plates etc. are part of bus duct installation. Hence separate breakup quantity is not given in BOQ.

2.6.16 Round makeup pieces for main and tee off duct shall be supplied in two halves and it involves but circumferential and horizontal welding at parting plain.

2.6.17 Air tightness and water tightness test have to be carried out on completion of bus duct installation. In case of any leakages, contractor has to rectify and bring to the required level of air tightness/ water tightness without any extra cost.

2.6.18 High voltage test of bus duct is to be carried out as per the instruction of BHEL engineer. Contractor shall arrange necessary test equipment/ instrument for conducting various electrical tests at his own cost.

2.6.19 Contractor has to carry out final painting as per standard colour code recommended by BHEL. Paints and consumables shall be in contractor's scope.

2.6.20 On welding joints, DPT test is required to be conducted.

2.6.21 Shunt pieces shall be supplied in two halves and to be welded between two-phase bus duct at transformer end. The shunt pieces to be welded on both the side on matching plain and bus duct circumference and horizontal plain

2.6.22 Contractor shall conduct 20 % radiography and 100% NDT test on welded joints as per approved FQP.

2.6.23 Any Enclosed/ attached drawings are for estimation and tendering

purpose only. Contractor has to ascertain quantum of work involved. The BOQ as furnished in this tender specification for Isolated Phase Bus Duct & Segregated Phase Bus Duct are tentative/ approximate. Contractor has to ascertain the quantum of work involved and quote the lump sum value, as called in the rate schedule, without any additional compensation for any variation in length or numbers of joints.

2.6.24 One end of the enclosure to be earthed to the station earth at shunt location where all three-phase enclosure are shorted. Wherever shunts are not provided, each phase should be earthed separately.

2.6.25 In case of bolted bus duct, phase split covers, rubber bellows, clamping earth straps to be connected to maintain the electrical continuity and in turn enclosure gets earthed at one point.

2.6.26 All other equipment such as LAVT, NG transformer/ resistor cubicle, air pressurization, CT chambers, junction boxes, etc. to be earthed at two points to the earth grid.

2.6.27 Pre-treatment consisting of degreasing, de-rusting etc. shall be done on all fabricated parts before painting of cubicles, cabinets, marshalling boxes and galvanization of steel structures.

2.6.28 Except for supporting steel structures which shall be galvanized, all equipment including bus duct enclosure shall be finished with an under coats of high quality primer followed by two coats of synthetic enamel paint which shall have a thickness not less than 50 microns.

2.6.29 **The Erection, Testing and commissioning of Isolated Phase Bus Duct 27kV, 22250A Main Run, 13000A Delta Run, & 2800A Tap-off Run Bus Ducts shall be in line with the Approved Field Quality Plans.**

2.7 POWER TRANSFORMERS & LT AUXILIARY TRANSFORMERS

2.7.1 Under this scope of work, following category of transformer are covered:

- Single Phase 315MVA, 420/ 27kV, ODAF cooled YNd11 (after 3-ph bank formation), Generator Transformer (GT).
- Three Phase 144/ 72/ 72MVA, 400/ 11.5/ 11.5kV Station Transformer (ST).
- Three Phase 10/ 12.5/ 16MVA, 11/ 11.5kV/ 11/ 3.5kV UAT, SAT, FGD Auxiliary, Miscellaneous Transformer.
- Three Phase 630/ 1000/ 1600/ 2000/ 2500/ 5000kVA, 11/ 0.433kV Auxiliary Transformer.
- Three Phase 2500kVA, 11/ 0.433kV DTT.
- Three Phase 2000kVA, 11/ 0.433kV DTT.

2.7.2 The scope of work under this head is defined as below:

2.7.2.1 Contractor shall transport the transformer tanks & accessories of LT power transformer and other transformers as mentioned above from BHEL stores/ Storage yard to respective foundation of unit.

2.7.2.2 Single Phase 315MVA, 420/ 27kV, ODAF cooled YNd11, Generator Transformer (GT)/ Three Phase 144/ 72/ 72MVA, 400/ 11.5/ 11.5kV Station Transformer (ST)/ Three Phase 10/ 12.5/ 16MVA, 11/ 11.5kV/ 11/ 3.5kV UAT, SAT, FGD Auxiliary, Miscellaneous Transformer shall be made available to the contractor 80 to 120meters (approximately) away from the respective foundation, further transport and shifting to the foundation shall be in the scope of this work. The shifting operation may require dragging either on ground with suitable arrangement or dragging after fixing of wheels on rail track. It may also require turning of transformer at suitable locations en-route to foundation. The contractor shall arrange wooden sleepers, winches, jacks, rails, crane, plates etc. at his cost for this operation. However, all loose accessories shall have to be shifted from stores/ storage yard.

2.7.2.3 The transformers shall be handled in such a manner so that no jerk is transferred to the core, winding and internals of the transformer.

2.7.2.4 Transformers are generally supplied in partly assembled condition either filled with oil up to the core end winding level or gas filled. Accessories, like radiators, conservator tank, pipes, fittings, hardware's, gaskets, Buchholz relay, marshaling box, relief vent, valves, pumps, cooling fans, cables, bushings, radiator headers/ fans, rollers, tap changer drive unit, cables of various sizes for interconnection from marshaling control box to field devices, bushing turrets and oil in Barrels shall be supplied loose.

2.7.2.5 Placement on plinth, alignment with respect to the foundation and lay out drawings.

2.7.2.6 Internal inspection to verify the intactness of core and winding, tap changer leads, off-load switch/ on load tap changer, measurement of core and core bolt insulation.

2.7.2.7 In case transformers are supplied partly oil filled/ gas filled, after internal inspection, the transformer shall be kept under vacuum (for a period to be decided by site engineer) and treated oil to be filled up to required level.

2.7.2.8 Each drum of oil to be tested for BDV and if BDV is less, then each drum should be filtered separately. This treated oil to be filled in the transformers and auxiliaries.

2.7.2.9 Contractor shall arrange storage tank of approx. 10 kl capacity, internally sand blasted and with one coat of oil resistance paint. Oil from drums to be transferred in storage tank and filtration to be carried out to achieve the required

BDV/ withstand value. This treated oil to be filled in the transformers and auxiliaries. However, for low capacity transformer, a separate storage tank for mass filtration may not be required.

2.7.2.10 All the accessories shall be assembled/ mounted as per OGA drawings and these should be thoroughly cleaned by spirit prior to installation.

2.7.2.11 Drying out of transformer and filtration of oil in cooling bank, pipeline, diverter tank of tap changer etc. to be done with ultra-vacuum filtering machine of adequate capacity. Drying out process shall be carried out round-the-clock and contractor shall deploy trained manpower for this purpose.

2.7.2.12 During dry out process, contractor has to plot the curve for insulation resistance value/ time/ oil temperature. Hourly reading to be recorded till completion of the dry out.

2.7.2.13 The criteria for deciding completion of drying out shall be breakdown value of oil, PPM value of contaminants in oil, resistively of oil, insulation resistance value and polarization index. The contractor shall carry out minimum two cycles of dry out for achieving the required dew point or as per the BHEL Standards.

2.7.2.14 Filter machine capacity if found to be inadequate, or in case of failure of an existing machine, alternative arrangement is required to be done to meet the required result and time. It is to be particularly noted that that as per exigencies of site working contractor will have to arrange more oil filtration machines as per site requirement.

2.7.2.15 Due to unforeseen reasons the commissioning of transformer is delayed after first drying out and if required, the contractor shall carry out the oil filtration of assembled transformer. For full re-filtration, payment will be made at 25% of quoted price of Transformer.

2.7.2.16 Contractor shall arrange required testing equipment for carrying out electrical test like voltage ratio, turn ratio, vector group, magnetic balance, winding resistance measurements, and BDV value of oil, Tan Delta Measurement of Bushings & Winding, insulation resistance, measurement of oil PPM, Acidity, Resistivity, SFRA and TAN Delta Test. The Contractor shall arrange to carry out DGA Test of Oil Sample before and after first successful charging of Generator Transformer and Station Transformer. The contractor shall arrange oil sample testing for PPM/ Resistivity or any other tests applicable for oil sample at approved testing laboratory/ BHEL Bhopal at his own cost including all incidental expenses.

2.7.2.17 Contractor shall discuss and finalize installation and testing activity procedure with BHEL/ customer prior to starting the work.

2.7.2.18 Tests are also required to be conducted on Current Transformer, Potential Transformer & prior to/ after installation. Contractor shall also carryout oil

processing/ filtration to achieve the desired results before charging and handing over of the entire system.

2.7.2.19 Contractor should have valid electrical contractor license to carry out installation of high voltage equipment.

2.7.2.20 Internal inspection on receipt of Transformer at site in presence of supplier is made mandatory. There may be time gap between first inspection and second inspection (which may be just before assembly of transformer accessories). Nitrogen cylinders of appropriate purity shall be arranged by contractor as a part of scope of work within the quoted rates for transformer.

2.7.2.21 Process of Nitrogen (Use only dry Nitrogen gas to IS: 1747 with -60 Dew point) purging of transformer winding before proceeding for oil filling/ filtration is made mandatory by BHEL. Contractor shall arrange adequate number of nitrogen cylinders of appropriate purity. The purging process will be declared as completed on successful achievement of dew point measurement. It may be required to repeat the process till acceptable value of dew point is achieved.

2.7.2.22 Due to unforeseen reasons, if already tested and erected HV Bushing of Generator Transformer and Station Transformer need to replace at site, the contractor shall carry out the dis-mantling and replacement work of HV Bushing @20% of quoted price in case of 1-Phase Generator Transformer and @15% of quoted price in case of Station Transformer for replacement of one HV bushing.

2.7.2.23 Due to Unavailability of Civil Foundation or Rail Cum Road for GT/ ST/ UT/ UAT/ SAT/ JT/ CHP/ AHP, if the transformers were unloaded more than the distance mentioned in TCC, the contractor shall carry out the dragging work up to their actual scope of distance @0.1% of quoted price of GT/ ST/ UT/ UAT/ SAT per meter.

2.7.3 Following notes/ tests/ jobs for power transformer shall also be carried out by Contractor.

2.7.3.1 Verify the Air cell of the Conservator and its MOG before erection. If possible, remove the Air cell from conservator and thoroughly check the conservator and MOG and its Float.

2.7.3.2 Insure the Conservator Prismatic Gauge Glass hardware are in order to avoid leakage/ Spillage of oil from that portion.

2.7.3.3 Oil pressure test on fully erected Transformer to be conducted

2.7.3.4 All components dispatched separately should be cleaned inside and outside before being fitted

2.7.3.5 Assembling of bushings is carried out according to bushings installation manual available. In case of draw rod/ lead connection of bushing with transformer lead, half connector joints to be insulated with 3 layers of crepe paper

after making proper.

2.7.3.6 Individual radiator/ cooler and pipework to be flushed with compressed air followed by carrying out Pressure test on individual radiator/ cooler Bank to check any leakages/ damages before start of Erection at site.

2.7.3.7 The lower and upper shut-off valves for radiators/ coolers and possible headers shall be open during evacuation and oil-filling. If coolers are placed on suspension beams, which are mounted at right angle to the tank, the suspension beams shall be supported against the ground during the evacuation. Also radiators mounted on the tank wall shall be supported in a similar way. The hose for filling of oil is connected to the bottom valve of the transformer which must not be opened until the hose has been de-aerated and completely filled with oil.

2.7.3.8 All shorting links on tanks, turrets and fittings to be provided as per OGA

2.7.3.9 Oil Sampling shall be done as per IS 9434/ IEC: 60567.

2.7.3.10 Oil filling in the conservator and also draining whenever required must be done very slowly. During oil filling, pressure in the air cell should not exceed 0.1kg/ sq.cm (1.5 psi).

2.7.3.11 Check the CCU unit and also verify the outputs are working or not. also calibrate the CCU unit with the WTI/ OTI.

2.7.3.12 Proper Tightness of the adjustable Resistor screw of WTI.

2.7.3.13 Contact resistance of all the bolted joints in the neutral formation & grounding path.

2.7.4 **The Erection, Testing and Commissioning of GT, ST, UAT, and other auxiliary transformers shall be in line with the Approved Field Quality Plans.**

2.8 NAS FILTRATION & PARTICLE COUNTING OF OIL TYPE TRANSFORMER (420kV & ABOVE):

Procedure to be followed for Hot oil circulation/ drying out, oil rinsing, particle reduction and particle counting as follows:

After completion of the hot oil circulation in main tank and cooler/ radiator system separately, the valves between main tank and cooler/ radiator system to be opened to allow the mixing of oil. The oil rinsing shall be carried out by connecting transformer to the oil rinsing plant connected with particle counter. Initially the oil inlet is connected to the lower portion of the tank and the outlet to the upper portion and start rinsing plant for circulation and creating turbulence of oil for approx. 1 hour. Thereafter the connection to be reversed (Oil inlet to the top of tank and oil outlet to the bottom of tank) and start rinsing plant. This process to be continued till the 2 consecutive readings

of particle content of the insulation oil is achieved as per below:

lf measured with particle counter which works on ISO4402 and ISO 4406:1987	≥ 2 microns should be <10000 particle/ liter.
lf measured with particle counter which works on ISO 11171 and ISO 4406:1999	≥ 4 microns should be <15000 particle/ liter.

lt is recommended to use 35−40 kl/ hour capacity of pump in the rinsing plant.

2.9 SOOT BLOWER SYSTEM

2.9.1 Soot blower system comprises of motor control center having various feeders of motor starters, micro-processor based PLC panel with mimic diagram and control station, push button boxes, junction boxes, wall blowers/ LRSB with drive mechanism, integral control box with limit switch and internal wiring, inter connecting cables between field blowers and MCC, PLC panel etc. The scope of work for testing, commissioning covers the items/ devices as per rate schedule and the testing, commissioning of blowers shall be carried out in close co-ordination with mechanical agencies who shall be erecting these blowers and contractor shall obtain clearance from BHEL Engineer prior to start of work. The contractor shall carry out the following works under testing & commissioning: -

2.9.2 Pre-commissioning checks and tests on MCCs, blowers, PLC panels, energization of MCC and its feeders, wiring checks, insulation resistance measurements, testing of thermal over load relays etc.

2.9.3 Adjustment of limit switches, torque switches, internal wiring checks, minor wiring modification to suit to system requirements for wall/ LRSB blowers.

2.9.4 Electric operation of each blower from local, MCC and PLC panels and from Unit control board.

2.9.5 Providing loop on terminal block of MCC individual feeders & blowers.

2.9.6 During pre-commissioning/ post-commissioning of soot blower system, the component like TB's, limit switch, torque switch, over load relay, contactors etc. if found defective, contractor shall replace such components without any extra payment.

2.10 DIGITAL AUTOMATIC VOLTAGE REGULATOR STATIC EXCITATION SYSTEM

2.10.1 System comprises of dry type excitation transformer, field breaker panels, regulation, field flashing, thyristors, DAVR, Mounting of Local Instrument,

Checking healthiness of diodes/ Fuses, Exciter Heater/ Blower, actuator commissioning, Dummy load test of DAVR, Checking from Control desk & Field related inputs/ outputs to commission the excitation system fully operational, field breaker panels/ cubicle along with copper bus bar/ flexible connectors including internal wiring, and associated inter connecting cables. No separate item rate is applicable. Rate quoted by contractor shall be inclusive of all above related to Excitation system.

2.11 ELECTROSTATIC PRECIPITATOR (ESP)

2.11.1 ESP shall have six flue gas passes and each pass comprises of HT rectifier transformer (silicon oil filled), Auxiliary Control Panels, electronic controller, LT Main switch board and its bus duct, drives for Rapping/ Collecting/ Gas damper screen, heating element for hopers/ shaft and supporting insulator housing, ash level indicator and EP management system (software based) including computer interface and associated interlock and protection.

2.11.2 HT rectifier transformer shall be erected by mechanical agencies. Scope of work covered under this contract is oil filtration of transformers and erection and testing of various devices as listed in rate schedule. Contractor shall provide silicon oil filter machine as a part of scope. Contractor has also to provide operator round-the-clock for oil filtration and other necessary testing equipment. Contractor shall utilize power supply for filter machine from the source, which is given for the construction purpose, and shall arrange required cables.

2.12 CONTROL & PROTECTION RELAY PANELS & ASSOCIATED EQUIPMENT SUCH AS SPBD/ NSPBD, GT, UNIT & STATION TRANSFORMER, GENERATOR CIRCUIT BREAKER, HT/ LT MOTORS AND OTHER ASSOCIATED EQUIPMENT ETC.

2.12.1 Integrated Electrical testing/ commissioning of Control and Protection Relay Panels & associated equipment, etc. shall involve various activities like relay testing/ setting, simulation checks, testing of energy meters, on/ off line functional checks on integrated system.

2.12.2 Relay testing in static condition Transformers, HT/ LT Drives, and associated system by secondary current injection at different current and recording the time duration.

2.12.3 Relay setting and checking the stability of protection relays in static and dynamic condition during the OCC (Open Circuit Characteristic) & SCC (Short Circuit Characteristic).

2.12.4 Testing and checking of control and protection interlock scheme in static condition and simulation of protection device contact from internal and external devices of all electrical panels.

2.12.5 Measurement of Insulations, Winding Resistance, Polarization Index of winding of HT/ LT Drives & associated equipment/ system, DC resistance test & Impedance test during pre-commissioning stage/ commissioning stage/ post commissioning stage.

2.12.6 Measurement of Insulations, Winding Resistance, Polarization Index of winding of Generator & associated equipment/ system, DC resistance test & Impedance test on rotor, Static excitation system at the time of rotor insertion as well as during pre-commissioning stage/ commissioning stage/ post commissioning stage.

2.12.7 Functional checks/ testing of synchronizing schemes, other electrical panels during the static and dynamic by simulation/ back charging of generator transformer conditions.

2.12.8 Monitoring & recording the various parameters during open circuit and short circuit conditions test on generator & associated field equipment like generator transformer, unit auxiliary transformer. Recording and monitoring measurement.

2.12.9 Testing of protection current transformer for ratio test by primary injection, magnetization characteristic, polarity test, and IR measurement. Functional checks of relays of protection system by primary injection.

2.12.10 Testing of potential transformer for ratio test by voltage ratio, polarity test, insulation resistance measurement etc., testing of surge capacitors, PT isolator in PTPS cubicle etc.

2.12.11 Measurement of Insulation resistance of individual equipment and connected together.

2.12.12 Calibration of energy meters, tri-vector meters, voltmeters, ammeters, current & power transducers etc.

2.12.13 Providing temporary shorting link on bus duct or any other location while testing & normalization after the test.

2.13 ELECTRICAL HOIST

Electrically operated hoist of capacity varying from 2 MT to 40 MT are provided for maintenance purpose of ID/ FD/ PA fans, Mill area, Air Heater, ESP and other area in boiler. Mechanical erections of hoist components such as runway beams, hoist carriage, drive unit, etc. shall be done by other agency. The scope of work covered in this tender specification for erection & commissioning is installation of DSL system and associated accessories. The scope of work for the contract in this package is as under:

2.13.1 **TEE IRON TYPE DSL SYSTEM: -** It consists of tee iron guide for cable trolley and associated supporting structural members, trailing cable, cable guide trolley, dog chain, switch fuse unit, limit switch, etc.

2.13.2 **TAUT WIRE TYPE DSL SYSTEM: -** It consists of end bracket, galvanized wire rope,

turn buckle/ straining bolt, real insulator/ cable guide trolley, cable, switch fuse unit, rope clamps, leather bands, dog chain, limit switch etc.

DSL system shall have to be erected at higher elevation. Contractor shall take all safety measures while carrying out the work.

a) Installation of tee iron & other structural steel member, unit rate for fabrication & installation shall be applicable and other items unit rate shall be paid, however cable dressing, fixing of leather bands, rope clamps and any incidental work such as making approaches for executing the work, scaffolding etc. shall be part of work.

b) Commissioning & testing of electrical hoists shall include panel wiring check, IR measurement, functional check, over load relay testing, trial run, providing assistance during load test, replacement of component if required etc. However, preparatory work for load test and arrangement of load etc. shall be done by other agency.

It shall be the responsibility of the contractor to carry out preliminary tests like checking connections, meggering etc. for LT motors commissioning, as a part of contract. These motors will generally be erected by other agencies. No separate rates are envisaged.

2.14 AUXILIARY BOILER

Auxiliary Boiler will be erected by another agency. The Electrical works of the auxiliary boiler is also in this scope including equipment earthing as per drawing. This auxiliary consists of LT MCC Panel and associated Bus duct and Accessories of I/ C from service transformer.

2.15 GENERATOR SYSTEM TESTING

2.15.1 The following major works also shall be in the scope of the Contractor

- Generator stator winding resistance and PI value measurement/ check.
- Generator rotor winding resistance, impedance, IR value measurement before and after rotor insertion.
- Generator Bushing HV test.
- Main exciter winding resistance, IR value measurement/ check.
- PMG winding resistance, IR value measurement/ check.
- Testing and commissioning of generator and exciter accessories viz., heaters, blowers, stroboscope, diodes, enclosure lighting, potential measurement of bearings (TE &EE) etc.
- Meggering during drying out of generator.
- Meggering of generator bushing and its accessories. This test has to be conducted many times during erection and commissioning stages.
- Commissioning of Stroboscope, Exciter Drier, Heater and Generator Air drier.
- Assistance in commissioning of H2 Drier Equipment.

2.15.2 Other than the above, minor testing/ checks will also be involved

in the generator area, which are also in the scope of the contractor. Any instruments/ tools etc. required for carrying out the above shall be arranged by the contractor within the quoted rates.

2.15.3 The scope of Testing and Commissioning of electrically operated actuators for valves, dampers, gates, soot blowers, Hoists, Cranes, Chain pulley etc., will include meggering, providing loop wire on actuator terminal block, adjustments of mechanical/ electrical or electronic position transmitters, setting of limit/ torque switches, cable checking, internal wiring checking, local/ remote operation from MCC & MMI package (max DNA system), replacement of limit/ torque switches if required.

2.15.4 Contractor shall cut/ open work, if needed, as per BHEL engineer's instructions during commissioning for inspection, checking and make good the works after inspection is over.

2.15.5 Contractor has to repeat any test free of cost, even if already conducted, whenever required to prove and check the healthiness of system before power flow, such test could be primary injection and primary injection in CTs. CVT, Insulation resistance of system/ individual equipment, functional tests or any other tests as required by BHEL/ BHEL's client.

2.16 BRIEF DESCRIPTION OF THE FGD SYSTEM

2.16.1 The FGD system shall be based on Wet Limestone Forced Oxidation process. Each unit shall be provided with an independent absorber.

2.16.2 Gas from terminal point on ID fan discharge duct shall be taken directly to the absorber through Booster Fans. In the absorber, SO2 in flue gas shall be removed by a spray of recirculating slurry, pumped by slurry recirculation pumps.

2.16.3 Compressed oxidation air shall be blown through the slurry in the oxidation tank, to oxidize the Calcium sulphite to gypsum.

2.16.4 Clean gas from the absorber shall be taken to the Wet Chimney through three stage mist eliminators.

2.16.5 Limestone to the absorbers of the units shall be supplied by a wet limestone grinding system, common for the units. Limestone shall be fed to the Limestone day silos which in turn will feed the Limestone to wet ball mill through a gravimetric feeder.

2.16.6 The gypsum from the absorber(s) shall be pumped by dedicated gypsum bleed pumps to a common Gypsum Dewatering system consisting of two streams (2x100%) of primary and secondary hydrocyclone and vacuum belt filters for gypsum dewatering. The water removed from the absorber shall be recycled to the absorbers. The waste water from the system shall be collected and neutralized using lime and neutralized effluent shall be pumped at required pressure to waste

water terminal point.

2.17 GENERAL GUIDELINES FOR ERECTION AND COMMISSIONING

2.17.1 **Contractor shall abide by the safety/ security rules and regulations as per the requirement of PVUNL and BHEL. Contractor shall obtain information about all safety and security norms of PVUNL well in advance. BHEL will not admit any claims whatsoever on account of Contractor's non-familiarization of site safety and security regulations.**

2.17.2 The intent of specification is to procure services according to the most modern and proven techniques and codes. The omission of specific reference to any method, equipment or material necessary for proper and efficient execution of this work shall not relieve the contractor of the responsibility of providing such facilities to complete the work without any extra compensation.

2.17.3 The work covered under this specification is of highly sophisticated nature, requiring the best quality workmanship, supervision, engineering and construction management. The contractor should ensure proper planning, successful & timely completion of the work to meet the overall project schedule. The contractor must deploy adequate quantity of tools & plants, measuring instruments, calibrating equipment, modern/ latest construction aids etc. He must also deploy adequate trained, qualified and experienced engineers, supervisory staff and skilled personnel. The manpower deployment identified by contractor should match requirement of sophistication involved with the items mentioned in the BOQ.

2.17.4 The work under this scope being quite sophisticated and also quite extensive, for proper planning, monitoring, reporting, etc. of ongoing works, the contractor shall establish his own computer (1no.) and printer (1no.) at his site office, along with suitable operator(s), consumables, etc. Non-establishment of above equipment will attract penalty @Rs 10,000/ - (Rs Ten thousand only) per month. These computers/ printers & accessories shall remain contractor's property/ ownership for all legal/ technical purposes. The contractor will be allowed to take out the same after completion of the site works as per instruction of BHEL Engineer.

2.17.5 BHEL uses its own software SOMS (Site Operation and Management System) for total project execution and billing. The contractor shall also provide adequate and suitable manpower for updating/ entries into SOMS in BHEL computers at site.

2.17.6 The work to be carried out under the scope of this specification covers the complete work of loading, handling, transporting, unloading, preassembly, erection, calibration, testing, air flushing, pre commissioning tests, commissioning of systems, trial run of various auxiliaries, achieving various activities till handing over of the unit to BHEL's customer, providing maintenance team to cater to guarantee responsibilities and maintenance thereafter.

2.17.7 The work shall be executed under the usual conditions affecting major power plant construction and in conjunction with numerous other operations at site. The contractor and his personnel shall cooperate with personnel of BHEL, BHEL's customer, customer's consultants and other contractors, coordinating his work with

others and proceed in a manner that shall not delay or hinder the progress of work or the project as a whole.

2.17.8 Contractor shall erect, align and commission all the equipment and auxiliaries as per the sequence & methodology prescribed by BHEL depending upon the technical requirements. Availability of materials and fronts will decide this. BHEL Engineer's decision regarding correctness of the work and method of working shall be final and binding on the contractor. No claims for extra payment from the contractor will be entertained on the ground of deviation from the methods/ sequences adopted in erection of similar sets elsewhere.

2.17.9 The services, tests and support to be provided by the agency for the work mentioned in the various sections of this tender are indicative and not exhaustive, but not limited to these for the completion of the work in all respects.

2.17.10 Plant materials should not be used for any temporary supports/ scaffolding/ preparing pre-assembly bed etc.

2.17.11 The contractor shall have total responsibility for all equipment and materials in his custody at contractor's stores, or any loose, semi-assembled, assembled or erected by him at site. He shall effectively protect the finished works from action of weather and from damages or defacement and shall also cover the finished parts immediately on completion of work as per BHEL Engineer's instructions. The machined surfaces/ finished surfaces should be greased and covered.

2.17.12 At all stages of work, equipment/ materials in the custody of contractor, including those erected, will have to be preserved as per the instructions of BHEL.

2.17.13 The contractor shall make all fixtures, temporary supports, steel structures required for jigs & fixtures, anchors for load and guide pulleys required for the work (including those specifically included in BHEL scope). However, necessary steel will be provided from the scrap/ surplus materials available at site.

2.17.14 The work shall conform to dimensions and tolerances specified in various drawings that will be provided during the erection. If any portion of the work is found to be defective in workmanship or not conforming to drawings or other specifications, the contractor shall dismantle and re-do the work duly replacing the defective materials at his own cost, failing which the work will be done departmentally or by engaging other agencies and recoveries will be effected from contractor's bills towards expenditure incurred including 30% departmental charges.

2.17.15 The terminal points decided by BHEL shall be final and binding on the contractor for deciding the scope of work and effecting payment for the work done.

2.17.16 During the course of erection, testing and commissioning of Electrical work, certain rework/ modification/ rectification/ repairs/ fabrication etc., will be necessary on account of feedback from various thermal power stations or units already commissioned and/ or units under erection and commissioning and also on account of design discrepancies and manufacturing defects and site operation/ maintenance requirements. This will also include modifications/ re-works suggested by BHEL/ customer/ other inspection group. Contractor shall carryout such rework/ modification/ rectification/ fabrication repairs etc. promptly and expeditiously. Claims of contractor, if any, for such works will be dealt as per clauses 2.15 of GCC.

2.17.17 In case any rework/ repair/ rectification/ modification/ fabrication etc. is required because of contractor's faulty workmanship which are noticed during the commissioning of, at any stages, the same shall be rectified by the contractor at his cost. If during the commissioning any improvement/ repair/ rework/ rectification/ fabrication/ modification due to design improvement is required, the same shall be carried out by the contractor promptly and expeditiously. Claim if any, for such work from the contractor shall be governed by clause no. 2.15 of GCC.

2.17.18 Daily log sheets indicating the details of work carried out, man-hours, consumables used etc., shall be maintained by the contractor and counter-signed by BHEL Engineer every day.

2.17.19 Contractor shall prepare Marked-Up drawings incorporating modifications and deviations from original drawings or prepare fresh sketch for actual installation/ connection details if need be, that can be converted to "As-built" drawings.

2.17.20 All transport equipment, handling equipment, tools, tackles, fixtures, equipment, materials, manpower, supervisors/ engineers, consumables, electrodes including oxygen, acetylene argon etc. gases, primers, paints etc.; except otherwise specified as BHEL scope of free issue; required for this scope of work shall be provided by the contractor. All expenditure including taxes and incidentals in this connection will have to be borne by him unless otherwise specified in the relevant clause. The contractor's quoted rates should be inclusive of all such contingencies. Electrodes shall be baked/ dried in the electrode drying oven (range 375–425°C) to the temperature and period specified by BHEL Engineer before their use. Necessary drying oven/ portable oven shall be provided by the contractor at his cost.

2.17.21 Equipment/ instruments required to be erected for this work, though not limited to but are generally as per rate schedule. For any items or class of work not specified herein but required for total completion of work, the same shall be carried out as per BHEL requirement. However, the payment of these items/ class of work shall be regulated as per the General Condition of the contract.

2.17.22 Overhauling, cleaning, revisioning, servicing of equipment/ instruments, valves etc. during erection and commissioning stages will be arranged by the contractor. However, gaskets/ packing for replacement will be provided by BHEL free of cost. All equipment shall be preserved and protected before and after erection as per the advice of BHEL Engineer.

2.17.23 The glands & lugs shall be supplied either loose or fitted with the equipment. Contractor shall take care of this aspect at the time of receipt of the equipment from BHEL stores. Contractor shall account for the quantities received with the equipment and shall hand over the same to cabling agency under intimation to BHEL Engineer. Contractor shall extend all necessary help & co-ordinate with the cabling agency during the course of work.

2.17.24 The contractor shall collect all scrap materials periodically from various levels of powerhouse, working area of the power station, auxiliary and piping around power station and collect the same at one place earmarked for the same. Loads of scraps are to be shifted to a place earmarked by BHEL. Failure to collect the scrap is likely to lead to accidents and as such, BHEL reserves the right to collect and remove the scrap

at contractor's risk and cost, if there is any failure on the part of contractor in this respect. **1% value of each RA bill will be earmarked against compliance of the above, to be released only on satisfactory collection and deposit of scrap as stated above. In case of failure of contractor to comply with this requirement, BHEL will make suitable arrangement at contractor's risk and cost. In such case, any expenditure over and above the withheld 1% amount will also be recovered suitably from the RA bills of vendor.**

2.17.25 All works such as cleaning, leveling, aligning, trial assembly, dismantling of certain equipment/ components for checking and cleaning, surface preparation, fabrication of sheets, tubes and pipes as per general engineering practice and as per BHEL Engineer's instructions at site, cutting, gouging, weld depositing, grinding, straightening, chamfering, filing of cut outs/ openings for mounting of console inserts, modules, indicators, recorders, chipping, drilling of holes, reaming, scrapping, cable laying, dressing, lapping, fitting up etc. as may be applicable in such erection works are treated as incidentals to erection work and are necessary to complete the work satisfactorily shall be carried out by the contractor as part of the work within the quoted rates.

2.17.26 All equipment shall be handled very carefully to prevent any damage or loss. No bare wire ropes, slings etc. shall be used for unloading and/ or handling of the equipment without the specific written permission of the BHEL Engineer. The equipment from the storage yard shall be moved to the actual site of erection/ location at the appropriate time as per the direction of BHEL Engineer so as to avoid damage/ loss of such equipment at site.

2.17.27 Contractor shall provide necessary resources for completion of such work within the stipulated time schedule. Value of such work shall be included while computing the total value of work finally executed for all contractual purposes, particularly for contract variation purpose.

2.17.28 The contractor should take all reasonable care to protect equipment and materials under his custody either in his stores or at site. Copper tubing, brass fittings, brass valves etc. forming an integral part of equipment or system are liable to greater damages/ pilferages/ theft/ losses. It will be responsibility of contractor to arrange for adequate security round the clock for protection from such damages/ pilferages/ theft/ losses.

2.17.29 Housekeeping in the erection and preassembly area is as important as well-planned and orderly work. The access to site for inspection approaches by BHEL and customer engineers and leading of the material shall be made available by the contractor at all times. The shifting and re-shifting of erection materials, tools and plants and clearance of restrictions, filling of ditches, undulation near preassembly, boiler area and switch yard area is the responsibility of the contractor. Contractor should visit the site and acquaint himself with all restrictions and difficulties that he may encounter during erection/ commissioning stages.

2.17.30 The contractor shall ensure that all the packing materials and protection devices used for the various equipment during transit and storage are removed before the equipment are erected in position.

2.17.31 All pipes and tubes, equipment, instruments issued to contractor and kept at site for erection shall be covered with plastic caps/ steel caps or shall be closed with suitable plugs by the contractor.

2.17.32 Contractor shall calibrate, erect, commission all the equipment, cabinets/ panels and cabling etc. as per sequence prescribed by BHEL at site. The sequence of erection/ commissioning methodology will be decided by the BHEL Engineers depending upon the availability of materials/ work fronts etc. No claims for extra payment from the contractor will be entertained on the grounds of deviation from the methods of erection/ commissioning adopted in erection/ commissioning of similar jobs or for any reasons whatsoever.

2.17.33 Descriptions of certain packages appearing in the rate schedule are available in this section and also in Appendix-I (Chapter-XI), to give general idea to bidder about the type of equipment to be erected, calibrated, tested and commissioned.

2.17.34 BHEL reserves right to recover from the contractor any loss, which arises out of undue delay/ discrepancy/ shortage/ damage, or any other causes due to contractor's lapse during any stage of work. Any loss to BHEL due to contractor's lapse shall have to be made good by the contractor.

2.17.35 The contractor shall take delivery of the components, equipment's, chemicals, lubricants etc. from the BHEL stores/ storage area after getting the approval of BHEL engineer on standard indent forms of BHEL. Complete and detailed account of the materials and equipment's after usage shall be submitted to the BHEL and reconciled periodically.

2.17.36 The contractor shall take delivery of equipment, materials from the storage yard/ stores/ sheds of BHEL/ customer. He shall also make arrangements for verification of equipment, transportation up to site of work, safe custody, watch and ward of equipment after it has been handed over to him till these are fully erected, tested and commissioned and taken over by the customer. The contractor should note that the transport of equipment's to erection site, assembly yards etc. should be done by the prescribed route without disturbing the other works and contractors and in the most professional manner. Special equipment's such as measuring and control equipment's, panels, electronic items, SF6 breakers, switches, cables, conduits etc. shall be stored when taken over by the contractor in appropriate manner as per BHEL's instructions.

2.17.37 Contractor shall plan and transport equipment's, components from storage to erection site and erect them in such a manner and sequence that material accumulation at site does not lead to congestion at site of work. Materials shall be stacked neatly, preserved and stored in the contractor's shed and at work areas in an orderly manner. In case it is necessary to shift and re-stack the materials kept at work areas/ site to enable other agencies to carry out their work or for any other reason, contractor shall do it most expeditiously. No claim for extra payment for such work will be entertained.

2.17.38 **The weight & dimension as mentioned against the individual items in Price Bid Part –II Rate Schedules or elsewhere in the tender specification are indicative and approximate and there may be variation in dimension & weight in actual**

supply of equipment. No rate variation shall be considered on this account. The scope of work & description of system/ equipment as given in the various clause of this tender specification and rate schedule are only for understanding the system requirements; contractor shall note this point and assess the volume of work prior to submit the offer.

2.17.39 For any class of work for which no specifications have been laid down in these specifications, work shall be executed as per the instructions of BHEL.

2.18 STATUTORY LICENCES AND OTHER RELATED REQUIREMENTS

The contractor will have the following valid certificates:

2.18.1 **The contractor should have the applicable Contractor Electrical License for Applicable Voltage System to work in Jharkhand State.**

2.18.2 **Contractor should have obtained valid Electrical Contractor-ship License to carry out the Erection, Testing & Commissioning work on High/ Low Voltage electrical equipment from the appropriate statutory authority of concerned state or Central Electricity Authority, as the case may be. All fees and expenses in this regard shall be to the contractor's account.**

2.18.3 **Supervisory Competency Certificate of Applicable Voltage for equipment erection, testing & commissioning classes as defined in this tender specification, issued by applicable appropriate State or Central Statutory Authority. During the execution of work minimum two persons should be posted at site who have valid Supervisory Competency Certificate.**

2.18.4 **Contractor shall arrange inspection of concerned Statutory Authority for the installation, testing & commissioning of High/ Low voltage equipment covered under this tender specification and obtain their approval in appropriate format prior to charging of the equipment.**

2.18.5 **Contractor shall be responsible for all necessary liasioning work with Statutory Authority towards the certification of installation/ works. BHEL/ BHEL's Customer shall provide technical assistance, drawings & documents for submission to Statutory Authority. Contractor shall provide all logistical services in this regard.**

2.18.6 **All necessary certificates and licenses, permits & clearances required to carry out this work from the respective statutory authorities are to be arranged by the contractor expeditiously at his cost in time to ensure smooth progress of work.**

2.18.7 **If the contractor does not have these licenses and statutory requirements, then the contractor has to arrange them to work in the concerned state (Jharkhand) where the project is being executed within 6 weeks of mobilization at site for carrying out the works covered under this contract.**

2.19 COLLECTION OF MATERIALS

2.19.1 The contractor shall take delivery of equipment, materials from the storage yard/ stores/ sheds of BHEL/ customer. He shall also make arrangements for verification of equipment, safe custody, watch and ward of equipment after it has been handed over

to him till these are fully erected, tested and commissioned and taken over by the customer. The contractor should note that the transport of equipment to erection site, assembly yards etc. should be done by the prescribed route in the most professional manner without disturbing other ongoing works of various contractors. Special equipment such as laboratory equipment, measuring and control equipment, electronic items, SF6 Breakers, gauges, panels, console inserts, switches, transmitters, controllers, cables, conduits etc. shall be stored when taken over by the contractor in appropriate manner as per BHEL's instructions. The contractor should also note that while taking delivery of materials from BHEL stores (open/ closed), it may be necessary to handle other items which could be blocking the exit route of the materials. This aspect shall be taken care of in the quoted rates and no extra payment shall be done in this regard. It shall be the contractor's responsibility to arrange necessary cranes/ tractors, trailer, trucks, slings, labor, etc., for transport of equipment.

2.19.2 The distance between storage area and erection site is approx. 3-4km. However, this location may change at the discretion of the BHEL's customer. Contractor shall plan and transport equipment, components from storage to erection site and erect them in such a manner and sequence that material accumulation at site does not lead to congestion at site of work. Materials shall be stacked neatly, preserved and stored in the Contractor's shed and at work areas in an orderly manner. In case it is necessary to shift and re-stack the materials kept at work areas/ site to enable other agencies to carry out their work or for any other reason, same shall be done by Contractor most expeditiously as incidental to work.

2.19.3 The panels shall be transported from stores to the place of installation in vertical position. Care shall be taken such that the switches, lamps, instruments etc. mounted on the panel do not get damaged during transit.

2.19.4 Contractor shall plan and transport equipment/ components from storage yard/ sheds to erection site and erect them in such a manner and in a sequence that material accumulation at site should not lead to congestion. Materials shall be stacked neatly, preserved and stored in the contractor's shed and work areas in an orderly manner. It may be specifically noted that the space available may be limited and accumulation of material may lead to the necessity of shifting and restacking the materials to enable other agencies to carry on with their work or to comply with customer's requirements. If required, the contractor shall arrange shifting of surplus material expeditiously (no claim for extra payment for such work will be entertained) failing which the same will be arranged by BHEL and all charges together with departmental charges will be recovered from his bills.

2.19.5 The contractor shall take delivery of the components, equipment, chemicals, lubricants etc. from the storage area/ sheds of BHEL/ customer after getting the approval of BHEL/ customer on standard indent forms to be specified by BHEL/ customer. Complete and detailed account of the materials and equipment after usage shall be submitted to the BHEL and reconciled periodically.

2.19.6 The contractor shall handover all the damaged, unused materials, package materials, containers, special transporting frames, gunny bags, parts/ materials remaining extra

over the normal requirement with proper identification tags in a packed condition to BHEL stores. In case of any misuse or use over actual design requirements, BHEL reserves the right to recover the cost of parts/ materials used in excess or misused. Decision of BHEL Engineer in this regard will be final and binding on the contractor.

2.19.7 Equipment/ instruments etc., under the scope of erection and commissioning are generally dispatched from BHEL's Manufacturing Units/ vendor's works to erection site well before the start of erection. Sometimes, such dispatched materials may get stuck up with transporters/ railways. The contractor shall provide support/ manpower for necessary chase up for removal of such bottlenecks in transportation. Also, for smaller items, it could be necessary to depute his person to personally carry certain items from works to site. Requirement of such activities; which will be decided by BHEL Engineer; and chase up activities, if required, shall be performed under authorization by BHEL. The above services shall be provided within the quoted rates.

2.19.8 The contractor shall make suitable security arrangements including employment of security personnel and ensure protection of all materials/ equipment in their custody and installed equipment's from theft/ fire/ pilferage and any other damages and losses.

2.20 GUIDELINES FOR HANDLING AND STORAGE

2.20.1 After unloading at site, the package of the equipment shall be inspected for external damage. In case the package is damaged, package number and details of damage should be noted. The details of damage should be reported to concerned site Engineer.

2.20.2 Cases should be opened/ unpacked using correct nail pullers. While opening the planks, care should be taken to see that equipment inside is not damaged. Cases should not be unpacked in areas where they are exposed to rain, water/ liquid splashing, dust or other harmful materials like chlorine gas, sulphur dioxide etc.

2.20.3 After opening the case, all supports provided for transport are to be removed with due care.

2.20.4 Immediately after unloading at site, the electronic equipment should be kept in a covered area. Handling and lifting of package should be done without jerks or impacts. Packing case should not be dropped or slid along the floor under any circumstances. Suitable forklift should be used to move the case to its final position. All above points are to be strictly followed as electronic equipment may get damaged due to vibration and shock.

2.20.5 Hinged frames should not be opened when equipment is not secured to floor as this is likely to cause it to topple over. The hinged frame can be opened only if the equipment is still fixed on to bottom wooden pallet.

2.20.6 The equipment should preferably be stored in its original package and should not be unpacked until it is absolutely necessary for its installation or advised by BHEL Engineer. The equipment should be best protected in its cases. It should be arranged away from walls.

2.20.7 The wooden pallet provided for packing itself can be retained on raised platform to

protect equipment from ground damps, sinking into and to circulate air under the stored equipment. This will also help in lifting the package with fork-lifter.

2.20.8 Periodic inspection of silica gel placed inside the equipment is necessary. It has to be replaced or regenerated when de-colorization takes place.

2.20.9 Due care should be taken to ensure that the equipment is not exposed to fumes, gases etc., which can affect electrical contacts of relays and terminal boards.

2.20.10 The storage room and the equipment should be checked at regular interval to ensure protection from termites, mould growth, condensation of water etc., which can damage the equipment.

2.20.11 All the equipment, materials and goods kept in the store room should be identified and registered in a book. Inspection report should be recorded. Any discrepancy observed should be communicated to site Engineer.

2.20.12 The packing material shall be retained if the cubicle is to be repacked after inspection.

2.20.13 All subassemblies should be kept in a separate place where they are easily accessible.

2.20.14 Subassemblies should have a protective cover in case they are stored without wooden packing/ case to prevent accumulation of dust. Silica gel packets should also be kept along with it.

2.20.15 Subassemblies should not be stacked one above the other.

2.20.16 The loose items supplied for the main equipment falls into various categories like tools, cables, prefabricated cables, console inserts, recorders, VDU/ CRT, other display units, printers, sensors and transducers, cable glands, cable ducts, frames, racks, etc. These are to be categorized and stored separately.

2.20.17 All the electronic modules shall be handled by qualified personnel only.

2.20.18 Electronic modules should only be touched when it is absolutely essential to do so.

2.20.19 Before touching any electronic module, the operator should discharge the static electricity by earthing himself or better still, ensure constant discharge by wearing an earthed wrist strap.

2.20.20 The operator should not wear clothing made entirely from synthetic fibres, but a mixture containing at least 65% cotton.

2.20.21 The PCB should always be held by front panel or by module frame and electronic components/ connectors should never be touched.

2.20.22 The electronic modules should not be placed close to television sets or CRT units.

2.20.23 Soldering irons and any other tools used must be grounded.

2.20.24 All modules using CMOS components are packed in antistatic bags when transported loose to avoid ESD failures. The antistatic bags must always be used to transport modules at site from one place to the other.

2.21 MEASUREMENTS, WASTAGE & CUTTING ALLOWANCE

2.21.1 The contractor shall not waste any materials issued to him. In case it is observed at any stage that the wastage/ excess utilization of materials is not within the permissible limits, recovery for the excess quantity used or wasted will be effected with departmental charges from the contractor. Decision of BHEL on this will be final and binding on the contractor.

2.21.2 For all payment purposes, measurement shall be made on the basis of the execution of

drawings/ physical measurements. Physical measurements shall be made by the contractor in the presence of the BHEL Engineer.

2.21.3 The measurement for cable, impulse pipes/ tubes, GI pipe, conduits, flexible conduits, trays etc., shall be made on the basis of length actually laid.

2.21.4 All the surplus, scrap and serviceable materials, out of the quantity issued to the contractor shall be returned to BHEL in good condition and as directed by the BHEL Engineer.

2.21.5 All materials returned to stores should carry aluminium tag indicating the size and type. Power cables more than 15 meters' length and C&I cables more than 5 meters' length is termed as serviceable material and shall be returned size wise and category wise to the owner's stores/ yard. Cable of serviceable length being returned to the stores in drums shall have their free ends sealed and the balance lengths on the drum(s) shall be noted and certified by the Engineer-in-charge. This shall be applicable only for the purpose of accounting the cables issued for installation.

2.21.6 While carrying out material reconciliation with contractor, all the above points will be taken into account. All serviceable material returned by the contractor shall be deducted from the quantities issued for the respective sizes and categories and the balance quantity will be taken as the net quantity issued to the contractor. Material reconciliation shall be done and allowable scrap quantity calculated as per wastage allowance percentage specified above. Any scrap/ wastage generated by the contractor in excess of the allowable percentage shall be charged at the rates decided by the Engineer whose decision shall be final and binding on the contractor.

2.21.7 The entire surplus, damaged, unused materials, packaging materials/ containers, special transporting frames, gunny bags, etc., shall be returned to BHEL stores by the contractor.

2.21.8 The contractor shall handover all parts/ materials remaining extra over the normal requirement with proper identification tags in a packed condition to BHEL stores. In case of any misuse or use over actual design requirements, BHEL reserves the right to recover the cost of parts/ materials used in excess or misused. Decision of BHEL engineer in this regard will be final and binding on the contractor.

2.21.9 The contractor shall ensure that all the packing materials and protection devices used for the various equipment's during transit and storage are removed before this equipment are erected in position.

2.21.10 For all site-fabricated steel items such as supports, racks, frame, canopy etc. physical measurement shall be made and then converted to tonnage. For steel material supplied to the contractor, all scrap shall be returned to BHEL stores with due accounting.

2.21.11 Every month the contractor shall submit an account for all the materials issued to him by BHEL in the standard Performa prescribed for this purpose by the site-in-charge.

2.21.12 The erection contractor shall make every effort to minimize wastage during erection work. Cutting and wastage allowance shall be computed on length, weight of material actually used, measured and accepted. In any case, the wastage shall not exceed the following limits:

S. No.	Item	%age Wastage of Erected Qty

a)	Each iron/ steel fabricated section	2
b)	Each size of power cables	1
c)	Each size of control	2
d)	GI pipes	1

2.21.13 If the actual wastage is more than the specified figure, then equivalent price of the excess portion will be deducted from the contractor's bill.

2.21.14 The cable take-off from drums shall be planned strategically such that jointing in the run of cables and wastage are avoided. For this purpose, the exact route length between various equipment/ panels as per the cable schedule shall be measured and the route length recorded before laying of the cables. Depending upon the route length and the type of cable required for various destinations, the cable drums shall be suitably selected for cable laying. Any jointing shall have to be approved by BHEL Engineer. All the cut pieces/ bits of cables, which are not used, shall be returned to the purchaser for accounting towards wastage. The cables damaged by the contractor shall have to be replaced by the contractor at his own cost.

2.21.15 **NOTE:**

a) Salvageable scrap shall mean lengths of pipes, multi-cables, other cables etc., that can be used one time or other at a later date and normally they are recovered from the cut-pieces of pipes, multicore cables, cables etc.

b) Non - Salvageable scrap means the lengths of tubes, pipes, multicore cables, cables etc., and they are from cut-pieces of tubes, pipes, multicore cables, cables etc., that cannot be used at all one time or other.

c) As per the contract material like cable tray and accessories, cables, tray supports shall be supplied by BHEL and customer. Reconciliation shall be done and duly submitted every month with joint signature to BHEL and Customer.

2.22 FINAL PAINTING

2.22.1 The contractor shall provide the Primer (ROZC as per IS:2074) for the scope of painting work indicated in Section-4 as well as for protection of site weld joints and gas cut locations. Contractor shall also arrange to provide the required thinner and other consumables, T&P etc. required for application of ROZC Primer. All paints and thinners shall be sourced only from BHEL approved manufacturers. Some of them are as listed under:

- M/ s Asian Paints
- M/ s Berger paints
- M/ s Jenson & Nicholson
- M/ s Shalimar Paints
- M/ s Akzo Nobel
- M/ s Kansai Nerolac Paints

2.22.2 In order to have consistency in painting system, it is preferable that all the supplies are sourced from one single manufacturer.

2.22.3 The contractor shall provide all the primer, paint, and other consumables like brush, cleaning agents etc. All T&Ps, manpower, supervision is in contractor's scope. Painting shall be carried out as per colour scheme approved by BHEL/ BHEL's customer.

2.22.4 Touch up paintings on damaged areas: Surface preparation by manual tools, wire brush/ emery paper etc. Minimum 6" peripheral area, adjoining to damaged area to be covered. f metal surface is exposed; it is to be painted with Zinc rich epoxy (70 micron) or suitable primer with existing paint scheme. If primer is intact, intermediate & top coat to be done with specified DFT in scheme.

2.22.5 All the fabricated frames, instrument racks, Junction box frame, trays/ impulse pipes, supports, panel base frame, etc., wherever applicable shall be first painted with two coats of primer paint (red chromate zinc primer) and then two coats of epoxy-based paint of approved shade (decided by BHEL Engineer) after thoroughly cleaning the surface of dust, rust, scale, grease, oil, etc., by wire brushing, scrapping or any other suitable method like sand blasting/ shot blasting. The quoted rates should be inclusive of all these including supply of paints and consumables.

2.22.6 All metal parts of the equipment including supports, structures, etc., as applicable shall be painted after thoroughly cleaning the surface from dust, rust, greases, oils, scales, etc., by wire brush, scrapping, sand blasting/ shot blasting (as applicable) as specified in relevant erection documents. The above parts shall then be painted with specified two coats of specified paint over the shop primer/ paint. Also, where the shop primer/ paint has peeled off, the affected area shall be cleaned thoroughly by the specified method and then primer coat applied. Similarly, certain components may be supplied without any primer/ paint coat from shop. The surface of such items shall be cleaned as per specifications, coated with suitable primer and then coated with final paint coats. The dry film thickness after final coat should be as per specification. The color, shade etc. shall be as per specification. Painting schedule will be furnished at site.

2.22.7 Other equipment like JBs, Panels, transmitter racks, Local gauge boards etc., shall be painted with two coats of synthetic enamel paint. The quoted rates should be inclusive of application of two final coats of synthetic enamel paint. All the consumables such as wire brush, other cleaning materials, painting implements, etc., is to be arranged by the contractor at his own cost. All equipment painting will be done by spray painting. The quoted rates should be inclusive of all these including

2.22.8 All damaged surfaces of galvanized or un-galvanized faces of steel structures etc. shall be brushed up and painted with red primer paint followed by two coats of aluminium paint/ enamel paint to the satisfaction of Engineer. The contractor has to arrange all the materials for painting at his cost.

2.22.9 Welded joints on GI earthing conductors shall be coated with one coat of bituminous paint in case of buried earth grid or earth flats to be laid in cable trench. For site welded GI strips/ wires which are exposed these are required to be painted with one coat of cold galvanizing zinc paint. Contractor to arrange the required paints and other items at his cost.

2.22.10 In case of GI Structure, the cold galvanizing paint to be applied as touch up where

ever needed. This is to be done as per instruction of BHEL Engineer.

2.22.11 The primer shall be compatible with the final coat paint schedule.

2.22.12 Full (spray) painting of transformers, bus ducts with two coats of paint as per specification.

2.22.13 Colour Banding, Legend and Identification Marking, Direction marking etc. shall be in scope of the contractor.

2.22.14 Touch-up painting of switchgear panel, 415V LT MCC, Control Panels or any other equipment/ devices wherever necessary. Treatment as per IS: 6005. Two coats of lead oxide primer followed by powder painting with final paint shade of RAL 9002.

2.22.15 The primer shall be compatible with the final coat paint schedule.

2.22.16 Supply of paint, primers, other consumables etc. for above and any other scope in these specifications shall be in Contractor's scope.

2.22.17 Irrespective to scopes of painting & supply of paint mentioned elsewhere it is to be noted that supply of paint, primers, other consumables etc. for all primer/ painting works to be done by the contractor, shall be in Contractor's scope. No dispute shall be entertained on the above matter.

2.22.18 **TRANSFORMERS & BUS DUCTS**

Exposed metal surfaces of Transformers and Bus Ducts erected by the contractor shall be painted with two coats of Finish Paint after thoroughly cleaning the surface from dust, rust, greases, oils, scales, etc., by wire brush, scrapping, machine buffing, water washing and any other appropriate method as specified in relevant erection documents. Bus Ducts shall first be coated with two coats of Primer before application of Finish Paint. Colour Banding, Legend and Identification Marking, Direction marking etc. shall be in scope of the contractor.

2.22.19 **STRUCTURAL**

Structural components may be supplied without any primer/ paint coat from shop. The surface of such items shall be cleaned as per specifications and then coated with two coats of Primer.

2.22.20 **PANELS, JUNCTION BOXES**

Panels and Junction Boxes shall be Touch-up painted as and where original shop paint is peeled off. Necessary surface cleaning and preparation shall be done by the contractor as per relevant painting codes followed by two coats of Primer and two coats of Finish Paint.

2.23 WELDING, NON-DESTRUCTIVE TESTING ETC.

2.23.1 Installation of equipment involves good quality welding, NDE checks etc.

2.23.2 Welder deployed for aluminium welding shall have experienced and approved by BHEL and BHEL's Customer after due qualification process/ testing.

2.23.3 Welding of all structural steel & aluminium shall be done only by the qualified and approved welders.

2.23.4 All the welders shall be tested and approved by BHEL Engineer/ BHEL's Customer

before they are actually engaged on work even though they may possess IBR/ other certificates. BHEL reserves the right to reject any welder without assigning any reason.

2.23.5 The welded surface shall be cleaned of slag and painted with primer paint to prevent corrosion. For this paint will be supplied by the contractor.

2.23.6 Welding electrodes have to be stored in enclosures having temperature and humidity control arrangement. This enclosure shall meet BHEL specifications.

2.23.7 Certain types of coated welding electrodes, prior to their use, call for baking for specified period and will have to be held at specified temperature for specified period. Also, during execution, the coated welding electrodes have to be carried in portable ovens.

2.24 INTEGRATED ELECTRICAL TESTING/ COMMISSIONING

2.24.1 The brief scope of work under is defined as below, but not limited to the following. Contractor shall discuss & finalize testing procedure with BHEL Engineer In-Charge for the test to be conducted on Generator Control & Relay Panel testing. Drawing & documents shall be provided by BHEL at the time of testing. BHEL decision in this regard shall be final and binding on the contractor.

2.24.2 The contractor shall prepare all erection/ commissioning log sheets and protocols/ test certificates as per field quality plan, and is signed by the concerned BHEL/ BHEL's Customer engineer and submit the same to BHEL engineer as per his instruction.

2.24.3 Contractor shall maintain the charged and commissioned equipment till the same is taken over by customer.

2.25 CALIBRATION, TESTING & COMMISSIONING

Calibration, testing & commissioning activity as specified in this technical specification and rate schedule against various equipment, devices, systems etc. are broadly classified below. However, there may be some overlapping between the activities (erection, calibration and testing, commissioning.) The classification of activity is only a guideline for understanding the total volume of work in each activity. The contractor shall have no claim for performing or providing manpower for such overlapping work, which is also within the scope of the work.

2.25.1 **CALIBRATION**

a) Verification after drawing of material of various types, range of the field devices with respect to instrument schedule, data sheet or system document.

b) Codification of instruments as per system tag numbers

c) Calibration/ adjustment of instrument as per system requirement/ set values.

d) Providing head correction in case of pressure measurement as per

calculated values or actual measured value for the instrument, which are used for interlock protections/ monitoring. This is generally applicable for turbine/ generator, lube oil systems, lube oil system of fans etc.

e) Verification of installation of instruments for range, type, tag number as per physical location of process point as per process, instrumentation diagram.

f) Checking and ensuring the proper function of instrument.

g) All the recorders shall be made functional with proper chart movement and ink marking.

h) Preparation of computerized calibration certificates in the formats specified by BHEL Engineers and getting those signed by the customer is in the scope of the contractor.

2.25.2 **ERECTION**

a) Withdrawal of material from store, verification, inspection as per shipping list, drawings and documents.

b) Preservation, up keeping, safe custody of the erected equipment till handing over to the customer.

c) Verification of installation as per drawing and document for the correctness of cabling, JBs, impulse pipe, various field device, panels, instruments etc.

d) Continuity check and IR value check of cables.

e) Verification of correction of cable termination with respect to instrument, electrical hook-up diagram, panel interconnection diagram, JB schedule.

f) Checking earthing of the equipment and cable shield wire continuity.

g) Energizing the functional group control panels and field devices.

h) Flushing of impulse pipe before making the instruments process connections through.

i) Any leakages, damages to impulse pipe, field device connections, air connections etc. Shall be fully attended by contractor.

j) All cable glands/ piping/ tubing to be fixed as per installation requirement before commissioning.

2.25.3 **TESTING, COMMISSIONING & TRIAL OPERATION**

a) Checking/ verification of binary/ analogue input and output signal from field and panel and up to recording/ indicating instrument/ HMI monitors.

b) Checking the operating electrical/ pneumatic drive through functional group panel, remote control desk, HMI, CRT operation and repeatability and smooth operation to be checked.

c) Checking the interlock, protection and alarm for various processes by simulation of field devices/ process changes.

d) Functional check of sub-loop control, sub group control and auto loop and fine tuning.

e) Adjustment of limit switches/ feedback position transmitter checking the

actuator for correct Limit switch operation for correct position indication and repeatability shall be ensured.

f) Motor IR value measurement, bearing/ winding RTD checking, drying out of motor after erection of equipment by mechanical agency, providing assistance for trial run of motor which includes monitoring temperature rise winding/ bearing during trial run.

g) Contractor shall prepare calibration/ testing report/ protocols.

h) During trial run of various systems, if the performance of any instrument is found erratic, un-satisfactory and requires re-adjustment, re-calibration etc., and the defect shall be attended by contractor.

i) Observing and checking the performance of the various devices on load/ process variation. Any deficiencies/ defect noticed during the variable load conditions, the same should be attended properly.

j) Observe the proper functioning of sub-group/ sub-loop control.

k) Check the operation of various controls in manual/ auto mode for smooth functioning.

l) Clearing of all bad/ invalid signals noticed during commissioning.

m) Providing necessary assistance for **Trial Operation** of the unit is in scope of this specification. Smooth operation and availability of all instrument/ controls of the systems installed under the scope herein, shall be ensured by the contractor. Contractor shall provide adequate number of skilled manpower and T&P for this purpose. Interruption in Trial Operation for reasons attributable to the Contractor shall result in re-start of the Trial Operation all over again; consequential extension in Time Schedule/ Contract Period shall be to the contractor's account.

n) If any small wiring correction or minor modification in control panel wiring is noticed during the commissioning, it shall be carried out as a part of commissioning activity.

o) **The trial run of the complete facility as an integral unit shall be conducted for 720 continuous hours. During the period of trial run of 720 hours, the unit shall operate continuously at full rated load for a period of not less than 72 hours.**

p) **Adequate manpower shall be provided round the clock during pre-commissioning and commissioning of the unit.**

2.25.4 **POST-COMMISSIONING**

a) Contractor shall rectify the defect observed/ informed by customer during the trial run.

b) Contractor shall submit the as- built drawing as per guidelines and instruction of BHEL Engineer.

c) After trial run/ handing over of the equipment, if due to unforeseen reasons, certain works crop up; the contractor shall provide all the assistance.

2.26 TROUBLESHOOTING DURING PLANT OPERATION

During pre-commissioning/ commissioning stages when the plant will be under various stages of operation, it will be necessary to have continuous (day and night) presence of suitable manpower along with required tools to attend to any defects etc. that may arise during such operation. The contractor will be required to put such personnel in shifts in the designated areas. The bidder must also take this aspect into consideration.

2.27 TESTING, PRE-COMMISSIONING, AND POST COMMISSIONING

2.27.1 The work is also inclusive of various commissioning activities of BHEL scope. The various activities, tests, trial runs may have to be repeated till satisfactory results are obtained and also to satisfy the requirements of customer/ consultant/ statutory authorities like boiler inspector, electrical inspector etc.

2.27.2 The contractor shall perform various activities during pre-commissioning, integrated testing, post-commissioning stages of equipment covered under this tender specification. It is responsibility of contractor to arranged tools & plants, test equipment, experienced engineers and technicians. Contractor shall earmark separate manpower for respective commissioning areas and they shall not be disturbed/ diverted for other work. The contractor's commissioning group shall work as per the instruction of BHEL Engineer and they shall coordinate day-to-day activity with other agency and BHEL/ Customer. The testing activity may have to be repeated till satisfactory results are obtained and also to satisfy the requirement of Customer/ statutory Authority.

2.27.3 The contractor shall simultaneously start testing & commissioning activities for equipment to match the mile stone activities of the project.

2.27.4 In case any malfunctioning and/ or defects are found during tests, trial runs such as loose components, undue noise or vibration, strain on connected equipment etc., the contractor shall immediately attend to these defects/ malfunctions and take necessary corrective measures. If any readjustment and realignment is necessary, the same shall be done as per BHEL Engineer's instructions.

2.27.5 The pre-commissioning activities will start prior to light up of boiler and various trials, commissioning operations shall continue till the unit is handed over to customer. Simultaneous commissioning activities will be in progress in various areas, checking of equipment erected, making ready for trial runs, alkali flushing, chemical cleaning, mass flushing etc. All these works need specialized gangs including electrician/ instrument mechanics in each area. Contractor shall earmark separate manpower for various commissioning activities. This manpower shall not be disturbed or diverted. The mobilization of these commissioning gangs shall be such that planned activities are taken up in time and also completed as per schedule and the work undertaken round the clock if required. It is the responsibility of contractor to discuss on day to day/ weekly/ monthly basis the requirement of manpower, consumables, tools and tackles with BHEL Engineer and arrange for the same. If at any time the requisite manpower, consumables, T&P are not arranged then BHEL shall make alternate arrangements and necessary recoveries with overhead cost will be made from the bills of the contractor.

2.27.6 During pre-commissioning, commissioning, post commissioning and trial operation stages of various systems, certain category of manpower with T&P and consumables will have to be provided to BHEL Commissioning Engineers exclusively at their disposal. It shall be the responsibility of the contractor to provide engineers, electricians, technicians, helpers, fitters etc. along with necessary consumables, hand tools, calibration equipment etc., for the various commissioning activities in progress. During peak months there could be requirements of separate commissioning gangs simultaneously in even up to 12 to 15 areas. Contractor has to augment the manpower as and when required as per work demand and necessity at site. The quoted rates shall include this.

2.27.7 The mobilization of these commissioning groups shall be such that planned activities are taken up in time and also completed as per schedule and work undertaken round the clock if required. It is responsibility of contractor to discuss on day to day/ weekly/ monthly basis the requirement of manpower, consumables, tools & tackles/ testing equipment with BHEL Engineers and arrange for the same. If at any time the requisite manpower, consumables, testing equipment etc. are not arranged then BHEL shall make alternative arrangements and necessary recoveries with overhead cost will be made from the running bills.

2.27.8 Contractor shall cut open works if needed as per BHEL Engineer's instructions during commissioning for inspection, checking and make good the works after inspection is over without any extra payment.

2.27.9 It shall be specifically noted that contractor manpower may have to be engaged round the clock simultaneously at different areas and hence considerable number of personnel and their overtime payment may be involved. This aspect must be considered by the contractor while quoting their rate. No additional compensation by for the same shall be payable, irrespective of number of persons engaged or number of working hours per day.

2.27.10 It is the responsibility of contractor to provide for necessary labor, tools and tackles and consumables till the completion of work under these specifications even in case erection, testing and commissioning of this work is delayed due to reasons not attributable to the contractor.

2.27.11 For electrical works, 415V and above, the contractor has to bring qualified electricians.

2.27.12 It shall be specifically noted that the contractor may have to work round the clock and in shifts during the pre-commissioning and commissioning period along with or without BHEL Engineers and hence considerable overtime payment is involved. The contractor’s quoted rates shall be inclusive of all these factors.

2.27.13 During the commissioning activities and carrying out various tests, if any of temporarily work such mounting of test equipment/ cabling etc. are required; the contractor shall carry out such work without any extra cost. The same shall be removed after completion of the activity.

2.27.14 During this period, though BHEL/ client’s staff will also be associated in the work, the contractor’s responsibility will be to arrange for complete requirement of men and required T&Ps, consumables, scaffolding and approaches etc., till such time the

commissioned unit is taken over for trial operations.

2.27.15 The contractor shall carry out any other tests as desired by BHEL Engineer on erected equipment covered under the scope of this contract during testing, pre-commissioning and commissioning, to demonstrate the completion of any part or whole of work performed by the contractor.

2.27.16 The pre-commissioning activities will start in phased manner to meet the various milestones and shall continue till equipment are commissioned fully with all connected equipment/ devices or handed over to customer for regular operation. In this duration other erection activities such as cabling etc., shall be carried out by other agencies even though equipment are partially commissioned/ charged. In order to co-ordinate the work such as issue of safety permit, normalization and compliance of other requirement, contractor shall keep team of experienced engineer, supervisor, technician and helper in each shift as decided by BHEL Engineer. The team shall take instruction from BHEL Engineer for day-to-day work and shall not be diverted for other work. No extra payment shall be made for their services.

Certain systems may be supplied with portable programming units, which are to be connected at various locations during pre-commissioning to handing over. Necessary cabling interconnecting the programming units and other connected panels has to be carried out by the contractor and are to be dismantled after work. For the purpose of testing, monitoring, commissioning, etc., these programming units will have to be repeatedly connected and disconnected at various locations. These will be considered as part of commissioning activities and no separate payment will be entertained for the above.

3. FACILITIES IN THE SCOPE OF CONTRACTOR/ BHEL (SCOPE MATRIX)

S. No.	Description PART I	Scope/ to be taken care by		Remarks
		BHEL	Bidder	
3.1	**ESTABLISHMENT**			
3.1.1	**FOR CONSTRUCTION PURPOSE:**			
a	Open space for office (as per availability)	Yes		Location will be finalized after joint survey with owner
b	Open space for storage (as per availability)	Yes		Location will be finalized after joint survey with owner
c	Construction of bidder's office, canteen and storage building including supply of materials and other services		Yes	
d	Bidder's all office equipment, office/ store/ canteen consumables		Yes	
e	Canteen facilities for the bidder's staff, supervisors and engineers etc.		Yes	
f	Firefighting equipment like buckets, extinguishers etc.		Yes	
g	Fencing of storage area, office, canteen etc. of the bidder		Yes	
3.1.2	**FOR LIVING PURPOSES OF THE BIDDER**			
a	Open space for labour colony (as per availability)		Yes	Agency has to make his own arrangement at his own cost.
b	Labour Colony with internal roads, sanitation, complying with statutory requirements		Yes	
3.2	**ELECTRICITY**			

S. No.	Description PART I	Scope/ to be taken care by		Remarks
		BHEL	Bidder	
3.2.1	Electricity for construction purposes only of Voltage 415/ 440V, 3phase, 50Hz	Yes		Chargeable based on the prevalent rates of DISCOM. Any penalty due to non-maintenance of power factor by the customer shall be passed on to the contractor.
a	Single point source	Yes		At a distance of 1000m from site (Distance is only tentative, it may vary up-to an extent depending on site condition)
b	Further distribution including all materials, Energy Meter, Protection devices and its service		Yes	
c	Duties and deposits including statutory clearances if applicable		Yes	
3.2.2	Electricity for the office, stores, canteen etc. of the bidder			
a	Single point source	Yes		At a distance of 1000m from site (Distance is only estimated, it may vary up-to an extent depending on site condition).
b	Further distribution including all materials, Energy Meter, Protection devices and its service		Yes	
c	Duties and deposits including statutory clearances if applicable		Yes	

S. No.	Description PART I	Scope/ to be taken care by		Remarks
		BHEL	Bidder	
3.2.3	Electricity for living accommodation of the bidder's staff, engineers, supervisors etc.		**Yes**	Agency has to make his own arrangement at his own cost.
a	Single point source		Yes	
b	Further distribution including all materials, Energy Meter, Protection devices and its service		Yes	
c	Duties and deposits including statutory clearances if applicable		Yes	
3.3	**WATER SUPPLY**			
3.3.1	For construction purposes: **(Single point source provided by BHEL on chargeable basis)**	**Yes**		
a	Making the water available from single point		**Yes**	Agency has to make his own arrangement at his own cost.
b	Further distribution as per the requirement of work including supply of materials and execution		Yes	
3.3.2	Water supply for bidder's office, stores, canteen etc.			
a	Making the water available at single point		Yes	
b	Further distribution as per the requirement of work including supply of materials and execution		Yes	
3.3.3	Water supply for Living Purpose			
a	Making the water available at single point		Yes	
b	Further distribution as per the requirement of work including supply of materials and execution		Yes	
3.4	**LIGHTING**			
a	For construction work (supply of all the necessary materials) 1. At office/ storage area 2. At the preassembly area 3. At the construction site/ area		Yes	

S. No.	Description **PART I**	Scope/ to be taken care by **BHEL**	 **Bidder**	Remarks
b	For construction work (execution of the lighting work/ arrangements) 1. At office/ storage area 2. At the preassembly area 3. At the construction site/ area		Yes	
c	Providing the necessary consumables like bulbs, switches, etc. during the course of project work		Yes	
d	Lighting for the living purposes of the bidder at the colony/ quarters		Yes	
3.5	**COMMUNICATION FACILITIES FOR SITE OPERATIONS OF THE BIDDER**			
a	Telephone, fax, internet, intranet, e-mail etc.		Yes	
3.6	**COMPRESSED AIR** wherever required for the work.		**YES**	
a	Supply of Compressor and all other equipments required for compressor & compressed air system including pipes, valves, storage systems etc		Yes	
b	Installation of above system and operation & maintenance of the same		Yes	
c	Supply of the all the consumables for the above system during the contract period		Yes	
3.7	**Demobilization of all the above facilities**		**Yes**	
3.8	**TRANSPORTATION**			
a	For site personnel of the bidder		Yes	
b	For bidder's equipment and consumables (T&P, Consumables etc.)		Yes	

S. No.	Description **Part - II**	Scope/ to be taken care by **BHEL**	 **Bidder**	Remarks
	3.9.0 ERECTION FACILITIES			

S. No.	Description Part - II 3.9.0 ERECTION FACILITIES	Scope/ to be taken care by BHEL	 Bidder	Remarks
3.9.1	Engineering works for construction:	Yes		NOT APPLICABLE
a	Providing the erection/ constructions drawings for all the equipment covered under this scope	Yes		
b	Drawings for construction methods	Yes	Yes	In consultation with BHEL
c	As-built drawings – where ever deviations observed and executed and also based on the decisions taken at site- example – routing of small bore pipes		Yes	Changes are to be marked in drawing & handover to BHEL on completion of work.
d	Shipping lists etc. for reference and planning the activities	Yes		NOT APPLICABLE
e	Preparation of site erection schedules and other input requirements		Yes	In consultation with BHEL
f	Review of performance and revision of site erection schedules in order to achieve the end dates and other commitments	Yes	Yes	In consultation with BHEL
g	Weekly erection schedules based on S. No. e		Yes	In consultation with BHEL
h	Daily erection/ work plan based on S. No. g		Yes	In consultation with BHEL
i	Periodic visit of the senior official of the bidder to site to review the progress so that work is completed as per schedule. It is suggested this review by the senior official of the bidder should be done once in every two months.		Yes	
j	Preparation of preassembly bay		Yes	NOT APPLICABLE
k	Laying of racks for gantry crane if provided by BHEL or brought by the contractor/ bidder himself		Yes	NOT APPLICABLE
l	Arranging the materials required for preassembly		Yes	NOT APPLICABLE
m	COIVD-19 Preventive Measure		Yes	

3.10 ELECTRICITY

3.10.1 The construction power (415V) will be provided at a single point for construction purpose only on chargeable basis. Further distribution is to be arranged by the bidder at his cost. Construction power shall be provided from the nearest Substation/ tapping point at a distance of approx. 1000m from site. The distance is only estimated; it may vary up to an extent depending on site condition.

3.10.2 Any duty, deposit involved in getting the Electricity shall be borne by the bidder. As regards to contractor's office shed also, all such expenditure shall be borne by the contractor.

3.10.3 Provision of distribution of electrical power from the given single central common point to the required places with proper distribution boards, approved cables and cable laying including supply of all materials like cables, switch boards, pipes etc., observing the safety rules laid down by electrical authority of the State/ BHEL/ their customer with appropriate statutory requirements shall be the responsibility of the tenderer/ contractor.

3.10.4 BHEL is not responsible for any loss or damage to the contractor's equipment as a result of variations in voltage/ frequency or interruptions in power supply.

3.10.5 Necessary "Capacitor Banks" to improve the Power factor as directed by PVUNL shall be provided by the contractor at his cost. Penalty if any levied by customer on this account will be recovered from contractor's bills.

3.10.6 The required energy meter for measuring power consumption shall be arranged by the contractor and taken care by the contractor.

3.10.7 Contractor has to make his own arrangements for his electricity requirement for his labour colony at his cost.

3.10.8 As there are bound to be interruptions in regular power supply, power cut/ load shedding in any construction sites, contractor should make his own arrangement for alternative source of power supply through deployment of adequate number of DG sets at their cost during the power breakdown/ failure to get urgent and important work to go on without interruptions. No separate payment shall be made for this contingency.

3.11 CONSTRUCTION WATER

3.11.1 Water (Raw water) required for construction purposes will be provided at one single point within the plant area on chargeable basis. The further distribution is to be arranged by the bidder at his cost. Construction water shall be provided at a distance of 1000m from site. Distance is only estimated, it may vary up to an extent depending on site condition.

3.11.2 The required water meter for measuring the consumption shall be provided and installed by the contractor. The required pumps & accessories, pipes for drawing water from the points and further distribution will be arranged by the contractor at their cost. BHEL is not responsible for any loss or damage to the contractor's equipment due to any reason. Any dispute regarding water consumption and distribution, the BHEL engineer decision will be final and binding.

3.11.3 The water charges may vary from time to time as per PVUNL prevailing charges, any dispute regarding consumption, the BHEL engineer decision will be final. In case of non-availability of water, the contractor shall make his own arrangements of water suitable for construction to have uninterrupted work. No separate payment shall be made for any contingency arrangement made by contractor, due to delay/ failure for providing water supply. Contractor has to make his own arrangements for his water requirement for his labour colony at his cost.

3.11.4 In case of non-availability of water, the contractor shall make his own arrangements of water suitable for construction purpose to have uninterrupted work. No separate payment shall be made for any contingency arrangement made by contractor, due to delay/ failure for providing water supply. Contractor has to make his own arrangements for his water requirement for his labour colony at his cost.

3.12 DRINKING WATER

Bidder shall provide drinking water at the work spot at their cost.

3.13 LIGHTING FACILITY

Adequate lighting facilities such as flood lamps, hand lamps and area lighting shall be arranged by the contractor at the site of construction, pre assembly yard and contractor's material storage area etc. at his cost.

3.14 OTHER FACILITIES

3.14.1 Adequate water less urinals shall be arranged by the contractor within quoted rates, at site of construction at different level and different areas like boiler structure, with proper disposal arrangement.

3.14.2 Vendors have to comply requirements of HSE & Statutory requirement in line with BHEL HSE plan, PVUNL Safety requirement, Jharkhand/ Central statutory requirement.

3.14.3 Vendors have to arrange labour rest sheds, drinking water facility, toilets, canteen facility as per local labour act/ BOCW act. Maintaining hygiene and disposal of debris, scraps, canteen items and area cleaning is included in vendor's scope.

3.14.4 Agency has to arrange trained scaffolding experts with accreditation from statutory agencies with proper experience and they will issue fitness certificates for safe use. Such kind of qualified scaffolding experts will vary as per job requirement. At the same time, training has to be given by these experts at regular intervals for their own workers for increasing no. of experts.

3.14.5 Agencies HSE officers should have sufficient experience as per rule 209 of BOCW act central rule 1998. Agencies HSE officers will be part of BHEL HSE Team and they will be responsible for giving training on HSE issues in addition to normal field works and other normal site requirements.

3.14.6 Preparation of method statement, HIRA, Job Safety analysis, permit to work, Lifting plans, and all supporting documents as required for starting & continuation of work/ job is in vendor's scope.

3.14.7 Hydras are not allowed for materials transport, only pick and carry cranes shall be deployed by the agency.

3.14.8 First aid centre will be maintained by BHEL and cost will be proportionately recovered from vendors.

3.14.9 Vendor has to arrange land within his quoted rate for making labour colony. Vendors labour colony has to be maintained with proper hygiene, drinking water, bathroom water, lighting arrangement, sewerage system. These facilities are to be regularly maintained including drains, surrounding, upkeep of labour colony. BHEL/ PVUNL & local statutory authorities will visit labour colony from time to time and all healthy conditions are to be maintained by vendor.

3.14.10 Scaffolding pipes, clamps, safety nets, floor grills for working platforms are to be made of good quality with proper certifications as per IS Codes.

3.15 DEWATERING:

Contractor shall ensure at all times that the work area & approach/ access roads are free from accumulation of water, so that the materials are safe and the erection/ progress schedule are not affected. No separate claim in this regard shall be admitted by BHEL.

3.16 LAND FOR SITE OFFICE

3.16.1 To establish a temporary site office, fabrication yard and storage area at the job site, open space will be provided free of charges. Contractor has to make his own arrangements for labour colony.

3.16.2 BHEL shall not provide to the contractor any residential accommodation to any of his staff and the contractor has to make his own arrangements.

3.16.3 Contractor has to furnish along with their offer, the details of requirements of area of space for his temporary site office, stores / storage shed.

3.16.4 Location and area requirement for office / storage sheds / fabrication yard shall be discussed and mutually agreed to.

3.17 SITE ORGANISATION

3.17.1 The contractor shall provide adequate staffing in the following areas in addition to the staffing requirements of execution as instructed/ informed by BHEL:

a) Overall planning, monitoring & control.
b) Quality control and quality assurance.
c) Materials management.

d) Safety, fire & security.

e) Industrial relations and fulfilment of labour laws and other statutory obligations.

3.17.2 The contractor shall maintain a site organization of adequate strength in respect of manpower, construction machinery and other implements at all times for smooth execution of the contract. This organization shall be reinforced from time to time, as required to make up for slippage from the schedule without any commercial implication to BHEL. The site organization shall be headed by a competent construction manager having sufficient authority to take decisions at site.

The contractor should also submit to BHEL for approval a list of construction equipment, erection tools, tackle etc. prior to commencement of site activities. These tools & tackles shall not be removed from site without written permission of BHEL.

4. T&Ps and MMEs TO BE DEPLOYED BY CONTRACTOR

List of major testing & measuring equipment/ tools and tackles to be arranged/ brought by contractor.

S. No.	Description	UoM	Qty
1	Capacitance & Tan Delta Kit		As per rqmt
2	Capacitance Meter having range of 20 pF –100MF +/ - 1%	Nos.	1
3	CFB & ZFB kit or equivalent for testing of Relay & Distance Protection	Nos. Each	1
4	Container for Transformer Oil Sampling	Nos.	As per rqmt
5	DC power supply 0-250 V, 10 A make "Aplab" or equivalent (variable source)	Nos.	6
6	DC Resistance Meter (μΩ Meter)	Nos.	1
7	DC shunt 400 A 75 mV	Nos.	3
8	Dead weight tester rated 400 kg/ cm^2 and with weights and test gauge facility. Make 'Budenberg' or 'Ravika'	Nos.	2
9	Decade resistance box	Sets	6
10	Digital Tong Tester 0-1/ 5 A AC	Nos.	1
11	Digital Tong tester AC 5/ 10 and 25/ 60/ 300 A of reputed make	Nos. Each	2
12	Digital Tong tester DC 30/ 60/ 300 A	Nos.	2
13	Equipment and consumables for LPI/ MPI test on impulse pipes	Sets	2
14	Ferrule printing machine	Nos.	2
15	Fire proof tarpaulin		As per rqmt
16	Frequency source 45 to 55 Hz with 110V	Nos.	1
17	Function Generator	Nos.	2
18	Glass thermometer 0-120 °C, 0-200 °C and 0-600 °C	Nos. Each	2
19	HV Test Kit AC: 0 –20 kV & DC: 0- 25 kV Preferably with dry type transformer	Nos. Each	As per rqmt
20	Inclined manometer (+/ -) 300 mm water column	Nos.	2
21	Industrial type vacuum cleaner	Nos.	2
22	Insulation Tester Hand Operated 250V/ 500V/ 1000V rated mains/ battery operated	Nos.	2
23	Insulation Tester Mains Operated 2500/ 5000V	Nos.	1
24	Insulation Tester Motorised Operated/ Electronic with selective range of 500/ 1000/ 2500/ 5000 V. Range 0.5 MΩ to 10000 MΩ	Nos.	3
25	Manometers (+/ -) 500 mm mercury column with hand bulb for lab and small manometer for field purpose.	Nos.	2

26	Meters for time measurement of breaker opening & closing time	Nos.	1
27	Micro Ohm meter/ Ducter(mV Volt Drop Test Kit) 0-200 A DC, 0-2000 μΩ with suitable calibrated cable leads for current injection & mv drop	Nos.	1
28	Muffle furnace – 800 °C with standard temperature gauges	Nos.	2
29	Multimeters		
	A) Digital, 3 1/ 2 digit Motwane/ HIL/ Fluke	Nos.	16
	B) Analog: Motwane make	Nos.	10
	C) Digital, 4 1/ 2 digit Motwane/ HIL/ Fluke	Nos.	10
30	Oil specific gravity and PPM measuring instrument	Nos.	1
31	Oil temperature bath suitable to calibrate the instruments range 0 – 200 °C with standard temperature gauges and thermostatic control	Nos.	4
32	Oscilloscope 100MHz	Nos.	1
33	Other Protective Devices		As per rqmt
34	Phantom Load Test Kit		As per rqmt
35	Phase Sequence Indicator	Nos.	2
36	Polarity Test Kit	Nos.	1
37	Portable air compressor with drier and regulator make "Toshniwal/ Khosla" rated for 7 to 10 kg/ cm^2	Nos.	7
38	PPM Tester for Transformer Oil	Nos.	1
39	Primary Injection Kit with pair of leads & clamps for testing CTS	Sets	1
40	Protective Earth rod suitable for 220/ 400 kV System having leakage current meter, 70 sq. mm. cable & clamps (reputed make)	Nos.	2
41	Relay Testing Kit	Nos.	1
42	Rheostat	Nos.	3
43	RTD/ Pt 100 source	Nos.	4
44	Secondary current injection kit up to 300 A	Nos.	As per rqmt
45	Secondary injection Kit 7500 A	Nos.	As per rqmt
46	Secondary Injection kit with integral timer for relay testing with cable leads & Banna plugs selective range 5A & 1A (Range for relay setting))	Set	As per rqmt
47	Silicon Oil Filter Machine for HVR	Nos.	1
48	Mineral Oil Filter Machine for HVR	Nos.	1
49	Single Phase Variac 250 V, 8 A	Nos.	2
50	Single Phase Variac 250V, 28 A	Nos.	2
51	Soldering iron "Soldron" make 25 W	Nos.	11
52	Standard gauges 12" dial size make "Budenberg" or "H Guru" or "Odin"		

	A) –1– 0 kg/ cm^2 pressure gauge(vacuum gauge)	Nos.	2
	B) 0 – 5 or 6 kg/ cm^2 pressure gauge	Nos.	2
	C) 0 – 10 kg/ cm^2 pressure gauge	Nos.	2
	D) 0 – 25 kg/ cm^2 pressure gauge	Nos.	2
	E) 0 – 60 kg/ cm^2 pressure gauge	Nos.	2
	F) 0 – 100 kg/ cm^2 pressure gauge	Nos.	2
	G) 0 – 250 kg/ cm^2 pressure gauge	Nos.	2
	H) 0 – 600 kg/ cm^2 pressure gauge	Nos.	2
	I) 0.2 to 1 kg pressure gauge	Nos.	2
53	Standard milliamps/ millivolts source of reputed make. Range 0 to 60 mA and 0 to 100 mV	Nos.	6
54	Stop Watch	Nos.	2
55	Tachometer (Non-Contact Type) (0-4000 rpm)	Nos.	3
56	Teletalk 2 wire system/ Group Mobile	Sets	28
57	Temperature Gun Digital Type	Nos.	1
58	Three Phase Shifter	Nos.	1
59	Three Phase Variac 05 A	Nos.	2
60	Three Phase Variac 15 A	Nos.	2
61	Transformer oil BDV test kit 0-100kV with 2.5 mm air gap		As per rqmt
62	Transformer oil purification plant with vacuum pump for evacuation transformer along with accessories & hoses of 750/ 1000/ 6000 LPH		As per rqmt
63	Transformer turns Ratio test kit	Nos.	1
64	Two way intercom set with 50 to 100 m cable for checking the cables continuity	Sets	2
65	Wattmeter AC/ DC 0-125-250 V, 0-5-10 A	Nos.	1
66	Earth Resistance Tester	Nos.	1
67	NAS Filtration Machine as mentioned in BOQ	Nos.	As per rqmt

S. No.	Description	UoM	Qty
HANDLING EQUIPMENTS			
1	Chain pulley block/ turfer		As per rqmt
2	Cranes, trucks etc. for transportation and erection of equipment		As per rqmt
3	D-shackles		As per rqmt
4	Manila ropes		As per rqmt
5	Nylon Slings		As per rqmt
6	Steel wire ropes		As per rqmt
7	Turn buckles		As per rqmt
MAJOR T&Ps			
8	24V AC Transformer & Hand lamps	Nos.	10
9	Cable Rollers		As per rqmt
10	Chain Pulley Blocks 5/ 10 T	Nos. Each	1
11	Copper tube bender and cutter sizes 6mm, 8mm, 1/ 2", 1/ 4"	Nos. Each	2
12	Crimping tool up to all sizes of Cables under scope of work	Nos. Each	4
13	Die sets for threading up to 2" pipe.	Sets	3
14	Distribution boards with power cable complete as required		As per rqmt
15	Drilling machines 1/ 4", 1/ 2", 3/ 4" & 1"	Nos. Each	4
16	Dynamometers		As per rqmt
17	Electrician tool kit	Nos.	15
18	Electrode drying ovens		As per rqmt
19	Fire extinguishers (Type: as required)	Nos.	5
20	Fire proof tarpaulin		As per rqmt
21	Flood light fittings	Nos.	30
22	Grinding machine	Nos.	15
23	Hydraulic Crimping Tool for conductor/ shield wire		As per rqmt
24	Hydraulic Jacks 250T/ 100T Capacity		As per rqmt
25	Measuring instruments like Micrometres and Callipers	Sets Each	3
26	Mechanical tool kit for fitters	Nos.	15
27	TIG/ MIG Welding Machine with accessories air cool type	Sets	4
28	Painting brush		As per rqmt

29	Personal computer and accessories, Printer	Sets	1
30	Pipe bending machine – 2" size	Nos.	3
31	Safety belts and Safety helmets		As per rqmt
32	Shearing Machine		As per rqmt
33	Spirit level	Nos.	5
34	Tap sets for both BSP and MPT threads up to 1" each	Sets Each	4
35	Torque Wrench Set (Till 225Nm)	Nos. Each	2
36	Tuffer Capacity 15T	Nos.	4
37	Welding Generators	Nos.	12
38	Welding Transformers	Nos.	12

The following materials/ consumables are to be arranged by the contractor as part of the contractual scope.

S. No.	Description
1	Welding electrodes for welding AS/ CS/ SS pipe and other welding from BHEL approved vendors only
2	Filler wire for argon welding
3	Argon, oxygen and acetylene gas
4	Provision for temporary scaffoldings.
5	GI "U" clamps with nuts and washers for impulse and GI pipe clamping.
6	Round aluminium tags (30mm dia. x 3mm thick)
7	Teflon tape and insulation tape.
8	Hold tight/ bitumen tape for GI pipe coupling.
9	Required paints and primer from BHEL approved vendors only.
10	Solder wire (60/ 40)
11	Protocol/ calibration report sheets as per BHEL format.
12	Panel/ JB sealing compound material (for cable entry from bottom/ top of panel).
13	PVC cable tie, aluminium strip and hardware for clamping of cables, copper tube, and temperature gauge capillary.
14	Copper lugs up to 4 sq. mm, PVC sleeve of different size, PVC button & tape
15	Ferrules (PVC) and suitable for ferrule printing.

NOTE:

a) Instruments shown above are for the regular works only. However, separate sets of tools and instruments are to be arranged and provided to commissioning gang. If

contractor fails to arrange the testing instruments as listed above, BHEL site will arrange the instruments at the cost of contractor.

b) The list of instruments/ equipment to be brought by the contractor as shown above is only indicative. Any other instruments/ equipment are required for the execution of the work is to be necessarily arranged by the contractor. The testing/ calibration instruments which are used to be duly calibrated in the interval prescribed by BHEL engineer from the BHEL approved agencies. And test certificate to be furnished.

c) The testing/ calibration instruments which are used to be duly calibrated in the interval prescribed by BHEL Engineers from the reputed agencies decided by BHEL and test certificate to be furnished. Contractor to submit calibration report from recognized agency prior to deployment of same at site and periodical calibration of the same to be arranged by contractor as per procedure of BHEL.

d) This above list is only indicative and neither exhaustive nor limiting. Contractor shall deploy all necessary T&P to meet the schedules & as prescribed by BHEL engineer and required for completion of work.

e) Other than the aforesaid, one computer, printer and other necessary peripherals will have to be maintained by the contractor in his site office as mentioned in Scope of Work.

5. LIST OF T&P TO BE PROVIDED BY BHEL FREE OF HIRE CHARGES ON SHARING BASIS:

S. No.	DESCRIPTION & CAPACITY OF T&P	QTY	PURPOSE
01	EOT crane in TG Hall (265/ 25 MT) without Operator.	2Nos.	For handling and erection within TG hall on sharing basis as available and subject to their accessibility and approachability.

Above T&P will be provided on sharing basis only. Contractor has to plan his activities well in advance and inform BHEL Engineer in charge/ Construction Manager the date of actual use. The decision of BHEL Engineer in-charge/ CM on this will be final and binding.

6. TIME SCHEDULE & MOBILIZATION

6.1 INITIAL MOBILIZATION

After receipt of fax/ Email LOI, Contractor shall discuss with Project Manager/ Construction Manager regarding initial mobilization. Contractor shall reach site, make his site establishment and be ready to commence the erection work within two weeks from the date of issue of Letter of Intent or as per the directions of Construction Manager/ Project Manager of BHEL. Such resources shall be progressively augmented to match the schedule of milestones and commissioning.

6.2 COMMENCEMENT OF CONTRACT PERIOD AND TENTATIVE SCHEDULE

Based on the availability of civil foundations from BHEL and materials from manufacturing units, contractor may have to advance the start of erection after getting clearance from Construction Manager, or the start of erection may get delayed due to site condition.

The contractor has to subsequently augment his resources in such a manner that following major milestones of erection & commission are achieved on specified schedules:

S. No.	MAJOR MILESTONE	Unit-1
1	START OF ACTIVITIES	OCT-2021
2	BOILER HYDRAULIC TEST	MAR-2022
3	BOILER LIGHT UP & ALKALI BOIL OUT	SEPT-2022
4	SYNCHRONIZATION	FEB-2023
5	COAL FIRING & FULL LOAD	FEB-2023
6	CAPACITY ADDITION	MAR-2023
7	LIQUIDATION OF PENDING POINTS	APR-2023
8	COMPLETION OF FACILITIES	MAY-2023

NOTE: Above time schedule is tentative and in order to meet above schedule in general, and any other intermediate targets set, to meet customer/ project schedule, contractor shall arrange & augment all necessary resources from time to time as per the instructions of BHEL.

6.3 CONTRACT PERIOD

6.3.1 The total contract period for completion of entire work will be 21 (Twenty-one) months from the date of start of Erection of the first major equipment. Erection, Testing, Calibration and Commissioning of permanent equipment required for completion of system shall be completed within the time schedule given above.

6.3.2 The contract shall commence from the date of deployment of contractor's T&P, proper site setup and erection of first equipment. All the above three conditions are to be fulfilled (certified by BHEL Engineer) for deciding the date of commencement of the contract.

6.3.3 The contractor shall complete all the work in the scope of this contract within the contract period.

6.3.4 Subject to availability of materials and other inputs, it is the responsibility of the contractor to carry out work to achieve the monthly progress and keep up the schedules.

6.3.5 Contractor shall draw the monthly erection program along with BHEL Engineer indicating the work to be achieved and event to be completed. Once the program is drawn, he shall adhere to the same. Contractor shall plan and erect the materials as it is received at site. The monthly planned percentage shall take into consideration the material available at site before the start of the month and also any material received during the month. Contractor shall mobilize his resources required to achieve the monthly programs.

6.3.6 Contractor shall specifically note that there is likely to be some delay in supplies of materials/ release of work fronts/ other reasons. Contractor shall have to work round the clock on such critical activities as a part of catch up program to meet the project requirement to the extent possible and shall also provide required resources as part of scope of work.

6.3.7 In order to meet above schedule in general, and any other intermediate targets set, to meet customer/ project schedule, contractor shall arrange & augment all necessary resources from time to time as per the instructions of BHEL.

6.3.8 In case the activities in the schedule are to be advanced, the related structural activities in the scope of the contractor are to be advanced to meet the project requirement. No extra payment whatsoever shall be paid on this account.

6.3.9 The contractor shall submit area-wise L3 schedule within 7 days in consultation with BHEL. The detailed L3 schedule shall be approved by BHEL and same shall be implemented. Bidder shall submit L3 schedule in MS Projects to meet the agreed project schedule covering various mile stone activities and their split up details such as mobilization, procurement of materials, fabrication & erection activities. This schedule shall also clearly indicate the interface facilities/ inputs applicable in each package.

6.4 DEFINITION OF WORK COMPLETION

The contractor's scope of work under these specifications will be deemed to have been completed in all respect, only when all the activities are completed satisfactorily and so certified by BHEL site in charge. The decision of BHEL in this regard shall be final and binding on the contractor.

6.5 MATERIAL RE-CONCILIATION & SHORT CLOSURE OF CONTRACT

The BOQ is for one unit and common areas. The contractor shall do unit-wise material re-conciliation periodically. In extreme case if need arises, BHEL may short close the contract unit-wise.

6.6 PERFORMANCE GUARANTEE FOR WORKMANSHIP (Clause no 2.24 of GCC)

Guarantee Period for entire contract shall commence from the "Work Completion Date" certified by BHEL Engineer.

6.7 SCHEDULE COMPRESSION

BHEL, owing to its commitment to their customer, may ask contractor to compress the total completion schedule by up to 15%. This will result in advancement of various milestones. For achieving the same, contractor shall plan his activities and mobilize additional resources accordingly to the satisfaction of BHEL engineer within the quoted rates.

6.8 PROVISION OF PENALTY IN CASE OF SLIPPAGE OF INTERMEDIATE MILESTONES

In case of slippage of Two Major Intermediate Milestones, mentioned as M1 & M2 hereunder, Delay Analysis shall be carried out on achievement of each of these two Intermediate Milestones in reference to F-14.

Milestones	Activities	To be completed by
M1	BOILER LIGHT UP & ALKALI BOIL OUT	SEPT-2022
M2	SYNCHRONIZATION	FEB-2023

Note 1:

Refer Clause No. 5 of IMPORTANT INFORMATION of the NIT regarding modalities against provision of penalty in case of slippage of Intermediate Milestones.

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7. TERMS OF PAYMENT

The progressive payment for erection, testing and commissioning on accepted price of contract value for Electrical Package rates will be released as per the break up given hereinafter:

TERMS OF PAYMENT FOR ELECTRICAL WORKS		
S. No.	**Activity/ Work Description**	**%age of Unit Rate**
E	**PRO RATA PAYMENTS (85%)**	
1.0	**Cable tray and accessories**	
1.1	Fabrication and fixing/ welding/ bolting in position	60%
1.2	Earthing of cable trays	10%
1.3	Tagging of cable trays (including touch up painting & cable tray numbering on sides)	8%
1.4	Covering of trays where ever envisaged	7%
	Total =	**85%**
2.0	**Cable laying including Earth wires**	
2.1	Laying of cables/ wires	45%
2.2	Glanding, Termination and tagging of cables (Except HT Termination)	15%
2.3	Dressing and clamping of cables	15%
2.4	Testing and charging of cables	10%
	Total =	**85%**
3.0	**Junction box/ Push button station (local)**	
3.1	Erection including fixing of terminal blocks where ever applicable	75%
3.2	Name plate fixing where ever applicable, Labelling (both inside and outside) and Commissioning of connected equipment	10%
	Total =	**85%**
4.0	**Miscellaneous Structural steel including frames for Panels/ Racks/ Instruments, supports for cable tray/ pipes/ tubes, Canopies etc.**	
4.1	Fabrication/ Pre assembly	45%
4.2	Erection, Alignment, welding/ bolting and if applicable chipping/ grouting/ painting	40%
	Total =	**85%**
5.0	**DG sets/ Switch Gears/ MCC/ PCC/ Distribution Boards/ Marshalling Box/ Starter Units/ Dry Transformers/ Electrical Hoists/ Panels/ Cubicles/ Desks/ UPS/ Batteries/ Chargers/ VFD/ LA assy/ NGT/ NGR/ SP/ Miscellaneous Equipment/ etc.**	
5.1	Placement, Alignment and coupling/ interconnection where ever applicable, erection of associated accessories etc.	50%
5.2	Pre-commissioning checks and tests	10%
5.3	Charging, Loop testing and commissioning	15%
5.4	System commissioning	10%

	Total =	**85%**
6.0	**Earthing/ Lightning protection strips, Earthing pits**	
6.1	Fabrication, erection, alignment, welding/ bolting of earthing/ lightning protection strips; earth pits completion	60%
6.2	Testing/ commissioning	25%
	Total =	**85%**
7.0	**LT/ HT Bus Ducts**	
7.1	Pre assembly of Bus Ducts and accessories, erection, alignment, bolting/ welding etc. complete with supporting structure	50%
7.2	Pre commissioning checks	20%
7.3	Testing, Charging and Painting (as applicable)	15%
	Total =	**85%**
8.0	**Oil Filled Transformers (Generator, Station, UAT, Station Service etc.)**	
8.1	Placement on foundation and alignment	25%
8.2	Erection of associated auxiliaries/ assemblies, oil filling, etc.	25%
8.3	Dry out including oil filtration	15%
8.4	Pre-commissioning checks	10%
8.5	Testing, Charging and Painting (as applicable)	10%
	Total =	**85%**
9.0	**Testing/ Commissioning of Equipment (like motors, actuators, ESP transformer, misc. equipment, etc.) erected by other agencies**	
9.1	Local testing	40%
9.2	Remote testing, Loop testing, and commissioning	40%
9.3	System commissioning	5%
	Total =	**85%**
10.0	**Other Items**	
10.1	Rubber mats/ Display Boards/ Miscellaneous items/ etc. : on installation	85%
10.2	Specialized Commissioning Services - on pro rata basis.	85%
10.3	Civil Works – Pro-rata on completion of actual work.	85%
10.4	Termination, HT Termination, Straight through jointing etc. : on pro rata basis	85%

II	**STAGE/ MILESTONE PAYMENTS (15%)**	
1	Boiler Light-Up	1%
2	ABO	0%
3	Steam Blowing	1%
4	Safety Valve Floating	0%
5	Oil Flushing (TG)	0%
6	Barring Gear (TG)	0%
7	Rolling and Synchronisation (STG)	2%
8	Full Load	2%
9	Trial Operation of Unit	3%
10	Painting	1%
11	Area cleaning, temporary structures cutting/ removal and return of scrap	1%
12	Punch List points/ pending points liquidation	1%
13	Submission of 'As Built Drawings'	1%
14	Material Reconciliation	1%
15	Completion of Contractual Obligation	1%
	Total for Stage/ Milestone Payments (15%)	**15%**

The unit rates quoted by the bidder shall be firm for a variation of quantities limited to ±30% of total order value corresponding to BOQ of Main equipment supply as above till finalization of engineering details & BOQ.

8.0 TAXES, DUTIES, LEVIES (Rev 14 dated 09/10/2020)

1) All taxes excluding GST, GST Cess **& BOCW** Cess **but including, Royalties, fees, license, deposits, commission, any State or Central Levy and other charges whatsoever, if any, shall be borne by you and shall not be payable extra.**
2) Any increase of the taxes excluding GST, GST Cess & BOCW **Cess**, at any stage during execution including extension of the contract shall have to be borne by the contractor. Quoted/ accepted rates/ price shall be inclusive of all such requirements. Please note that since GST on output will be paid by BHEL separately as enumerated below, your quoted rates/ price should be after considering the Input Credit under GST law at your end.
3) **GST :**

   The successful bidder shall furnish proof of GST registration .GST along with Cess (as applicable) legally leviable & payable by the successful bidder as per GST Law, shall be paid by BHEL. Hence Bidder shall not include GST along with Cess (as applicable) in their quoted price.
4) GST charged in the Tax Invoice/Debit note by the contractor shall be released separately to the contractor only after contractor files the outward supply details in GSTR-1 on GSTN portal and input tax credit of such invoice is matched with corresponding details of outward supply of the contractor and has paid the GST at the time of filing the monthly return
5) E-invoicing under GST has been implemented with effect from 1st October 2020 for all the taxable persons having turnover more than the threshold limit in any preceding financial year from 2017-18 onwards. Therefore, for all the taxable persons falling under the purview of E-invoice, it is mandatory to mention a valid unique Invoice Reference No. (IRN) and QR code as generated from E-Invoicing portal of the Government for the purpose of issuing a valid Tax Invoice. Only an E-invoice issued in the manner prescribed under rule 48(4) of CGST Rules shall be treated as valid invoice for reimbursement of GST amount.

   If the successful Bidder is not falling under the purview of E-Invoicing then he has to submit a declaration in that respect along with relevant financial statements.
6) Bidder shall note that the GST Tax Invoice complying with GST Invoice Rules (Section 31 of GST Act & Rules referred there under) wherein the 'Bill To' details will as below:

   BHEL GSTN – As per **Annexure -1**

   NAME -- Bharat Heavy Electricals Limited

   ADDRESS – Site address

7) Bidder to immediately intimate on the day of removal of Goods (in case of any supply of goods) to BHEL along with all relevant details and a scanned copy of Tax Invoice to below email ids to enable BHEL to meet its GST related compliances :-
   Email id ---- to be intimated later on.
   In case of delay in submission of the abovementioned documents on the date of dispatch, BHEL may incur penalty /interest for not adhering to Invoicing Rules under GST Law. The same will be liable to be recovered from the successful bidder, if such delay is not attributable to BHEL.
8) In case of raising any Supplementary Tax Invoice (Debit / Credit Note) Bidder shall issue the same containing all the details as referred to in Section 34 read with Rule 53.
9) Bidder shall note that in case GST credit is delayed/ denied to BHEL due to delayed / non receipt of goods and /or tax invoice or expiry of the timeline prescribed in GST Law for availing such ITC, or any other reasons not attributable to BHEL, GST amount shall be recoverable from the vendor along with interest levied / leviable on BHEL, as the case may be.
10) Bidder shall upload the Invoices raised on BHEL in GSTR-1 within the prescribed time as given in the GST Act. Bidder shall note that in case of delay in declaring such invoice in your return and GST credit availed by BHEL is denied or reversed subsequently as per GST Law , GST amount paid by BHEL towards such ITC reversal as per GST law shall be recoverable from the bidder along with interest levied / leviable on BHEL.
11) Way Bill: Successful Bidder to arrange for way bill / e-waybill for any transfer of goods for the execution of the contract.

    The Bidder has to make their own arrangement at their cost for completing the formalities, if required, with Issuing Authorities, for bringing materials, plants & machinery at site for execution of the works under this contract, Road Permit/ Way Bill, if required, shall be arranged by the contractor and BHEL will not supply any Road Permit/ Way Bill for this purpose.
12) **New taxes and duties**:-Any New taxes & duties, if imposed subsequent to due date of offer submission as per NIT & TCN, by statutory authority during contract period including extension, if the same is not attributable to you, shall be reimbursed by BHEL on production of relevant supporting document to the satisfaction of BHEL. However, you shall obtain prior approval from BHEL before depositing new taxes and duties.
    Benefits and/or abolition of all existing taxes must be passed on to BHEL against new Taxes, if any, proposed to be introduced at a later date.
    In case any new tax/levy/duty etc. becomes applicable after the date of bidder's offer but before opening of the price bid, the bidder must convey its impact on his price

duly substantiated by documentary evidence in support of the same before opening of the price bids. Claim for any such impact after opening the price bid will not be considered by BHEL for reimbursement of tax or reassessment of offer.

13) For transportation work, bidder shall declare in his quotation whether he is registered under GST, if yes, whether he intends to claim GST on forward charge basis. In absence of this declaration, BHEL will proceed further with the assumption that bidder intends not to claim GST on forward charge basis. However, in case of GST registered transporter, the amount to the extent of goods and service tax will be retained till BHEL avails the credit of GST. Further, transporter shall issue tax invoice which inter alia includes gross weight of the consignment, name of the consigner and the consignee, registration number of vehicle in which the goods are transported, details of goods transported, details of place of origin and destination, GSTIN of the person liable for paying tax whether as consigner, consignee or goods transport agency, and also containing other information as mentioned under rule 46.

14) **TDS under Income Tax shall be deducted at prevailing rates on gross invoice value from the running bills unless exemption certificate from the appropriate authority/ authorities is furnished.**

15) **TDS under GST shall be deducted at prevailing rates on applicable value from the running bills.**

16) **TCS under Income Tax 1961 has been implemented with effect from 1st October 2020 for every seller having turnover more than threshold limit during financial year immediately preceding financial year in which the sale of goods is carried out, who receives any amount as consideration for sale of any goods of the value or aggregate of such value exceeding threshold limit other than export of goods or who is already covered under other provision of section 206C, collect from the buyer, TCS as per applicable rates of the sale consideration exceeding threshold limit subject to following conditions**

i. Buyer shall be as per clause (a) of section 206C- (1H)
ii. Seller shall be as per clause (b) of section 206C- (1H)
iii. No TCS is to be collected, if the seller is liable to collect TCS under other provision of section 206C or the buyer is liable to deduct TDS under any provision of the Act and has deducted such amount.

If Successful Bidder is falling under the purview of TCS then he has to submit a declaration in that respect along with relevant financial statements before the start of work or if bidder is falling under preview of TCS during the work in

progress then bidder is compulsorily required to submit relevant financial statement in the beginning of the respective FY.

For TCS claim, vendor has to submit relevant documents required as per Income Tax Act.

17) Refer Annexure – 2 for BOCW Act & Cess Act.

ANNEXURE-1

State wise GSTIN no.s of BHEL

Sl. No	Projects under state	GSTIN
1	Andhra Pradesh	37AAACB4146P7Z8
2	Bihar	10AAACB4146P1ZU
3	Chhattisgarh	22AAACB4146P1ZP
4	Gujarat	24AAACB4146P1ZL
5	Jharkhand	20AAACB4146P5ZP
6	Madhya Pradesh	23AAACB4146P1ZN
7	Maharashtra	27AAACB4146P1ZF
8	Orissa	21AAACB4146P1ZR
9	Telangana	36AAACB4146P1ZG

ANNEXURE-2

BOCW Act & Cess Act

Bidder may please note that the sub-contractor/bidder of BHEL engaging building or construction worker in connection with building or other construction work, are required to follow the procedures enumerated below:

1. It shall be the sole responsibility of the contractor as employer to ensure compliance of all the statutory obligations under the Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 and the Building and other Construction Workers' Welfare Cess Act, 1996 and the rules made thereunder.
2. It shall be sole responsibility of the contractor engaging Building Workers in connection with the building or other construction works in the capacity of employer to apply and obtain registration certificate specifying the scope of work under the relevant provisions of the Building and Other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 from the appropriate Authorities.
3. It shall be responsibility of the contractor to furnish a copy of such Registration Certificate within a period of one month from the date of commencement of Work.

4. It is responsibility of the contractor to register under the Building and other Construction Workers' Welfare Cess Act, 1996 and deposit the required Cess for the purposes of the Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 at such rate as the Central Government may , by notification in the Official Gazette, from time to time specify. However, before registering and deposit of Cess under the Building and other Construction Workers' Welfare Cess Act, 1996, the contractor will seek written prior approval from the Construction Manager.
5. It shall be sole responsibility of the contractor as employer to get registered every Building Worker, who is between the age of 18 to 60 years of age and who has been engaged in any building or other construction work for not less than ninety days during the preceding twelve months as Beneficiary under the Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996.
6. It shall be sole responsibility of the contractor as employer to maintain all the registers, records, notices and submit returns under the Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 and the Building and other Construction Workers' Welfare Cess Act, 1996 and the rules made thereunder.
7. It shall be sole responsibility of the contractor as employer to provide notice of poisoning or occupation notifiable diseases, to report of accident and dangerous occurrences to the concerned authorities under the Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 and the rules made thereunder and to make payment of all statutory payments & compensation under the Employees' Compensation Act, 1923.
8. It shall be the responsibility of the sub-contractor as employer to make payment/deposit of applicable cess amount on the extent of work involving building or construction workers engaged by the sub-contractor within a period of one month from the receipt of payment. It shall also be responsibility of the Contractor to furnish BHEL on monthly basis, Receipts/ Challans towards Deposit of the Cess under the Building and other Construction Workers' Welfare Cess Act, 1996 and the rules made thereunder along with following statistics :
   (i)Number of Building Workers employed during preceding one month.
   (ii) Number of Building workers registered as Beneficiary during preceding one month.
   (iii)Disbursement of Wages made to the Building Workers for preceding wage month.
   (iv) Remittance of Contribution of Beneficiaries made during the preceding month
9. BHEL shall reimburse the contractor the Cess amount deposited for the purposes of the Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 under the Building and other Construction Workers' Welfare Cess Act, 1996 and the rules made thereunder. However, BHEL shall not reimburse the Fee

paid towards the registration of establishment, fees paid towards registration of Beneficiaries and Contribution of Beneficiaries remitted.

10. It shall be responsibility of the Building Worker engaged by the Contractor and registered as a beneficiary under the Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 to contribute to the Fund at such rate per mensem as may be specified by the State government by notification in the Official Gazette. Where such beneficiary authorizes the contractor being his employer to deduct his contribution from his monthly wages and to remit the same, the contractor shall remit such contribution to the Building and other construction Workers' Welfare Board in such manner as may be directed by the Board , within the fifteen days from such deduction.
11. Bidders may please note that though the quoted price is exclusive of BOCW (which will be reimbursed by BHEL as per sub-clause 9 above) , however, If at any point of time during the contract period, non-compliance of the provisions of the Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 and the Building and other Construction Workers' Welfare Cess Act, 1996 and the rules made thereunder is observed, BHEL reserves the right to deduct the applicable cess (1%) on the contract value and penalty (if any, imposed by Cess Authorities) from the payables on account of non-compliance.
12. The contractor shall declare to undertake any liability or claim arising out of employment of building workers and shall indemnify BHEL from all consequences / liabilities / penalties in case of non-compliance of the provisions of the Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 and the Building and other Construction Workers' Welfare Cess Act, 1996 and the rules made thereunder.

9 SPECIFIC INCLUSIONS

9.1 Specific Inclusions for Electrical works:

9.1.1 Consumables/ items to be provided by BHEL free of charge

a) Metallic Cable glands.
b) Steel for fabrication.

9.1.2 Consumables/ items to be arranged by Bidder at his/ her own cost.

Paint, primer and consumables.

10. SPECIFIC EXCLUSIONS

10.1 EXCLUSIONS

The following are specific exclusions from this work.

a) Erection of dampers, valves, electrical actuators, pneumatic actuators.
b) Erection of ESP rectifier transformer, electrical heaters, rapping motors, mechanical interlock and ALI's.
c) Erection of HT/ LT motors and Hoists. (except those specified herein)
d) Erection, testing and commissioning of elevators and DG sets.
e) Generator Erection.

1. **NOTE: The aforesaid exclusions should not be construed as exhaustive. They are meant for general guideline. BHEL reserves the right to include or exclude any item which is required for completing the job as per rates indicated in rate schedule. Contractor should carry out all such jobs as per the instructions of BHEL Engineer.**.

8. TECHNICAL DETAILS OF ELECTRICAL WORKS

Details (wherever required) of items listed in the rate schedule

SPECIAL NOTE:

a) All the items in general are to be erected and commissioned by the contractor, unless specifically mentioned otherwise.

b) In such cases where systems are described with component quantities lump sum rates are to be quoted. No separate payment will be made for the component items of those systems, although these systems may have certain items for which separate unit rates are also available.

c) The dimensions and weights mentioned are only approximate. No extra claims will be entertained due to change in dimensions/ weight.

d) Work includes instrumentation work in main plant area as well as all the off-site/ BOP areas.

11.1 SECTION E3: ASSEMBLY OF JUCTION BOXES AND PUSH BUTTON MOUNTING FRAMES:

Galvanized members will be supplied. These are to be assembled as per drawings. Some frames are suitable for one side JB mounting and others are suitable for JB mounting on both sides. Rate quoted should include assembly and installation.

11.2 GENERAL INFORMATION

11.2.1 CONTACT PRESSURE

Following torque are normally recommended for various bolts.

BOLT SIZE	RECOMMENDED TORQUE	TORQUE SPANNER CAPTY.
M10	0.85 to 1.30 Nm (20-30 ft-lb)	0.85 to 1.3 Nm
M12	1.30 to 1.70 Nm (30-40 ft-lb)	0.85 to 4.3 Nm
M16	1.70 to 2.10 Nm (40–50 ft-lb)	0.85 to 4.3 Nm
M20	2.10 to 2.50 Nm (50–60 ft-lb)	0.85 to 4.3 Nm

Alternatively tightening the nut till Belleville washer becomes flats. Then unscrew the nut by 1/ 8th turn. Exact method and extent of tightening shall be done as per instructions of BHEL site engineer/ as per equipment supplier's recommendation.

Note: - Considering the layout of the bus ducts as mentioned above for interconnection between the transformer and Generator it is not possible to the

segregate the quantity of structural support materials for individual area, hence the total quantity is mentioned.
Flexible joints, seal off bushings, rubber bellows, CT and their wiring, conduits/ GI pipes breather tapping etc., are accessories and form a part of the system.

11.2.2 Recommendation for Welded Joints (For Enclosure, Box Conductor, Make Up Pieces, Shunt and Flexible Joint etc.)

TYPE OF WELDING	MIG/ TIG WELDING
Filler Wire	1.6 mm dia. (NG 21 with 5% silicon)
Angle	10 to 15 degree foreheads.
Cleaning	Degrease and scratch brush.
Current Setting	Depend on thickness.

11.3 TECHNICAL DETAILS OF GENERATOR TRANSFORMER

Generator Transformer with core, winding, tank, tank fittings, rollers, turrets, bushings, marshalling kiosk, wiring, radiator bank, conservator assembly, etc.

- RATING: HV:315MVA; LV:315MVA
- VOLTAGE RATIO: 27/ 420/ √3kV
- WINDING CONNECTION: HV: Star, LV: Delta (After 3-ph bank formation)
- NUMBER OF PHASES: 1
- FREQUENCY: 50Hz
- TYPE OF COOLING: ODAF
- TOTAL WEIGHT INCLUDING OIL: 270750kg (approximately)
- TOTAL QUANTITY OF OIL: 50000 Liters (approximately)

11.4 TECHNICAL DETAILS OF STATION TRANSFORMER

Station Transformer with core, winding, tank, tank fittings, rollers, turrets, bushings, marshalling kiosk, wiring, radiator bank, conservator assembly, etc.

- RATING: HV:144MVA; LV1 & LV2: 72MVA
- VOLTAGE RATIO: 400/ 11.5-11.5kV
- NUMBER OF PHASES: 3
- FREQUENCY: 50Hz
- TYPE OF COOLING: ONAN/ ONAF (60%/ 100%)
- TOTAL WEIGHT INCLUDING OIL: 236750kg (approximately)
- TOTAL QUANTITY OF OIL: 70300 Liters (approximately)

11.5 TECHNICAL DETAILS OF DG SETS

The details of DG mentioned in the price bid have been revised. Moreover, the scope only includes the testing and commissioning of DG set, hence the change in the parameters (mentioned below) does not affect the unit price.

- 1750 kVA, 3-phase, 415V Diesel Generator set with approx. weight 34 MT — 01 Nos.
- 2000kVA, 3-Phase, 415V Diesel Generator set. approx. overall weight 43Tons. — 02 Nos.

11.6 TECHNICAL DETAILS OF ISOLATED PHASE BUS DUCT

S. No.	ITEM DESCRIPTION	QUANTITY (MEASURABLE UOM)	Dimension
		U#1	L(mm)xB(mm)xH(mm)
1	IPBD MAIN Run (22250 A), 27 kV	210Meter (approx.)	Enclosure Size: 1600 mm o/ d, 8 tk.
			Conductor Size: 800 mm o/ d, 16 tk.
2	IPBD DELTA Run (13000 A), 27 kV	135Meter (approx.)	Enclosure Size: 1200 mm o/ d, 6.35 tk.
			Conductor Size: 450 mm o/ d, 15 tk.
3	IPBD Tap-Off Run (2800 A), 24 kV	110Meter (approx.)	Enclosure Size: 876 mm o/ d, 4.78 tk.
			Conductor Size: 2x203 channel box
4	SPVT Cubicle	1 SET (3no Boxes)	2500x900x2300 each box
5	NG Cubicle	1 SET	2200x1650x2100 each box
6	Support Structure for IPBD	50 Tons (approx.)	

This Chapter consists of Part A & Part B of Volume II "Price bid":

CONTENTS	
Description	Remarks
PART A: Instructions to the Bidders	Instructions
PART B: % weightage for amount of individual items of Schedule of quantity	Refer Latest Chapter-XII of Vol-IA TCC (BILL OF QUANTITIES AND % WEIGHTAGE OF INDIVIDUAL ITEMS)
PART C: Total Lump Sum Price for entire scope of Work	This part is implanted in the E-Procurement portal entitled as "Part-C of Vol-II Price Bid".

Part A: Instructions to the Bidders

1. **Bidders shall quote Total Lump-sum Price for the entire scope of work at the excel sheet provided in the E-Procurement Portal titled as "Part-C of Vol-II Price Bid".** Price mentioned elsewhere in the offer of the bidder shall be treated as Null and Void.

2. BHEL has fixed the % weightages as in "Part-B" for the amount of individual items of Schedule of Quantity w.r.t. the total price of Price Bid Vol-II.

3. Based on the pre-fixed % weightages, amount of individual items shall be derived by BHEL. This amount shall not be rounded off.

4. Based on the quantities of individual item and the amount arrived in Sl No 3 above, item rate of individual items shall be derived by BHEL. This item rate shall be rounded off up to two decimal places and shall be used to calculate the total amount of an item.

5. For the convenience of bidders, BHEL has issued an excel sheet (file titled as Excel Sheet for Calculation Purpose only-2474) with all requisite formulae as detailed above. ***However this excel sheet shall not form part of contract document. Further, this sheet should not be uploaded at the e-Portal.***

6. Bidders to note that this is an '**Item rate contract'**. Payment shall be made for the actual quantities of work executed at the Unit rate arrived at as per serial no 4 above.

PART B: % weightage for amount of individual items of Schedule of quantity w.r.t. the total price (as quoted by the bidder in "Part C of Vol-II-Price Bid")

Note: This Chapter-XI is uploaded separately as file titled '**Chapter XII-BOQ and Percentage Weightage'-2474.**