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NOTICE INVITING TENDER

(Document No PS:MSX:NIT)

Bharat Heavy Electricals Limited

Ref: BHEL/NR/SCT/OBRA R&M /TG -13/1115

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NOTICE INVITING E-TENDER (NIT)
BIDDER TO SUBMIT OFFERS ON PORTAL
https://bhel.abcprocure.com

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To

Dear Sir/Madam

Sub : NOTICE INVITING E-TENDER

Sealed offers in two part bid system are invited from reputed & experienced bidders (meeting PRE QUALIFICATION CRITERIA as mentioned in Annexure-I) 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. **Salient Features of NIT**

SL NO	ISSUE	DESCRIPTION	
i	**TENDER NUMBER**	**BHEL/NR/SCT/OBRA R&M /TG -13/1115**	
ii	**Broad Scope of job**	**R&M, TESTING, COMMISSIONING, TRIAL OPERATION & HANDING OVER OF TURBINE GENERATOR & AUXILIARIES OF UNIT NO. 13 AT 5X200 MW OTPS OF UPRVUNL, OBRA.U.P.**	
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*
e	Volume-II	*Price Schedule (Absolute value).*	*Applicable*
iv	**Issue of Tender Documents**	**From BHEL website (www.bhel.com) and https://bhel.abcprocure.com** Tender documents will be available at website till due date of submission	*Applicable*
v	**DUE DATE & TIME OF OFFER SUBMISSION**	***Date : 01/08/2018, Time : 1500 HRS*** ***Place : on https://bhel.abcprocure.com***	*Applicable*
vi	**OPENING OF TENDER**	***At due date / time*** ***Date : 01/08/2018, Time : 1530 HRS*** *Notes:* *(1) In case the due date of opening of tender becomes a non-working day, then the due date & time of offer submission and opening of tenders get extended to the next working day.* *(2) Bidder may depute representative to witness the opening of tender.* ***However it being an e-tender it***	*Applicable*

		shall be opened online	
vii	**EMD AMOUNT**	*Rs. 3,40,000/-.*	***Applicable for all Bidders (including MSE Bidders)***
viii	**COST OF TENDER**	*Rs 2000/-.*	***Applicable for all Bidders (including MSE Bidders)***
ix	**LAST DATE FOR SEEKING CLARIFICATION**	***Five days before bid submission due date***. *Along with soft version also, addressing to contact address given below* *1) Name: **ADITTI GUPTA*** *Designation: SR. ENGINEER* *Deptt: SCT* *Address: BHEL-PSNR, PLOT NO. 25, SECTOR – 16A, NOIDA - 201301* *Phone: (Landline/Mobile) 0120 - 2416511* *Email : aditi@bhel.in* *2) Name:**V.K.GUPTA*** *Designation: AGM* *Deptt: SCT* *Address: BHEL-PSNR, PLOT NO. 25, SECTOR – 16A, NOIDA - 201301* *Phone: (Landline/Mobile) 0120-2416262* *Email : virender.gupta@bhel.in*	*Applicable*
x	**SCHEDULE OF Pre Bid Discussion (PBD)**		*Not applicable.*
xi	**INTEGRITY PACT & DETAILS OF INDEPENDENT EXTERNAL MONITOR (IEM)**		*Not 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 Corrigendums) & portal https://bhel.abcprocure.com **and not in the newspapers**. Bidders to keep themselves updated with all such information	
xiii	**Tender submission**	on portal https://bhel.abcprocure.com	

2. 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, **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. Unless specifically stated otherwise, bidder shall remit cost of tender and courier charges if applicable, in the form of Demand Draft drawn in favour of Bharat Heavy Electricals Ltd, payable at Power Sector Regional HQ at Noida issuing the Tender, along with techno-commercial offer. Bidder may also choose to deposit the Tender document cost by cash at the Cash Office as stated above against sl no iv of 1, on any working day; and in such case copy of Cash receipt is to be enclosed with the Techno Commercial offer. Sale of tender Documents shall not take place on National Holidays, holidays declared by Central or State Governments and BHEL PS HQ at Noida, Sundays and second/ last Saturdays.

As this tender is an E-Tender and no paper bids will be accepted therefore the scanned copy of the Demand Draft or the Cash Receipt issued by BHEL PSNR should be uploaded in the E procurement portal. Hard Copy of the demand draft should reach BHEL PSNR HQ Noida before the due date and time of bid submission. BHEL shall not be responsible for postal or any other delays in this regard.

4. Unless specifically stated otherwise, bidder shall deposit EMD through Cash Deposit (as permissible under the extant Income Tax Act) (before tender opening), Electronic Fund Transfer credited in BHEL account (before Tender Opening) or Banker's Cheque/ Demand Draft/ Pay Order in favour of Bharat Heavy Electricals Ltd, payable at Noida (along with offer).

'One Time EMD' will not be considered for this tender. All the bidders who have 'One Time EMD' with BHEL and want to participate in this tender, would also submit the requisite amount of EMD as mentioned in Clause No. 1, Salient Features of NIT, Sl. No. (vii) above.
However, the One Time EMD can be adjusted against the EMD applicable against this tender on specific request of bidder.

For Electronic Fund Transfer the details are as below-:

a) Name of the Beneficiary -: Bharat Heavy Electricals Limited

a) Bank Particulars

i).	Bank Name -:	STATE BANK OF INDIA
ii).	Bank Telephone No.(with STD code)-:	011-23475566
iii).	Branch Address-:	CAG II BRANCH, NEW DELHI 4th & 5th FLOOR, REDFORT CAPITAL, PARASNATH TOWERS, BHAI VEER SINGH MARG, GOLE MARKET, NEW DELHI-110001
iv).	Bank Fax No. (with STD code) -:	011-23475566
v).	Branch Code -:	17313
vi).	9 Digit MICR Code of the Bank Branch -:	110002562
vii).	Bank Account Number -:	10813608647
viii).	Bank Account Type -:	CASH CREDIT
ix).	11 Digit IFSC Code of Beneficiary Branch-:	SBIN00017313

(Note-: In case of E-Tenders, no paper bids shall be accepted, therefore, the scanned copy of the Banker's Cheque/ Demand Draft/ Pay Order/ Details of payment made through Electronic Fund Transfer should be uploaded in the E-Procurement Portal and hard copy of the same should reach BHEL-PSNR HQ Noida before the due date and time of bid submission. BHEL shall not be responsible for postal or any other delays in this regard.)

For other details please refer General Conditions of Contract.

5. **Procedure for Submission of Tenders**: This is an E-tender floated online through our E-Procurement Site ***https://bhel.abcprocure.com***. The bidder should respond by submitting their offer online only in our e-Procurement platform at ***https://bhel.abcprocure.com.*** Offers are invited in two-parts only.

Documents Comprising the e-Tender

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

a. Technical Tender (UN priced Tender)

All Technical details (eg. 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.** Tender Cost and Earnest money Deposit (EMD) furnished in accordance with NIT Clause 3.0 & 4.0.
- **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.
vi. In case offer is sent through hard copy/fax/telex/cable/electronically in place of e-tender, same shall not be considered.

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).

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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-:

M/s AbcProcure, Ahmedabad

A-202/208, Wall Street-II, Opp. Orient Club, Nr. Gujarat College,

Ellis Bridge, Ahmedabad-380006

The contact details of the service provider are given below:

Name	Contact Nos.	e-mail ID	Role	Location
Swapnil Hamilton	+91 79 40270549	swapnil.h@eptl.in	Support Executive	HO – Ahmedabad
Hardik Oza	+91 79 40270560	Hardik.oza@eptl.in	Support Executive	HO – Ahmedabad
Ankur Bhatt	+91 79 40270590	ankur.bhatt@eptl.in	Support Executive	HO – Ahmedabad
Prashant Rajyaguru	+91 79 40270545 / 9016859416	prashant@eptl.in	Ast. Manager – Implementation & Support	HO – Ahmedabad
Dharam Rathod	+91 79 40270596 / 9374519754	dharam@eptl.in	Manager – Implementation & Support	HO – Ahmedabad
Pradip Parmar	+91 79 40270532 / 9328657215	pradip@eptl.in	Sr Manager – Implementation & Support	HO – Ahmedabad
Devang Patel	+91 79 40270576 / 99983 05442	devang@eptl.in	Sr Manager – Implementation & Support	HO – Ahmedabad

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.

1. The contact details of the DSC Certifying Authority as given below

1	**GNFC**	www.ncodesolutions.com
2	**e-Mudhra**	http://www.e-Mudhra.com
3	**Safescrypt**	www.safescrypt.com

Vendors are also requested to go through seller manual available on ***https://bhel.abcprocure.com***.

6. **Not Used**

7. 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. 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. **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 -1))

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. $\mathbf{T_T} = T_1 + T_2 + T_3 + T_4 + \ldots T_N$)

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. $S_1 = S_{1\text{-}1} + S_{1\text{-}2} + S_{1\text{-}3} + S_{1\text{-}4} + S_{1\text{-}5} + \ldots S_{1\text{-}T1}$). 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 '$= S_1 + S_2 + S_3 + S_4 + S_5 + \ldots S_N$.)

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
d) 36 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). Others (Mechanical)

iii). Bidders who have not been evaluated for at least six package months in the last 36 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/LOA from BHEL.

The "FIRST TIMER" tag shall remain till completion of all the contracts against which vendors has been tagged as First Timer or availability of 6 evaluation scores within last 36 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). In the unlikely event of all bidders shortlisted against Technical and Financial Qualification criteria not meeting the criteria on 'Assessment of Capacity of Bidders' detailed above, OR leads to a single tender response on applying the criteria of 'Assessment of Capacity of Bidders' OR due to non-approval by Customer, then BHEL at its discretion reserves the right to consider the further processing of the Tender based on the **Overall Performance Rating** 'R_{BHEL}**'** only, starting from the upper band.

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 25th of Evaluation Month or 3 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 in CL 9 above is applicable to prime bidder and Consortium partner (or Technical tie up partner) for their respective scope of work.

10. 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. For any clarification on the tender document, the bidder may seek the same over 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. 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. 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. Unless specifically mentioned otherwise, bidder's quoted price shall deemed to be in compliance with tender including PBD.

15. 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 Clause No. 1, Salient Features of NIT, Sl. No. (xi) above.**

15a. **Integrity Pact (IP) – Not Applicable**

16. 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. In case BHEL decides on a `Public Opening', the date & time of opening of the PRICE BID shall be intimated to the qualified bidders and in such a case, bidder may depute one authorised 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. 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. (a) BHEL reserves the right to go for Reverse Auction (RA) (Guidelines as available on www.bhel.com) instead of opening the sealed envelope price bid, submitted by the bidder. This will be decided after techno-commercial evaluation. Bidders to give their acceptance with the offer for participation in RA. Non-acceptance to participate in RA may result in non-consideration of their bids, in case BHEL decides to go for RA.

(b) Those bidders who have given their acceptance to participate in Reverse Auction will have to necessarily submit 'Process compliance form' (to the designated service provider) as well as 'Online sealed bid' in the Reverse Auction. Non-submission of 'Process compliance form' or 'Online sealed bid' by the agreed bidder(s) will be considered as tampering of the tender process and will invite action by BHEL as per extant guidelines for suspension of business dealings with suppliers/ contractors (as available on www.bhel.com).

(c) The bidders have to necessarily submit online sealed bid less than or equal to their envelope sealed price bid already submitted to BHEL along with the offer. **The envelope sealed price bid of successful L1 bidder in RA, if conducted, shall also be opened after RA and the order will be placed on lower of the two bids (RA closing price & envelope sealed price) thus obtained. The bidder having submitted this offer specifically agrees to this condition and undertakes to execute the contract on thus awarded rates.**

(d) If it is found that L1 bidder has quoted higher in online sealed bid in comparison to envelope sealed bid for any item(s), the bidder will be issued a warning letter to this effect. However, if the same bidder again defaults on this count in any subsequent tender in the unit, it will be considered as fraud and will invite action by BHEL as per extant guidelines for suspension of business dealings with suppliers/ contractors (as available on www.bhel.com).

(e) If reverse auction process is unsuccessful, sealed envelope price bids of all the techno-commercially qualified bidders shall be opened and the tender shall be processed accordingly. However, the envelope sealed bid(s) of techno-commercially acceptable bidder(s) who had agreed to participate in the RA and had failed to submit the online sealed bid shall not be opened.

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

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

23. **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 with a validity period of six months initially. In case the consortium is awarded the contract, then the Consortium Agreement between the Prime Bidder and Consortium Partner or partners shall be extended till contractual completion period including extension periods if any applicable.

23.2 'Stand-alone' 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) shall be as specified in the PQR

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. 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 the prime Bidder withdraws, the whole contract shall be considered cancelled and short closed.

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 two similar works with the same consortium partner or partners under direct orders of BHEL, the Prime Bidder shall be eligible for becoming a 'stand alone' bidder for similar works, subject to certification from BHEL about the active involvement of the Prime Bidder for satisfactory execution of the works.

23.14 The consortium partner shall submit SD equivalent to 2% 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 1% of the total contract value in addition to the SD to be submitted by the prime Bidder for the total contract value.

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

26. It may please be noted that guidelines/rules in respect of Suspension of Business dealings', 'Vendor evaluation format', 'Quality, Safety & HSE guidelines', milestone/ completion certificate, etc may undergo change from time to time and the latest one shall be followed. The abridge version of extant 'Guidelines for suspension of business dealings with suppliers/ contractors' is available on www.bhel.com on "**supplier registration page**".

27.0 The offers of the bidders who are on the banned/ hold list as 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

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

27.1.1 **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.

27.1.2 **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.

28.0 **Micro and Small Enterprises (MSE) – Not Applicable**

29.0 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.

30.0 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

for BHARAT HEAVY ELECTRICALS LTD
(SCT)

Enclosure:-

(i) Annexure-1: Pre Qualifying criteria.
(ii) Annexure-2: Check List.
(iii) Annexure-3: Authorization of representative who will participate in the online Reverse Auction Process
(iv) Annexure-4: Feedback form
(v) Other Tender documents as per this NIT.

ANNEXURE - 1

PRE QUALIFYING REQUIREMENTS

JOB	**R&M, Testing, Commissioning, Trial operation & Handing over of Turbine Generator & auxiliaries of unit no. 13 at 5X200 MW OTPS of UPRVUNL, OBRA,U.P.**
TENDER NO.	BHEL/NR/SCT/OBRA R&M /TG -13/1115

Sr. No.	Name and Description of qualifying criteria	Bidders claim in respect of fulfilling the PQR Criteria
A	**Submission of Integrity Pact duly signed.**	Not Applicable
B	**Assessment of Capacity of Bidder to execute the work as as per clause 9.0 of NIT**	Applicable
C	**TECHNICAL CRITERIA**	Applicable
	Bidder who wish to participate should have 'Executed' works for any one of the following during last 7 years, ending on the "latest date of Bid Submission" of tender -:	
C-1	One STG job of ≥ 100 MW OR	
C-2	One GTG job of one unit of ≥ 190MW OR	
C-3	Boiler (Necessarily consisting of rotating machines) of one unit of ≥ 400 MW, under direct order of BHEL and experience of STG of ≥ 60 MW OR	
C-4	Boiler (Necessarily consisting of rotating machines) of one unit of ≥ 400 MW, under direct order of BHEL and Consortium arrangement with an agency who has experience of STG of ≥ 60 MW. OR	
C-5	Capital overhauling of one STG above 100 MW covering bearing inspection work and overhauling of all cylinders (HP, IP & LP) and generator.	
D	**FINANCIAL CRITERIA**	Applicable
D-1	**TURNOVER** Bidders must have achieved an average annual financial turnover (Audited) of **INR 51.00 Lakhs or more** over last three Financial Years (FY) i.e. (2014-2015, 2015-2016, 2016-2017). Bidders shall submit audited accounts (balance sheets and profit & loss account) in support of this. In case audited Financial statements have not been submitted for all the three years as indicated above, then the applicable audited statements submitted by the bidders against the requisite three years, will be averaged for three years i.e. total divided by three. 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.	

D-2	**NETWORTH** 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 'D-1' above. Net worth = Paid up share capital* + Reserves (* : Share Capital OR Partnership Capital OR Proprietor Capital as the case may be)	
D-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 'D-1' above. Note-: PROFIT shall be PBT earned during any one year of last three financial years as in 'D-1' above	
E	**APPROVAL OF CUSTOMER** Note: Names of bidders (including consortium/Technical Tie up partners in case of consortium bidding) who stand qualified after compliance of criteria A to D shall be forwarded to customer for their approval.	Applicable
F	**CONSORTIUM CRITERIA**	Applicable for sl. No. C-4 above. Conditions applicable as per sl. No. 23 above

Explanatory Notes for QR

1. For evaluation of PQR, the credentials of the bidder alone, and not that of the Group Company shall be considered.

2. For criteria 'C', 'Executed' means
   "BOILER LIGHT UP" in respect of Boiler.
   "SYNCHRONISATION" in respect of STG/GTG.
   The bidder should have achieved the above criteria, even if the total contract has not been completed or closed.

3. Boiler means HRSG or WHRB or any other types of Steam Generator.

4. 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.

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.

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:	
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 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	Declaration by Authorised Signatory	Applicable/~~Not Applicable~~	YES/NO
12	No Deviation Certificate	Applicable/~~Not Applicable~~	YES/NO
13	Declaration confirming knowledge about Site Conditions	Applicable/~~Not Applicable~~	YES/NO
14	Declaration for relation in BHEL	Applicable/~~Not Applicable~~	YES/NO
15	Non Disclosure Certificate	Applicable/~~Not Applicable~~	YES/NO
16	Bank Account Details for E-Payment	Applicable/~~Not Applicable~~	YES/NO
17	Capacity Evaluation of Bidder for current Tender	Applicable/~~Not Applicable~~	YES/NO
18	Tie Ups/Consortium Agreement are submitted as per format	Applicable/~~Not Applicable~~	YES/NO
19	Power of Attorney for Submission of Tender/Signing Contract Agreement	Applicable/Not Applicable	YES/NO
20	Analysis of Unit rates	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

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

1	NAME & DESIGNATION OF OFFICIAL	
2	POSTAL ADDRESS (COMPLETE)	
3	TELEPHONE NOS. (LAND LINE & MOBILE BOTH)	
4	FAX NO.	
5	E-MAIL ADDRESS	
6	NAME OF PLACE/ STATE/ COUNTRY, WHEREFROM S/HE WILL PARTICIPATE IN THE REVERSE AUCTION	

ANNEXURE – 4

Feedback Form: From where did you get information reg. this tender

1	NEWSPAPER ADVERTISEMENT (NAME)	
2	BHEL WEBISTE (TENDER NOTIFICATION)	
3	CENTRAL PUBLIC PROCUREMENT PORTAL OF GOVERNMENT OF INDIA (CPP PORTAL)	
4	EMAIL COMMUNICATION FROM BHEL	
5	ANY OTHER SOURCE	

Rev 01

1st June

2012

TECHNICAL CONDITION OF CONTRACT (TCC)

(Document No. PS: MSX:TCC)

BHARAT HEAVY ELECTRICALS LIMITED

FOR

R&M ,TESTING, COMMISSIONING, TRIAL OPERATION & HANDING OVER OF TURBINE GENERATOR & AUXILLIARIES OF UNIT NO.13 AT 5X200 MW, OTPS OF UPRVUNL OBRA.

PART-I OF TCC

Bharat Heavy Electricals Limited

(A Govt. of India Undertaking)

Power Sector –Northern Region,

Plot No. 25, Sector-16 A,

Distt. GautamBudh Nagar, Noida-201301

1.0	**Project information**	
Sl. No.	**Title**	**Description**
1.1	Name of the Owner	**Uttar Pradesh RajyaVidyutUtpadan Nigam Limited (UPRVUNL)**
1.2	Address	OBRA THERMAL POWER STATION OBRA SONEBHADRA (U.P.) 231219
1.3	Existing	Obra 'B' (5 X 200MW) Refurbishment
1.4	Nearest Railway station	Chopan – 15Km Approx. Mirzapur – 120Km Approx. Varanasi / Mugal Sarai – 125Km Approx.
1.5	Nearest City	Roberstganj / Sonebhadra
1.6	Nearest Airport	VARANASI (150 KM)
1.7	Highest Temperature	48 deg C
1.8	Lowest Temperature	2deg C

2.0	**TENTATIVE SCOPE OF WORK**	
2.0.1	**SCOPE OF WORK FOR DISMANTLING, ERECTION AND COMMISSIONING**	
	BHEL has been awarded Renovation & Modernization (R&M) work of 5x200 MW Sets at Obra Thermal Power Station OBRA, Distt. Sonebhadra by UPRVUN Limited. The Scope of work covered Dismantling the old equipment except ESP, repairs, servicing, replacement, erection, painting, testing, performance guarantee and commissioning of plant as envisaged and handing over of the units viz Boiler, Turbine, C&I, Generator Exciter, Balance of plants such as CW pump House, Switchgears, HT/LT motors etc. and ESPs (New replacement however, civil works of ESP shall be done by UPRVUNL) in respect of Refurbishment of overhauling, renovation, modernization and uprating of 5X200 MW Unit of Obra "B" Thermal Power Station. Detailed Scope of work is also enclosed	
2.1	Scope of work under this tender for R&M, etc i.e Dismantling, Erection,TESTING, COMMISSIONING, TRIAL OPERATION & HANDING OVER OF TURBINE GENERATOR & AUXILLIARIES OF UNIT NO.13 AT 5X200 MW, OTPS OF UPRVUNL OBRA. **Parties are advised to visit Obra TPS and understand the exact quantum work, condition of equipment & work required to be carried out before submission of offer.**	
S.NO.	**DESCRIPTION**	**% ALLOTED**
2.1	**MAIN TURBINE:**	**25**
2.1.1	Removal of insulation of turbine cylinders, ESV, IV, LP crosses over pipe etc and disposal of the scrap to scrap yard.	1.5
2.1.2	Removal of insulation from pipeline i.e. main stream, CRH, HRH, extraction line, gland seals, HP heaters, LP heaters, GSC1 & GSC2,de-aerator and as per requirement (damaged portion) including removal of insulation for installation of thermo-couples, Hanger Support & root valves and disposal of the scrap to scrap yard.	0.5
2.1.3	Dismantling of bearing pedestals, record reference readings, dismantling of turbine cylinders, ESVs, IVs, Servomotors, control valves, Governing Organs all the TG Auxiliaries including fasteners and valve liners etc. Cleaning of casing and internals etc.	2
2.1.4	Removal of valve seats of ESV, IV, HPCV, IPCV including fasteners and removal of HP, IP nozzle segments.	2
2.1.5	Replacement of Front bearing pedestal GUIDE KEY – 02 nos. (guide key mounted on Sole plate) including machining & matching, cleaning & lubricating by Molykote grease at sliding surface of FBP & MBP. Cleaning & greasing of all the palm keys of the HP, IP & LP cylinder.	2
2.1.6	Inspection of HP, IP & LP Casing by DPT/MPI for any defect, crack etc and in situ repair of the same as per BHEL's recommendation. P/P matching of	2

	HP/IP/LP including liner & gland box (build up of casing as per requirement).	
2.1.7	Replacement of all the bearing including DPT/UT & matching of bearing and pedestal covers. Replacement of HP, IP & LP Rotors and internals (nozzles diaphragms, Gland box. etc) with new ones & establishing best centre line of TG from MOP to Generator & maintaining catenary (Correction of seal bore by in site matching of bearing bore, if required during assembly). Matching of bearing & Preliminary alignment.	6
2.1.8	Replacement of all fasteners, pin bolt, dowel pin of HP, IP, LP Turbine.	0.5
2.1.9	Centring of HP, IP and LP Internals. Checking & adjustment of steam flow path, seal clearances axial & Radial, thermal clearances as per BHEL's norms.	2
2.1.10	Swing check of HP Rotor & correction as required before box up and after coupling. Trial box-up & Final box up of HP, IP & LP cylinders with required clearances, cold & hot tightening of parting plane. Pipe connections, bump check etc.	2
2.1.11	Final alignment & coupling including reaming, honing, machining and fitting of bush in coupling hole (LP/Gen.) as required and coupling of Rotors(HP/IP,IP/LP & LP/Gen.).	2
2.1.12	Setting of bearing clearances & interference, Setting of clearances of oil guards & box-up of bearing & pedestal.	0.5
2.1.13	Rotor placed on 'O' position, assistance during fitting of turbovisory instrument.	0.5
2.1.14	**BARRING GEAR** Overhauling/refurbishment of barring gear, replacement of gear wheels, bearings, revisioning /replacement of any other parts viz supply by BHEL M/u, alignment, setting of clearance etc.	0.5
	Note- **1. Shifting of old Turbine Rotors, diaphragms, gland boxes, Bearings, oil guards, valve seats, fasteners and worn out parts etc of TG & AUX to Stores as per BHEL instruction.** 2. **All machining work for fixing and shifting of diaphragms, liners, nozzles, gland boxes, Bearings, Oil guards, dowels pins, valve seat and liners & Guide/Fixed stud etc. (Reaming & honing to be carried for Fixed Stud and dowels pins of HPC) of HP, IP & LP turbine are included in contractor scope & shall be carried out by the agency without any extra cost.** 3. **UT, DPT MPI, Heat treatment & stress relieving as per BHEL norms including consumables & experts.**	1
2.2	**GENERATOR:**	**7**

2.2.1	Dismantling of generator, record all clearances/ reference readings.	1.5
2.2.2	➢ Inspection of Bushing including replacement of Gasket, bushing, HV test of Bushing. ➢ Inspection of bus duct & rectification as required.	0.5
2.2.3	➢ Wedge Deflection test of stator and rectification. ➢ HT of stator winding (manpower assistance) ➢ Purge test of rotor, Air leak test of rotor & replacement of CC bolts ➢ Replacement /servicing of gas coolers, including hydro test.	1
2.2.4	**Electrical testing of generator i.e. ELCID Test, Tan Delta Test, RSO Test, IR/PI, Impedance, DC Resistance etc. including deployment of Equipments & Experts.**	1.5
2.2.5	Gluing & varnishing, Rotor thread-in .Complete assembly of Generator, Replacement / servicing of seal liners, air tightness test, CO_2 and H_2 purging, setting of DP & Other pre commissioning & Post commissioning activities.	2.25
2.2.6	Dismantling of Brush Gear Assembly & restoration after assembly of Generator including cabling work.	0.25
2.3	**Generator Auxiliaries**	**2.5**
2.3.1	Complete overhauling including valves of generator oil, gas (H2 & CO2), water system, expansion tank and Damper Tank, AC & DC seal oil pumps. Servicing of stator water pumps, stator water cooling pumps & water coolers etc including repair/machining/ replacement and provision of spares & consumables like gaskets, gland packing's etc as required for servicing.	2.5
2.4	**Replacement of rotor heating & studs heating line**	**2**
2.4.1	Replacement of rotor heating line & studs heating line with motorized/manual Valves (complete system) of HPT & IPT as per BHEL drg. / Instructions. Position of valves to be shifted & make approach platform.	2
2.5	**Valves & Servomotor**	**5**
2.5.1	Replacement of valve Seat, valve spindle, liners & fasteners of HPCV's, IPCV's, ESV's & IV's.	2.5
2.5.2	Re visioning of Turbine extraction NRVs.	1
2.5.3	Overhauling of/ Refurbishment of MOP & Governing Organs., Revisioning of valves & servomotor, CVSM, & Cam distribution arrangement etc. Commissioning of valves as per BHEL norms.	1.5
2.6	**Installation of EHG Mechanical**	**1**
2.6.1	Erection of Mechanical Panel/device/Panel, connection of incoming & outgoing Pipe lines including cutting of old pipeline/connection in old pipeline. Pipe connection in drain line. Erection of tooth wheel on emergency governor	1

	& speed probe fittings in front bearing pedestal as per BHEL'S instruction. Testing of Weld joint by DPT/UT, Hydraulic test of Pipeline System. Oil flushing of EHG Pipeline & system as per BHEL norms.	
2.7	**Conventional valves**	**3.5**
2.7.1	Removal of actuators & restoration/ replacement of actuators after O/H of valves. Servicing / Overhauling/refurbishment of the Conventional valves & NRV i.e. Main Steam stop valves & it's bypass valve, CRH NRV, extraction line valves, gland steam line valves, cooling waterline valves, vacuum system valves, feed water line valves from hotwell to de-aerator & de-aerator to booster pump, Booster pump to BFP, BFP to HP Heater outlet including HP Heater bypass line valves & flash tank associated line valves etc including replacement of valve seat, if required/ checking of steam chests valves etc with DPT for any crack etc& repair as per recommendation of BHEL. Modification for valves and pipelines if required is in the scope of party. Repair/machining/ replacement and provision of spares & consumables gaskets, gland picking's, roller/ball bearings etc as required for servicing. As valves are old design, same may require machining/repairing in suitable workshop, which party have to arrange including transportation at own cost. For servicing of valves dismantling, cutting & welding of valves are in the scope of contractor.	3.5
2.8	**CONDENSER**	**2**
2.8.1	Inspection of stiffeners, tie rods, bellows, etc. & repair/replacement as necessary.	0.75
2.8.2	Inspection & repair of steam throw device.	0.75
2.8.3	Cleaning of hot well.	0.5
2.9	**Replacement of valves below 65 mm**	**2**
2.9.1	Replacement of valves i.e. root valves- secondary valves, Gauge valve, drain valves (Approx 600Nos) below Nb 65 mm. The valves will be supplied by BHEL.	2
2.10	**Lube Oil System**	**3**
2.10.1	Servicing of Lube Oil system including main oil tank cleaning, replacement of strainer mesh if required, Replacement of lube oil coolers tube nest (5 Nos.), vapour exhauster etc.	1.5
2.10.2	Servicing of oil pumps, SOP, AC & DC Lube oil pumps, Consumables such as gasket, Roller/ball bearings, gland packing, rubber cord, mechanical seal's cooling piping with valve/ tee joint/fitting etc. have to be arranged by the contractor. Repair/ machining of the as necessary, to be arranged by the contractor. However, the major spares like mechanical seal, shaft, while metal journal bearing, impellers, as required for If need replacement will be	1

	arranged by BHEL.	
2.10.3	Cleaning of lube oil pipelines with steam wash, looping of pipelines & oil flushing bypassing pedestals & with pedestal as per BHEL norms & restoration of bearings & CVSM after oil flushing.	0.5
2.11	**Heat Exchangers**	**7**
2.11.1	**Ejector** Dismantling of ejectors, servicing & overhauling, Replacement of components viz. tube nests, nozzles and diffusers and worn out parts etc and matching of P/P water side & steam side and hydro test. Consumables like gaskets & hardwares to be arranged by the contractor.	0.5
2.11.2	**LP HEATERS # 1 to 4 AND GLAND STEAM CONDENSER#1&2** Servicing of LP Heaters No. 1 to 4, Gland steam condensers (GC-1 & GC-2) including replacement of tube nests, matching P/P water side & steam side. Modification in pipeline of LPH-1A &1B if required. Consumables, steam gaskets & hardware to be arranged by the contractor.	2.5
2.11.3	**HP Heaters (3 Nos.)** Servicing of HP Heaters i.e. dismantling, checking of tube joints with headers by DPT, repair if any. Matching of mating surface including build-up, hydro test, assembly of shells and seal welding of flanges, tightening of the bolt including servicing of group protection valves, NRV & valves, restoration of all pipelines, impulse pipeline. Hot tightening after charging of HP Heaters. Consumables, gasket & hardware to be arranged by the contractor.	2
2.11.4	**De-aerator** Servicing of De-aerator, replacement/repair of trays, nozzles etc & connected valves. Trays & nozzles including all valves, safety valves, NRV's and drain lines in de-aerator system. Checking & rectification of deaerator and feed water tank. Consumable like gaskets & hardware to be arranged by the contractor. The material required for replacement of material like nozzle & trays Approx 50 Nos. has to be arranged by the contractor.	2
2.12	**Condensate extraction pumps, (3 Nos.)**	**2**
2.12.1	Replacement of condensate extraction pumps which includes removal of CEP assembly, matching of foundation, placement, matching of bearing, replacement of cooling water & oil pipelines and valves. Alignment and other checks. Replacement of Strainers including shifting of header, Cutting/welding with bellows for connection with suction flange and discharge elbow. Inspection of expansion bellows & rectifies the defect. Changing of gaskets etc wherever required. Consumable like gaskets & hardware to be arranged by the contractor.	2

	Cleaning of suction strainers of all the pumps to be done number of times before pump assembly & trial run. Also regular cleaning of suction strainers & hot well to be done during commissioning of the pumps, operation of the unit up to full loading of 72 hrs. This activity is essential to avoid pump damage due to chocking of the suction strainers.	
2.13	**Boiler Feed Pumps (3 Nos.)**	**6.5**
2.13.1	Overhauling / replacement/ servicing, alignment & commissioning of BFP system. Replacement of 1 no cartridge with new ones. Servicing of 2 nos. BFPs cartage which includes servicing, machining & assembly of old cartridges at reputed workshop, capable of doing such type of job regularly for BFPs. The necessary spares required for cartridge servicing & assembly has to be manufactured by the workshop using recommended material as per BHELs specification. The cartridge thus assembled has to be balanced prior to assembly. Contractor has to arrange this work within their quoted price. Replacement of 01 nos hydraulic couplings with new ones including removal of old, complete replacement of Oil pipeline. Servicing of 2 no hydraulic coupling. Erection of BFP lube oil piping's to coolers, erection oil coolers & its connected valves. Servicing of valves & old coolers including cleaning of coolers from oil side as well as water side including hydro test. Servicing of seal water coolers including replacement pipeline & hydraulic testing. Alignment & coupling of Motor/Hydraulic coupling, Hydraulic coupling /Pump. Servicing of Re-circulation valves (3 nos.) Replacement of Warm-up valves (03 nos.) of BFP's, its include pre heating, welding & Post heating as per BHEL Norms. Replacement of drain line & Servicing of Feed water system valves, NRV's. The consumables, gasket, fittings, ball/roller bearings as required will have to be arranged by the contractor. Steam blowing of oil pipelines, blanking of pipeline as per required, Oil flushing & pipeline normalization.	5
2.13.2	**<u>Booster pumps 03 nos.</u>** Servicing of Booster pumps & suction strainers. The consumables, gasket, fittings, ball/roller bearings as required will have to be arranged by the contractor. The major spares as required such as shaft, mechanical seals, WM bearing, wearing rings etc will be arrange by BHEL. Alignment & coupling. Commissioning of BFP, Cleaning of suction strainers of all the pumps to be done number of times before pump assembly & trial run. Also regular cleaning of suction strainers to be done during commissioning.	1.5

2.14	**HP / LP Bypass System**	**4**
2.14.1	Complete servicing/replacement of HP& LP Bypass system including oil units, valves, servomotor & Nrv's etc. Servicing of valves, servomotor, NRV & pipelines etc of HP/LP bypass spray line system including repair/machining and provision of spares & consumables gaskets, gland packing's etc as required for servicing.	4
2.15	**Replacement of Drip Pumps- 02 nos.**	**0.5**
2.15.1	Replacement of drip pumps (2 Nos.) & its commissioning including servicing of valves. Servicing of flash tank & associated valves. The consumables, gaskets, fittings as required will have to be arranged by the contractor.	0.5
2.16	**Insulation ,Hangers & supports and Painting**	**7.0**
2.16.1	Replacement / Revisioning & adjustment of all the hanger supports of TG cycle pipelines, condensate system piping, oil & water piping as per requirement of BHEL.	1
2.16.2	Re-insulation including Sheeting/cladding of piping i.e. feed water, extraction lines, drain & vent lines, drip lines, HP & LP Heaters, GSC, De-aerator & other associated piping system etc. as required including provision of insulation pads etc. as per BHEL norms. Aluminium sheet cladding will be provided by BHEL.	5
2.16.3	Removal of old paint, cleaning of surface , application of two coats of primer & two coats of finished painting for LP cylinder, Generator, condenser, CEP's, de-aerator, pedestals, pipelines, Hangers, coolers, pumps, ejector & other associated system including provision of paint as per BHEL norms. Writing on identification of pipelines / equipments etc.	1
2.17	**Other Miscellaneous Work** Machining work, floor grills/gratings, Re-work, modification & supports etc which is not in the scope, but required for successful completion of the work are covered under this scope as per requirement of BHEL.	5.0
2.18	**COMMISSIONING** **(Payment for commissioning is covered along with Milestone payments).**	
2.18.1	Flushing, steam blowing, related testing, pre-commissioning, commissioning activities of lube oil system, governing oil, gas systems, TG vacuum system, water lines and other systems of Turbine, Generator, Condenser, BFP and other auxiliaries. This includes preparation for flushing (By steam & Oil), hydro-test, steam blowing, water fill test of condenser & associated system (Note down the defect & repair all the defect in connecting pipelines to achieve vacuum) other cleaning activities, actual execution of the activities, normalization etc. Initially old CEP is used for	

	commissioning (inspection of bearing housing) after that old CEP replaced with new CEP.	
2.18.2	**PG Test** Replacement of Valves & thermowell, Installation of Flow nozzle which includes cutting of pipeline, welding of flanges in pipe end. Assembly of flow nozzle during shutdown. Installation of Pr. & temp equipment including impulse piping, cabling & Manpower assistance during PG Test.	
2.18.3	**Steam blowing** Laying of temporary piping, valves, blanks in CRH line before hydro Test etc for steam blowing of TG cycle piping & target plates for steam blowing to be done by the party. Temporary suitable supports for the piping to be provided. Removal of temporary piping & blanks after completion of steam blowing operation & return to BHEL store. Restoration of ESV's, IV's & CV's after steam blowing operation.	
2.18.4	Setting and commissioning of governing system.	
2.18.5	Trial run, commissioning & stabilization of system & auxiliaries, stabilization and attending to post commissioning defects, Any rework as required for improving the performance of the equipments will be within scope of the party. **Note:** Party has to ensure deployment of competent groups round the clock for commissioning activities, attending to defect and adjustments as required. In case party is observed to default this, BHEL will additionally deploy such manpower from any other agency on risk & cost of the party.	
2.18.6	Preparation of MIRs, following of safety and quality norms and documentation, preparation of material status and up-gradation of activities, networks at regular intervals.	
2.18.7	Restoration of floor grills/gratings in proper manner removed during the erection works.	

3	**The following points to be noted carefully by the party):**
3.1	During dismantling of the equipment, party has to ensure that the components, hardware etc removed from the equipments is properly tagged and preserved properly. Any such loss/damage arising out of negligent handling & upkeep by the party has to be made good by the party. Such loss will be recovered from the R.A. Bills of the party as per BHEL norms & penalty may be imposed as per discretion of site engineers.
3.2	Party has to deploy competent Engineer/ Supervisor in each area to plan & execute the work as per schedule. Report of daily work planning & execution status to be submitted to BHEL regularly.
3.3	Party shall keep the area of work clean & shall remove debris etc while executing day to day work. In the event of his failure to do so the same will be arranged to remove by BHEL. The expense there of will be recovered from party by any lawful means available with BHEL.
3.4	All repair/machining/replacement of components/parts etc. & provision of hardware & consumable as per requirement to be arrange by party without any extra cost including transportation.
3.5	**Facilities to be provided by Sub-contractor to BHEL**
3.5.1	Contractor has to supply all paints, primers and other consumables for painting of relevant area of TG & its Auxiliaries of Unit 13. BHEL reserves the right to reject any material not found satisfactory. Contractor shall produce manufacturer's test certificate.
3.5.2	Supply of other consumables like gaskets, gland packings, sealing compound, damaged fastners, roller bearings, gluing & Varnishing materials, tapping and putty materials for all bushings for generator as per BHEL norms are in scope of contractor molykote for auxiliaries and valves (other than ESV,IV,HP & IP control valves), spares of Dearator tray nozzles etc shall be in the scope of contractor within the finally accepted rates. Fasteners shall be removed by grousing wherever required.
3.6	**Secondary Grouting** Grouting of equipment basis if required, including anchor/foundation bolts, etc. as may be applicable, chipping, matching, repair etc. Including provision of materials including non shrinkable cement as required. Repair of grouting where ever required. However, no grouting is envisaged but it will be need based.
3.7	**Preservation** Preservation of TG & Aux. Components after: ➢ Dismantling of TG & AUX. ➢ Receipt from BHEL Store.
3.8	**SITE VISIT** Contractor should visit site and acquire full knowledge & information about site conditions. The bidder must visit site, to acquaint themselves with the conditions

	prevailing at site and in & around the plant premises, together with all statutory, obligatory, mandatory requirements of various authorities before submission of bid.
3.9	**SITE ORGANISATION** The contractor shall provide adequate staffing in the following areas in addition to the staffing requirements of execution as instructed/informed by BHEL: ➢ Overall planning, monitoring & control. Quality control and quality assurance. ➢ Materials management. ➢ Crane operators for EOT crane. ➢ Safety, fire & security. ➢ Industrial relations and fulfilment of labour laws and other statutory obligations.
3.10	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.
3.11	On award of contract, the contractor shall submit to BHEL site organization chart indicating the various levels of experts to be deployed on the job. BHEL reserves the right to reject or approve the list of personnel proposed by the Contractor. The persons, whose bio-data have been approved by BHEL, will have to be posted at site and deviations in this regard will not generally be permitted.
3.12	The contractor should also submit to BHEL for approval a list of Dismantling / erection tools & tackle etc prior to commencement of site activities. These tools & tackles shall not be removed from site without written permission of BHEL.
3.13	The organization chart for site should indicate the various levels of experts to be posted for supervision in the various fields in R & M, commissioning etc as applicable. For proper supervision of the work, the contractor shall ensure providing one qualified supervisor against deployment of 20 workmen.
3.14	**ERECTION SCHEDULE** Contractor shall submit within 30 days of LOA date, detailed program (L2 schedule) of construction/erection/commissioning, for approval to Site In-Charge/Construction Manager. L2 schedule shall be the working level document demonstrating contractor's ability and methods of completing the work within the key milestones identified in the tender specification These program would be amplified showing start of erection and subsequent activities and shall form the basis for site execution and detailed monitoring, The three monthly rolling program with the first month's program being tentative based on the site conditions would be prepared based on these program. The Contractor shall also be involved along with the Customer/BHEL to tie up detailed resource mobilisation plan over the period of time of the contract matching with the performance target.
3.15	The program would be jointly finalised by the site in-charge of the contractor with BHEL/Customer's project coordinator as well as the site planning representative. The

	R&M program will also identify the sequential erectable activity percentage.
3.16	**The contractor under this contract shall also provide free of cost services of following manpower exclusively for use by BHEL;** ➢ Unskilled workers for working in store, colony & office for a total 30 man months. ➢ Skilled workers for a total 15 man months. ➢ Computer operator for a total 15 man months. ➢ Persons so deployed shall have to work in extended hours whenever required. Workmen provided as per the above provisions shall be fully trained and experienced in the nature of work for which they are deployed. ➢ Ex-OEM personal for supervision of various R&M activities for total 5 man-months. **In case contractor fails to provide above-mentioned engineers/Ex-OEM as desired by BHEL, the latter shall have the right to hire such services from other agencies at the risk and cost of the contractor. In case these services are not utilized for any reason whatsoever, fully or partly, recovery at the rate of the prevailing minimum wages at OBRA for the categories given plus 25% will be made from the final bill of the contractor. In case of Ex OEM personal deduction shall be done @ RS-90000/month.**
3.17	**Contractor shall ensure following:**
3.17.1	Contractor has to maintain contact with local hospital having ambulance facility, scanning & other ultra modern medical facilities required during emergency.
3.17.2	Contractor has to ensure pre employment medical check for all staff & workers.
3.17.3	Contractor has to ensure that adequate First Aid facilities with trained nurse are available at work site for emergency purpose. This emergency set-up should include, but not limited to, following: ➢ Male nurse (in shifts) ➢ Oxygen set up ➢ Breathing apparatus ➢ Eye wash facility ➢ Stretcher ➢ Trauma blanket ➢ Medicines. ➢ In addition to above, BHEL (through its other contractor) may arrange ambulance at work site for emergency purpose, which can be utilized by the contractor in case of emergency. ➢ The charges for the same will be decided mutually at site. In case, under unavoidable circumstances, if the ambulance is not available / being used

	elsewhere, the contractor will have to arrange for the same as under clause 2.7.1.
3.18	**<u>The contractor shall comply with following towards Social Accountability</u>** ➢ The contractor shall not employ any employee less than 15 years of age in pursuant to ILO convention. If any child labour were found to have been engaged, the Contractor shall be levied with expenses of bearing his education expenditure which will include stipend to substantiate appropriate education or employ any other member of family enabling to bear the child education expenditure ➢ The contractor shall not engage Forced/ Bonded Labour and shall abide by abolition of Bonded Labour System (Abolition) Act, 1976. ➢ The contractor shall maintain Health & safety requirement as stipulated in the Contract and Contract Labour (Regulation & Abolition) Act, 1970. ➢ The Contractor shall abide by UN convention w.r.t. Human Rights and shall be liable for Discrimation/ Corporal Punishment for failure in meeting with relevant requirements. ➢ The Contractor shall abide the requirement of Contract Labour (Regulation & Abolition) Act, 1970 for working hours. ➢ The Contractor shall abide by the statutory requirement of Minimum Wages Act 1948, payment of Wages Act 1936. ➢ The Contractor shall arrange potable drinking water to its employees & workers.
3.19	In order to meet the environmental concerns it is expected that the contractor shall plant, protect and maintain at least 200 trees or equivalent in the vicinity of the project as per the available space and as per the advice of Engineers. Contractor shall ensure daily housekeeping and keep proper cleanliness of work place and do the disposal of wastes to certified area.
3.20	Payment of other miscellaneous work as per clause 2.17 of chapter-II is made on actual estimation details and final percentage will be freeze on actual estimation by BHEL Engineer.
3.21	The contractor shall arrange entry/exit gate passes for Manpower, Materials & Vehicles from concerned security agency of the customer at their own cost as per the prescribed procedures of the customer. The contractor must get the character & antecedents of all personnel deployed at site duly verified from the concerned police station/ S.P. office as required by CISF. Contractor shall arrange permanent gate pass after one month of personnel deployed at site.

4.0	**FACILITIES TO BE PROVIDED BY BHEL/ CONTRACTOR**			
S.No.	**Description**	**Scope /to be taken care by**		**Remarks**
		BHEL	**BIDDER**	
4.1	**ESTABLISHMENT**			
4.1.1	**FOR CONSTRUCTION PURPOSE**			
A.	Open space for office	YES		Limited space (free of charge) As and where made available by customer M/s UPRVUNL
B.	Open space for storage	YES		Limited space(free of charge) As and where made available by customer M/s UPRVUNL
4.1.2	**FOR LABOUR COLONY**			
A	Open space		YES	Contractor have to make their own arrangement
4.2	**ELECTRICITY**			
4.2.1.	**Electricity for construction purposes (415 V) (chargeable/free)**			**Free of Cost**
4.2.1.1	Single point source	YES		
4.2.1.2	Further distribution for the work to be done which include supply of materials & execution		YES	
4.2.2	**Electricity for the office, stores, etc of the bidder**	**YES**		**Free of cost**

	which include:			
4.2.2.1	Distribution from single point including supply of materials & service		YES	
4.2.2.2	Supply, Installation & connection of material of energy meter including operation & maintenance		N. A.	
4.2.2.3	Electricity for living accommodation of the bidder's Staff, engineers, supervisors etc. on the aboveLines		YES	**Contractor have to make their own arrangement**
4.2.2.4	Duties & deposits including statutory clearances for above		YES	
4.2.2.5	Demobilization of the facilities after completion of works		YES	
4.3	**WATER SUPPLY**			
4.3.1	**FOR CONSTRUCTION:**			
4.3.1.1	Making the water available at single point	YES		
4.3.1.2	Further distribution as per the requirement of work including supply of materials & execution		YES	
4.3.2	**LABOUR COLONY:**			
4.3.2.1	Making the water available at single point		YES	**Contractor have to arrange on his own.**
4.3.2.2	Further distribution as per the requirement of work including supply of materials & execution		YES	**Contractor have to arrange on his own.**
4.4	**LIGHTING**			
4.4.1	For construction work (supply of all materials) 1. At office storage area 2.At preassembly area 3.At construction site/area		YES	**Contractor have to arrange on his own.**

4.4.2	For construction work (execution of lighting work/arrangements) 1. At office storage area 2. At preassembly area 3. At construction site/area		YES	
4.4.3	Providing the necessary consumables like bulbs, Switches, etc during the course of construction		YES	
4.5	**Communications facilities for site operations of the bidder**			
4.5.1	Telephone, fax , internet, intranet, email etc.		YES	
4.6	**COMPRESSED AIR SUPPLY**	YES		
4.6.3	Supply of the all the consumables for the above system during the contract period		YES	
3.7	**ERECTION FACILITIES**			
4.7.1	Providing erection drawings for all the Equipments covered under this scope	YES		
4.7.2	Drawings for construction method	YES	YES	
4.7.3	As-built-drawings-where ever deviations Observed & executed and also based on Decisions taken at site		YES	
4.7.4	Shipping lists etc for reference & planning the Activities	YES		
4.7.5	Preparation of site erection schedules and other input requirements		YES	
4.7.6	Review of performance & revision of site erection schedules in order to achieve the end dates & commitments	YES	YES	
4.7.7	Weekly erection schedule based on Sl. No.3.7.5		YES	

4.7.8	Daily erection/work plan based on Sl. No.3.7.7		YES	
4.7.9	Periodic visit of senior official of bidder to site to review the progress so that works are completed as per schedule. It is suggested this review by the senior official of the bidder should be done once in every two month		YES	
4.7.10	Preparation of preassembly bay		YES	
	Notes:			
a)	BHEL will not be responsible for any loss or damage to the contractor's equipment as a result of variation in voltage or frequency or interruptions in power supply.			
b)	The Contractor shall be responsible for providing all necessary facilities like residential accommodation, transport, electricity, water, medical facilities etc. at his own cost as required under various labour laws and statutory rules and regulations framed there under to the personnel employed by him.			
c)	Provision of distribution lines of electrical power from the central points to therequired place with proper distribution boards observing the safety rules laid down by the electrical authorities of the state shall be done by the contractor, supplying all the materials like cables, distribution board, switch boards, TPN, CBS, ELCBS/ MCCBS/ Copper / Brass clamps, copper conductor, change over switches pipes etc. at his own cost. If any failure is caused in supply of the power and water, it is the responsibility of the contractor to make alternate arrangements at his cost. The contractor shall adjust his working shifts / hours accordingly and deploy additional manpower if necessary so as to achieve the targets.			
d)	The contractor while drawing construction power supply from Distribution Board should strictly adhere to following points:			
i.	All electrical installations should be as per Indian Electricity rules.			
ii.	All distribution Boards installed by the contractor should be constructed with fireproof materials viz. Steel frames, Bakelite sheets etc.			
iii.	Connection for single phase should be taken from phase and neutral. Nowhere the connection should be taken with earth as neutral.			
iv.	All electrical connections should be made through connectors, nuts and bolts, switches, plug and sockets. Loose connections or hooking up of wires shall not be permitted.			
v.	Contractors have to make their own earthing arrangement for their equipment / DB earthing.			

vi.	All electrical equipment / tools and plants should be properly earthed. DBs to be earthed diagonally opposite at two points.
vii.	Contractor should use "MCCB" and "ELCB" either on incoming or outgoing connections to the DBs.
viii.	Contractor should ensure that all the CBs / TPNs/ Fuses/ MCCB / ELCB cables etc. should be of adequate rating/ capacity.
ix.	For permission of supply connections contractor has to submit a test report of their installations with a single line diagram of connected/ proposed loads.
x.	ELCB will be tested once in a week or as directed by BHEL by actually simulating the earth leakage for all installations and the same shall be recorded in the logbook to be maintained by the contractor.
xi.	In case of power cuts / load shedding no compensation for idle labour or extension of time for completion of work will be given to contractor.
xii.	On completion of work or as and when required by BHEL, all the temporary buildings, structures, pipe lines, cables etc. shall be dismantled and leveled and debris shall be removed, as per instructions of BHEL, by the contractor at his cost. In the event of his failure to do so, the Engineer will get it done and expenses incurred shall be recovered from the contractor along with prevailing overheads. The decision of BHEL Engineer in this regard shall be final.

5.0	**T&P AND MMD DEPLOYED BY CONTRACTOR**			
Sl No.	**Item Description**	**Capacity**	**Qty**	**Duration**
5.1	Hydra Crane	12 T / 14 T	1 no	On hire basis APR*
5.2	Trailer	15 T/ 20 T cap	1 no	On hire basis APR*
5.3	Tractor trolley	APR	APR	APR
5.4	Winces of suitable capacity	2T/3T/5T/10T	APR**	APR
5.5	Hand Operated Megger 500 / 1000 V	APR	APR	APR
5.6	Tong Tester 10, 20 Or 50 Amp + / - 3 % Accuracy.	APR	APR	APR
5.7	Digital and Analogue Multimeters	APR	APR	APR
5.8	Welding sets with accessories and ovens for welding electrodes backing and holding	APR	2 nos	APR
5.9	Chain pulley blocks and pulleys of suitable capacities	1T/2T/5T	1 nos each	APR
5.10	Three phase distribution board with complete set for distribution of construction power	400 Amps	APR	APR
5.11	Electric cables for distribution of construction power		APR	APR
5.12	Tarpaulin		APR	APR
5.13	Torque Wrench		APR	APR

Sl. No.	**T&P/ IMTEs Description**	**(Size / Specification)**	**Qty.**
1.	Slip gauge		1 Set
2.	Outside micrometer	(25-50 mm) / (50-150 mm)	2 Nos./1 Nos
3.	----------do----------	(150-300 mm) / (300-600 mm)	1 Set each
4.	Inside micrometer	(25-1000 mm)/(50-1500mm)	1 set
5.	Dial bore gauge	(25-60 mm)	1 Set
6.	Venier Calipers	(0-300 mm)	1 Nos
7.	Depth micrometer	(0-150 mm)	1 Set
8.	Telescopic gauge	(5-50 mm)	1 Set
9.	Dial gauge with magnetic base	(.01 mm acc.)	10 Nos
10.	Feeler Strips	(0.03*300 mm	10 Nos
11.	do	(0.04-0.10)*300 mm)	4 Sets
12.	Feeler gauge	(0.05-1.00)*300 mm)	2 Sets
13.	Steel Scale	(100m m) / (500 mm)	2 No. each
14.	Taper gauge	(0-20 mm)	1 Set
15.	Heating/brazing torch with nozzles		1 Set
16.	Cutting torch		1 No.
17.	Oxyacetylene regulators		2 Sets
18.	Slings	(10 mm - 30 mm)	2 Set
19.	Eye bolt up to size of 46 mm	(3 ton, 5 ton)	2 Sets
20.	Chain pulley block		
21.	----------do----------	10 ton	1 no
22.	Pull - lift	(5 ton)	2 Nos
23.	Bench grinders		2 Nos
24.	Spanners (rings, D, box, slogging (ring &DE)	up to size of 46 mm	2 Sets
25.	---------do----------	Size for 50-90 mm	1 Set
26.	Tap Sets Dies	up to size of M85	Sets
27.	do	M 18 to M 85	1 Set

28.	Drill machine	Dia 1"/ Dia 1/2"/ Dia 1/4"	4 Nos
29.	Grinder	FF -2 / AG-4/ AG-7 / GQ-4 / GQ-7	4 Nos. each
30.	Drill bits/reamers	(up to - 25 mm)	3 Sets
31.	-do-	Above 25 mm	1 set
32.	Multimeter		1 No
33.	Hydraulic jacks	50 ton	4 Nos
34.	Welding Generator		1 No
35.	Argon welding set with gas		1 Set
36.	Reaming/Honing Tools		2 Sets

***APR- Contractor has to deploy T&P as per the requirement of BHEL site as decided byBHEL Engineer In-charge.**

NOTES:

a) The above list specifies only major T&P/MMD (may not be complete to be deployed by the contractor for the respective packages. All additional/ other tools and plants which are required for satisfactory & timely completion of work of the respective packages shall also be deployed by the contractor within finally accepted rate/ price.

b) If works gets delayed due to non-availability of T&P and MMD, BHEL reserves the right to get work done at the risk &cost of contractor without prejudice to right of BHEL as in GCC.

c) All the T&P and IMTEs to be used by the contractor must be available with valid calibration/testing certificates in original as applicable and the contractor shall submit the list of T&Ps and IMTE's deployed along with their calibration/testing certificate.

d) Contractor must re-ascertain/ recheck range and accuracy of each IMTE from BHEL Engineer well in advance before arranging calibration/ deployment.

e) Other terms and conditions regarding above items shall be as per T&P clause in SCC.

f) T& P's required for shifting of material from store to site shall be arranged by contractor over and above T&P's provided by BHEL.

g) All consumables like welding electrodes(General purpose & special), filler wires, gases, cotton waste, emery cloth, hack saw blades, jointing compounds, petrol/diesel, anti-rust and anti-seize compounds, molykote, holdite, hylomar, Stack-B, Selastik compound, Resi bond, grease, araldite, jointing sheets, rubber cords, PVC sheets, Oil/ water/steam gaskets, Shims(APR size), O rings(APR size), rubber cords(APR size), gland packing, gland rope, fasteners up to 36mm sizes (HT nut, bolt, washers), thermal chalks, consumables for NDT, etc, shall be arranged by the contractor at their own cost, as per requirement. Only BHEL approved spares / consumable.

h) Welding Electrode for HP/IP & LP Turbine welding works shall be provide by BHEL free of cost.

6.0	T&Ps TO BE DEPLOYED BY BHEL			
Sl. No.	Description & Capacity of T & P	Capacity	Qty	Remark
6.1	Crawler Crane (for unloading of LP rotor)	135 T	1 No.	On sharing basis as per availability (free of cost)
6.2	EOT crane	3 nos installed in TG hall		However contractor shall provide EOT Operators 2 nos as per requirement

<table>
<tr><td>7.0</td><td>TIME SCHEDULE</td></tr>
<tr><td>7.1</td><td>The contractor is required to commence the work of material management within 15 days from the date of issue of letter of award (LOA).Erection testing and commissioning work will be started from 4th month of start of work of this contract, unless BHEL decides to fix any other later date. However, BHEL Engineer will certify the actual date (zero date) of start of work after adequate mobilization of manpower, material handling equipment and other T&P by the contractor. Defect liability period will be 01 year from 1st synchronization of unit</td></tr>
<tr><td>7.2</td><td>DELIVERY PERIOD- Entire work as detailed in the tender specifications for package :- Obra R&M: Unit13 shall be completed within 15 months from the Zero date as per program/ milestones indicated by BHEL Engineer. Contractor has to mobilize adequate resources to meet BHEL’s commitments to their customer as indicated from time to time.</td></tr>
<tr><td>7.3</td><td>The erection work shall be commenced on the mutually agreed date between the bidder and BHEL engineer and shall be deemed as completed in all respect only when the unit is in operation. The decision of BHEL in this regard shall be final and binding of the contractor. The scope of work under this contract is deemed to be completed only when so certified by the site Engineer.</td></tr>
<tr><td>7.4</td><td>Contract Duration</td></tr>
<tr><td></td><td>The various milestones dates to be achieved for TG Work of U# 13, as per the current status of contract are as below:
<table>
<tr><th>MILE STONES</th><th>MONTH</th></tr>
<tr><td>➢ Dismantling of Turbine, Generator & Aux.</td><td>0-2</td></tr>
<tr><td>➢ Refurbishment of TG Start &Turbine Box-up</td><td>3-6</td></tr>
<tr><td>➢ BFP Replacement & assly start</td><td>3-9</td></tr>
<tr><td>➢ Oil Flushing Completion</td><td>10</td></tr>
<tr><td>➢ Barring Gear</td><td>11</td></tr>
<tr><td>➢ Synchronization</td><td>12</td></tr>
<tr><td>➢ FULL LOAD</td><td>13-14</td></tr>
<tr><td>➢ Trial operation & Handing over</td><td>15</td></tr>
</table></td></tr>
<tr><td>7.5</td><td>The contractor has to ensure that work is completed in all respects leaving no pending points. However the punch list/ pending points, which are possible to be attended at site, shall be fully liquidated within one month from successful completion of Facilities.</td></tr>
<tr><td>7.6</td><td>The work under the scope of this contract is deemed to be complete in all respects, only when the contractor has discharged all the responsibilities laid down in the contract. The decision of BHEL on completion date shall be final and binding on the contractor.</td></tr>
</table>

7.7	COMMENCEMENT OF CONTRACT PERIOD AND TENTATIVE SCHEDULE Entire work asdetailed in the tender specifications shall be completed within 15 monthsfrom the Zero date as per programme / milestones indicated by BHEL Engineer. Contractor has to mobilize adequate resources to meet BHEL's commitments to their customer as indicated from time to time.
7.8	The slippage of two intermediate milestones identified for penalty as per project/package are 1) 1st Milestone (M1) is Barring Gear (Completion period 11th month from start of contract period). 2) 2nd Milestone (M2) is Synchronization (Completion period 12th month from start of contract period).
7.9	There is provision of penalty in case of slippage of intermediate milestones as following:- **a.** Activity mentioned above at 7.8 is termed as M1 and M2 for making provisions of penalty in case of slippage of these milestones for unit 13. **b.** In case of slippage of these intermediate millstones (M1, M2), delay analysis shall be carried out on achievement of each of above milestones. **c.** 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. **d.** 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. **e.** 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. **f.** Amount required to be withheld on account of slippage of milestone M1, and M2 shall be withheld out of respective milestone payment and balance amount (if any) shall be withheld @ 10% of RA bill amount form subsequent RA Bills. **g.** Final deduction towards LD (if applicable), 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 milestone M1, M2, shall be adjusted against LD or released as the case may be. **h.** In case of termination of contract due to any reason attributable to contractor before completion of work, the amount already withheld against slippage of milestone M1, M2 shall not be released and be converted into recovery. Executable Contract Value* means- Value of work for which inputs/fronts were made available to contractor, and which were scheduled for execution till the date of achievement of respective milestone.

8.0	TERMS OF PAYMENT	
8.1	The 'Engineer' will certify regarding the actual work executed in the measurement books and bills, which shall be accepted by the contractor in measurement book.	
8.2	Contractor shall submit bills for the work completed under the specification, once in a month detailing work done during the month. The format for billing shall be approved by BHEL before raising invoices.	
8.3	Subject to any deduction that BHEL may be authorised to make under the contract, the contractor on the certificate of the Engineer at site be entitled for payment as explained hereunder.	
8.3.1	**Interest bearing recoverable advance: Applicable as per Clause No. 2.13 of GCC.**	
8.3.2	**PROGESSIVE PAYMENT ON PRORATA BASIS**	
A.	**85(Eighty Five) %of the contract value along with corresponding tax as monthly progressive payments on pro rata basis (as per percentage break-up given in the scope of work (Chapter II of TCC Part-I)& applicable on items Sl. No. 1 to Sl. No. 18covered under ANNEXURE – I "Bill Of Quantity" Chapter XI for actual completed work.**	
B.	**FOR STAGE/ MILESTONE PAYMENTS** **15(Fifteen)% of the contract value along with corresponding tax as monthly progressive payments on pro rata basis (as per percentage break-up given below) for actual completed work.**	
a)	CEP Trial run	0.5 %
b)	BFP Trial run	0.5 %
c)	Water fill test of condenser and associated systems. Rectify defect for improvement of vacuum	1%
d)	Oil Flushing completion	1%
e)	M/C on Barring Gear	0.5%
f)	Steam Blowing	2%
g)	Rolling and Synchronization	1%
h)	Full Load of Unit	0.5%
i)	PG Test	2%
j)	Punch list point/ pending points liquidation	1%
k)	Completion of contractual obligations	5%
l)	**TOTAL FOR STAGE/ MILESTONE PAYMENTS (15%)**	**15%**
8.4	All payment shall be subject to statutory deduction as per rule.	

8.5	Necessary documents as specified in GCC shall be submitted with bill.
8.6	All payment shall be made by Electronic Fund Transfer and necessary Bank details shall be furnished by the Sub-contractor.

9.0	**TAXES AND DUTIES**
9.1.1	Price quoted should be inclusive of all applicable Taxes/charges **Excluding GST**. The Contractor shall pay all other taxes, fees, royalty, commission etc. which may be levied on the contractor in executing the contract. In case BHEL is forced to pay any of such taxes, it shall be recovered from Contactor's bills or otherwise as deemed fit. **GST Shall be payable extra as per following** :
9.1.2	Contractor/Vendor has to issue invoice indicating HSN/SAC code, Description, Value, Rate, applicable tax and other particulars in compliance with the provisions of relevant GST Act and Rules made thereunder. With the implementation of e way bill provisions, contractor shall comply with same as applicable.
9.1.3	Vendor has to submit GST compliant invoice within seven days from the due date of invoice as per GST Law. In case of delay, BHEL reserves the right of denial of GST payment if there occurs any hardship to BHEL in claiming the input thereof. In case of goods, vendor has to provide scan copy of invoice & GR/LR/RR to BHEL before movement of goods starts. Special care should be taken in case of month end transactions.
9.1.4	GST amount claimed in the invoice shall be released on fulfilment of all the following conditions by the Contractor : - a. Supply of goods and/or services have been received by BHEL. b. Original Tax Invoice has been submitted to BHEL. c. Respective invoice has appeared in BHEL's GSTR - 2A for the month corresponding to the month of invoice. Alternatively, BG of appropriate value may be furnished which shall be valid at least one month beyond the due date of confirmation of relevant payment of GST on GSTN portal or sufficient security is available to adjust the financial impact in case of any default by the contractor.
9.1.5	Contractor shall be solely responsible for discharging his GST liability according to the provisions of GST Law and BHEL will not entertain any claim of GST/interest/penalty or any other liability on account of failure of contractor in complying the provisions of GST Law or discharging the GST liability in a manner laid down thereunder.
9.1.6	In case declaration of any invoice is delayed by the vendor in his GST return or any invoice is subsequently amended/altered/deleted on GSTN portal which results in any adverse financial implication on BHEL, the financial impact thereof including interest/penalty shall be recovered from the Contactor's due payment.
9.1.7	Any denial of input credit to BHEL or arising of any tax liability on BHEL due to non-compliance of GST Law by the Contractor in any manner, will be recovered along with liability on account of interest and penalty (if any) from the payments due to the Contactor.
9.1.8	The admissibility of GST, taxes and duties referred in this chapter or elsewhere in the contract is limited to direct transactions between BHEL & its Contractor. BHEL is not responsible for any liability that may arise due to any transaction beyond the direct transaction between BHEL & its Contractor.

9.1.9	**Variation in Taxes & Duties:** Any upward variation in GST shall be considered for reimbursement provided supply of goods and services are made within schedule date stipulated in the contract or approved extended schedule for the reason solely attributable to BHEL. However downward variation shall be subject to adjustment as per actual GST applicability. In case the Government imposes any new levy/tax on the output service/goods after price bid opening, the same shall be reimbursed by BHEL at actual. The reimbursement under this clause is restricted to the direct transaction between BHEL and its contactor only and within the contractual delivery period only. 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/Contractor must convey its impact on his price duly substantiated by documentary evidence in support of the same before opening of price bid. Claim for any such impact after opening the price bid will not be considered by BHEL for reimbursement of tax or reassessment of offer.
9.1.10	**Modalities of Tax Incidence on BHEL:** Where GST law permits more than one option or methodology for discharging liability of tax/ levy/ duty; the contractor shall approach BHEL before choosing any option to discharge his tax liability. BHEL shall have the right to direct the contractor to adopt the appropriate option considering the amount of tax liability on BHEL as well as procedural simplicity with regard to assessment of the liability. The option chosen by BHEL shall be binding on the contractor for discharging the obligation of BHEL in respect of the tax liability to the contractor.
9.2	**BUILDING & OTHER CONSTRUCTION WORKERS (REGULATION OF EMPLOYMENT AND CONDITIONS OF SERVICE) ACT, 1996 (BOCW Act) AND RULES OF 1998 READ WITH BUILDING & OTHER CONSTRUCTION WORKERS CESS Act, 1996 & CESS RULES, 1998.**
	In case any portion of work involves execution through building or construction workers, then compliance to the above titled Acts shall be ensured by the contractor and contractor shall obtain license and deposit the cess under the Act. In the circumstances it may be ensured as under:-
9.2.1	It shall be the sole responsibility of the contractor in the capacity of employer to forthwith (within a period of 15 days from the award of work) apply for a licence to the Competent Authority under the BOCW Act and obtain proper certificate thereof by specifying the scope of its work. It shall also be responsibility of the contractor to furnish a copy of such certificate of licence / permission to BHEL within a period of one month from the date of award of contract.
9.2.2	It shall be the sole responsibility of the contractor as employer to ensure compliance of all the statutory obligations under these act and rules including that of payment / deposit of 1% cess on gross payment made for value of work involving building or construction workers engaged by the contractor within a period of one month from the receipt of payment.period of one month from the receipt of

	payment.
9.2.3	It shall be the responsibility of the sub-contractor to furnish the receipts /challans towards deposit of the cess together with the number, name and other details of beneficiaries (building workers) engaged by the sub-contractor during the preceding month.
9.2.4	It shall be the absolute responsibility of the sub-contractor to make payment of all statutory payments & compensations to its workers including that is provided under the Workmen's Compensation Act, 1923.
9.2.5	The contractor shall, however ensure before deposit of any BOCW Cess, that customer is not depositing the same in order to avoid excess deposit of cess.
9.2.6	The contractor shall bear cost of BOCW cess either by way of deposit or through recovery by BHEL in case the same is deposited by the customer.
9.2.7	In case of failure in above mentioned compliances, BOCW Cess @ 1% as well as applicable penalty as specified in BOCW Act/Rules shall be deducted from the contractor.

10.0	**OTHER CONDITIONS**
10.1	**DEFECT LIABILITY PERIOD**
a.	**Defect liability period will be 1 year from 1st Synchronization of Unit. Contractor shall attend the defects noticed during stabilization & defect liability period.**
10.2	**<u>Gate pass & POLICE VERIFICATION OF PERSONNEL:</u>** **The agency shall arrange entry/exit gate passes for Manpower, Materials & Vehicles from concerned Security Agency of the Customer at their own cost as per the prescribed procedures of the customer. The agency must get the character & antecedents of all personnel deployed to site duly verified from the concerned Police station/ S. P. Office as required by CISF.**

Annexure-I

S.No.	Description	% Allotted of Contract Value
1.0	**MAIN TURBINE**	**25.00**
2.0	**GENERATOR**	**7.00**
3.0	**Generator Auxiliaries**	**2.50**
4.0	**Replacement of rotor heating & studs heating line**	**2.00**
5.0	**Valves &Servomotor**	**5.00**
6.0	**Installation of EHG Mechanical**	**1.00**
7.0	**Conventional valves**	**3.50**
8.0	**CONDENSER.**	**2.00**
9.0	**Replacement of valves below 65 mm**	**2.00**
10.0	**Lube Oil System**	**3.00**
11.0	**Heat Exchangers**	**7.00**
12.0	**Condensate extraction pumps, (3 Nos.)**	**2.00**
13.0	**Boiler Feed Pumps (3 Nos.)**	**6.50**
14.0	**HP / LP Bypass System**	**4.00**
15.0	**Replacement of Drip Pumps- 02 nos**	**0.50**
16.0	**Insulation ,Hangers & supports and Painting**	**7.00**
17.0	**Other Miscellaneous work**	**5.00**
18.0	**Commissioning** (Payment for commissioning already covered in Milestone Payment)	**-**
Note-: Further bifurcation of above percentages is as per “Scope of Work” as mentioned in “Chapter II :SCOPE OF WORK” of TCC Part-I		
19.0	**Milestones**	**15.00**
Note-: Further bifurcation of above percentages for milestone is as per table given in Clause 8.3.2 (B) of Terms of Payment of TCC Part-I		

Annexure-I

SAFETY BELT WITH FULL BODY HARNESS

COMPLIANCE WITH STANDARDS

It shall comply with IS 3521-1999. (CE-EN 358; CE-EN361, EN 364, CE Certification Lanyard – En 354)

TECHNICAL REQUIREMENT

1) It shall be of Class "A" type (Fall Arresting) of the IS referred above.
2) It shall consist of fully adjustable waist belt, shoulder belt, thigh belt, lanyard and anchoring components.
3) The shoulder and waist belt shall be made out of Nylon / polyester /synthetic webbing of width of 40.0 mm and 3.0 mm thick provided with permanent ISI marking.
4) It shall be provided with Friction adjuster, Buckles for fastening and Semi triangular Block ring.
5) The lanyard shall be of 10mm dia., 3.0 mtrs. length of Nylon / Polyester / Polypropylene .
6) One end of the rope shall be directly spliced and the other end shall be thimble and spliced to a hook.
7) The buckles and adjusters shall be Nickel plated and the hook galvanized.
8) The joints are to be machine stitched or additionally riveted with copper rivets as specified in the enquiry.

9) The construction of the belt shall be as per IS and/or EN standard as specified.

MARKING

The Safety belt shall be marked with the following information

a) Relevant ISI, EN, ANSI marks

b) Supplier identity

c) Month & year of manufacturing

Annexure-II

ROPE GRAB FALL ARRESTER

COMPLIANCE WITH STANDARDS

It shall comply with as per the relevant IS code and equivalent to EN 353-2: 2002.

TECHNICAL REQUIREMENT

a) The design of fall arrester should be such that it can be conveniently clasped on to an anchorage line so as to accompany the user without requiring manual adjustments during upward or downward movements.

b) The Fall Arrester should work on minimum 14 mm diameter, polyamide rope as anchorage line (main line).

c) The Fall Arrester shall be made from Stainless Steel and the design of the same must conform to relevant Indian standard (IS code) or equivalent to EN 353-2: 2002.

d) The Fall Arrester should have steel karabiner as attachment and gravity locking to prevent incorrect use and should have double security opening system as per the relevant IS code or equivalent to EN 353-2: 2002.

MARKING

The Fall Arrester shall be marked with the following information

a) Relevant ISI, EN, ANSI marks

b) Supplier identity

c) Month & year of manufacturing

Annexure-III

INDUSTRIAL SAFETY NET

COMPLIANCE WITH STANDARDS

It shall comply with IS: 11057 - 1984.

TECHNICAL REQUIREMENT

a) The net shall be made from manmade fiber ropes and plaited cord, with the exception of polyethylene ropes and cords and confirming the Basic Design as per the clause 3 of IS:11057-1984.

b) The nominal size of the net should be 6 M X 4 M in length and width respectively. For other dimensions Net should confirm clause 4 & 5 of IS:11057-1984.

c) The performance of safety nets shall be tested as per clause 6 and Appendix "A" of IS:11057-1984.

d) Marking should be as per clause 7 of IS:11057-1984. Each net shall be provided with soft, flexible, permanent labels of textile or plastic material at two different positions and marked with indelible ink in letter of 3 cm in height.

MARKING

The Industrial Safety Net shall be marked with the following information

a) Relevant ISI, EN, ANSI marks

b) Supplier identity

c) Month & year of manufacturing

ANNEXURE-A

13.0	**RATE SCHEDULE (UNPRICED)**	
Item No.	**DESCRIPTION OF WORK**	**Total Value In Rupees A (In figures and words)**
13.1	**Total Lumpsum price for complete scope of dismantling, erection, testing, commissioning, trial operation, handing over of Turbine, Generator & Auxiliaries, of Unit No.13 at 5x200 MW, UPRVUNL Obra including insulation, final painting etc as per tender specification.**	
	Notes	
	• Contractor has to quote only in Rate Schedule Annexure-A. • The rates of different items for the entire scope shall be worked out & awarded as Per Annexure "B".	

"ANNEXURE-B"

Calculation ratio based upon the total value as per rate schedule at Annexure A:

S.No.	Description	% Allotted of Contract Value	Amount
1.0	**MAIN TURBINE**	**25.00**	**AX0.25**
2.0	**GENERATOR**	**7.00**	**AX0.07**
3.0	**Generator Auxiliaries**	**2.50**	**AX0.025**
4.0	**Replacement of rotor heating & studs heating line**	**2.00**	**AX0.02**
5.0	**Valves &Servomotor**	**5.00**	**AX0.05**
6.0	**Installation of EHG Mechanical**	**1.00**	**A X 0.01**
7.0	**Conventional valves**	**3.50**	**AX0.035**
8.0	**CONDENSER**.	**2.00**	**A X 0.02**
9.0	**Replacement of valves below 65 mm**	**2.00**	**A X 0.02**
10.0	**Lube Oil System**	**3.00**	**A X 0.03**
11.0	**Heat Exchangers**	**7.00**	**AX 0.07**
12.0	**Condensate extraction pumps, (3 Nos.)**	**2.00**	**A X 0.02**
13.0	**Boiler Feed Pumps (3 Nos.)**	**6.50**	**AX0.065**
14.0	**HP / LP Bypass System**	**4.00**	**A X 0.04**
15.0	**Replacement of Drip Pumps- 02 nos**	**0.50**	**A X 0.005**
16.0	**Insulation , Hangers & supports and Painting**	**7.00**	**A X 0.07**
17.0	**Other Miscellaneous work**	**5.00**	**AX0.05**
18.0	**Commissioning** (Payment for commissioning already covered in Milestone Payment)	**-**	
Note-: Further bifurcation of above percentages is as per "Scope of Work" as mentioned in "Chapter II :SCOPE OF WORK" of TCC Part-I			
19.0	**Milestones**	**15.00**	**A X 0.15**
Note-: Further bifurcation of above percentages for milestone is as per table given in Clause 8.3.2 (B) of Terms of Payment of TCC Part-I			

Rev 01
1st June 2012

TECHNICAL CONDITION OF CONTRACT (TCC)

(Document No. PS: MSX:TCC)

BHARAT HEAVY ELECTRICALS LIMITED

PART-II OF TCC

Bharat Heavy Electricals Limited
(A Govt. of India Undertaking)
Power Sector –Northern Region,
Plot No. 25, Sector-16 A,
Distt.GautamBudh Nagar, Noida-201301

TECHNICAL CONDITIONS OF CONTRACT VOL-II

TECHNICAL CONDITIONS OF CONTRACT VOL-II	
CHAPTER-I GENERAL GUIDELINES	
1.0	**GENERAL GUIDELINES**
1.1	The contractor shall carry out the work in accordance with standard practices / codes / instructions / drawings / documents / specification supplied by BHEL from time to time.
1.2	**BHEL-Power Sector(NR) is ISO 9001-2000, ISO 14001-1996, OHSAS 18001-1999, ISO 27001 and SA-8000 certified company. Quality of work, to customer's satisfaction and system requirements is the essence of these certifications. The contractor in all respects will organize his work, systems, environment, process control documentation, tools, plant, inspection, measuring and testing equipments etc. as per instructions of BHEL engineer**. **The contractor shall also comply with applicable legislation and regulations with regards to Health, Safety and Environmental aspects for minimizing risk arising from occupational health & safety hazards, controlling pollution and wastage. The Contractor will be responsible for Health, Safety & Environment management (HSE) at site for the construction activities to be carried out by them in accordance with requirements given under section I (a) of GCC and elsewhere in this tender document. The contractor, who is awarded the work, shall have to sign an MOU w.r.t implementation of HSE conditions with BHEL (Safe Work Practices).**
1.3	In order to meet the environmental concerns it is expected that the contractor shall plant, protect and maintain at least **100 trees** or equivalent in the vicinity of the project as per the available space and as per the advice of Engineers by contractor. In case no area is earmarked for tree plantation, the contractor may take up any other equivalent environment related project after due approval of the BHEL Engineer. In case, trees are not planted or other equivalent environment related project is not taken up by the contractor for any reason whatsoever, recovery at the rate of Rs. 200/- (Rupees two Hundred Only) per tree will be made from the final bill of the contractor.

CHAPTER-II **CIVIL WORKS, FOUNDATIONS AND GROUTING**

2.0	**CIVIL WORKS, FOUNDATIONS AND GROUTING**
2.1	Foundation and other necessary civil works for supporting structures, equipment etc, will be provided by UPRVUNL. The dimensions of the foundation and anchor bolt pits shall be checked by contractor for their correctness with respect to the above access as per the erection drawings. Further, top elevation column foundations shall be checked with respect to benchmark etc. All minor adjustments of foundation level, dressing & chipping of foundation surfaces for achieving the required elevation of the base of columns, enlarging the pocket of foundation etc., as may be required for the erection of equipment/ plants shall be carried by the contractor within quoted price. The foundation pockets shall be cleaned by using compressed air.
2.2	The contractor for their scope shall check the dimensions, level of the foundations, locations of pockets, pitch of anchor bolts and other inserts as per drawings. Further, top elevation of foundations shall be checked with respect to benchmark etc. All minor adjustments of foundation level, dressing and chipping of foundation surfaces up to 50 mm, enlarging the pockets in foundations etc., as may be required for the erection of equipment / plants shall be carried out by the contractor.
2.3	While on the job, care is essential to avoid too much chipping and resultant lowering of level. In case of excess chipping, contractor has to arrange additional packing plates as per requirements provided BHEL Engineer allows it. When required by manufacturers, the embedded sub-sole plates shall be scraped and checked with Prussian blue to get the required contact with frames.
2.4	The contractor shall ensure perfect matching of packer plates including machining, scraping and blue matching with foundation by dressing the foundation, as well as perfect matching between the packer plates and the base plate of equipment to the satisfaction of BHEL Engineer. If required the packer plates may have to be aligned and fixed on the foundations using approved quality special high strength, non-shrinking and quick-setting grouts. The minimum thickness below the packer plate should be 20 mm. The material required for this has to be arranged for by the contractor at his cost.

CHAPTER-III: **TOOLS AND PLANTS / IMTE's**

3.**0**	**TOOLS AND PLANTS / IMTE's**
3.1	Besides the T&P and IMTEs being made available to contractor free of hire charges by BHEL, all other T&Ps and IMTEs which are required for successful and timely execution of the work covered within the scope of this tender, shall be arranged and provided by the contractor. Indicative lists of T&Ps and IMTEs to be arranged by the contractor are given as per Annexure. He should ensure that these are in good working condition. In the event of the failure of contractor to bring necessary and sufficient T&Ps and IMTEs, BHEL will be at liberty to arrange the same and hire charges as applicable shall be deducted from contractor's bill. Decision of BHEL in this regard shall be final and binding on contractor.
3.2	All distribution boards, connecting cables, wire ropes, hoses, pipes etc, including temporary air / water / electrical connections etc shall have to be arranged by the contractor at his own cost.
3.3	The operation of all BHEL's/UPRVUNL T&P being provided free of hire charges shall be in the scope of the contractor. The contractor shall arrange at his own cost trained operators, fuel and other consumables for their operation. (Operators, fuel and other consumable for BHEL/UPRVUNL's 20/55/150/300 MT cranes, as per availability of crane is being used by contractor along with helpers shall be provided by contractor within the final accepted rates). All lubricants for these cranes & other BHEL T&Ps such as Mobil oil, gear oil, brake oil, hydraulic oil, torque converter oil & grease etc have to provide by contractor, as required during the work.
3.4	The contractor shall arrange at his cost all spares needed for upkeep of all T&Ps supplied by BHEL/UPRVUNL. For cranes, replacement of filter and repair of batteries, self, dynamo shall be the responsibility of the contractor.
3.5	All tools and tackles, machinery, equipment, instruments required for the work have to be arranged by the contractor including its transportation before and after work and including storage, insurance etc.
3.6	Contractor shall provide all the necessary scaffolding materials, temporary structures, as may be required and necessary safety devices etc.
3.7	The contractor shall arrange adequate nos. of wooden sleepers for material stacking near work site failing which BHEL may get the same done at their risk & cost.
3.8	The contractor has to maintain a logbook and shall furnish regular maintenance and utilization report of the BHEL T & P's under his possession, as per requirement of BHEL.

CHAPTER-IV: SUPERVISORY STAFF AND WORKMEN

4.0	**SUPERVISORY STAFF AND WORKMEN**
4.1	The work shall be executed under the usual conditions affecting major power plant construction and in conjunction with numerous other operations / activities at site. The contractor and his personnel shall cooperate with other personnel / contractors, coordinating his work with others and proceed in a manner that shall not delay or hinder the progress of work as a whole.
4.2	The contractor shall deploy the necessary number of qualified and approved full time electricians at his cost to maintain his temporary electrical installation till the completion of work.
4.3	During the course of erection, ➢ If the progress is found unsatisfactory, ➢ If the target dates fixed from time to time for every mile stones are to be advanced / not being met, ➢ If it is found that the skilled workmen like fitters, operators, technicians etc deployed are not sufficient, BHEL after giving reasonable opportunity to the contractor will induct on the work the required workmen in addition to contractor's workmen to improve the progress. The expenses so incurred will be recovered from the contractor's bills with overheads.
4.4	If the contractor or his workmen or employees shall break, deface, injure or destroy any part of a building, road kerb, fence, enclosure, water pipes, cables, drains, electric / telephone poles, wire, trees or any other property or to any part of erected components, the contractor shall make the same good at his own expense. In default, BHEL may cause the same to be made good by other workmen or by other means and deduct the expenses from any money due to the contractor. BHEL's decision will be final and binding.
4.5	Though every endeavor shall be made to ensure that all plant materials are supplied as per schedule. However in a job of this kind it is possible that some materials may be delayed. In order to achieve the ultimate targets, the contractor may have to augment his manpower and resources. No compensation on this account shall be admissible.
4.6	The month wise manpower deployment plan to be submitted as per format (at Annexure-C to General Conditions of Contract) is only to assess the capability as well as understanding of the contractor to execute the work. It shall be the contractor's responsibility to deploy the required manpower, for timely and successful completion of the job, to any extent over and above those indicated in the above deployment plan (including those which are not covered in the plan submitted) without any compensation on this account. The contractor shall identify separate persons at site for quality control and safety.

CHAPTER-V: ERECTION & WELDING

5.0	**ERECTION**
5.1	All normal erection and assembly techniques necessary for completion of works under this specification and magnitude have to be carried out. It is not possible to specifically list out all of them. Absence of any specific reference will not absolve the contractor of his responsibility for the particular operation. These would include, Scaffolding and rigging operations, Machine / flame / electric cutting, grinding, welding, radiography and stress relieving Fitting, fettling, filing, straightening, chamfering chipping, scrapping, reaming, as cleaning, checking, leveling, blue matching, aligning and assembly. Machining, surface grinding, drilling, doweling, shaping Temporary erections for alignment, dismantling of certain equipment for checking, cleaning, servicing and site fabrication.
5.2	Any fixtures, scaffolding materials, approach ladder, concrete block supports, steel structures required for temporary supporting, pre-assembly or checking, welding, lifting and handling during pre-assembly and erection shall be arranged by contractor at his cost.
5.3	No members of any ladder / structure / platform should be cut without specific approval of BHEL. In case it is necessary to cut, the contractor shall rectify / repair in a manner acceptable to BHEL / customer without any additional cost.
5.4	The contractor shall erect scaffolding / temporary platforms for erection. These should be of adequate capacity and shall never be over loaded. These should be replaced when not found suitable during erection work and dismantled on work completion and removed from work site.
5.5	It shall be the responsibility of the contractor to provide ladders on columns for initial work till such time stairways are completed. For this, the ladder should not be welded on the column and should be pre-fabricated clamping type ladders. No temporary welding on any structural member is permitted except under special circumstances with the approval of BHEL. In case it is absolutely necessary then the contractor shall cut the temporary structure and rectify the column as directed by the engineer
5.6	The contractor is strictly prohibited in using the Turbine/Auxiliary Components for any temporary supporting or scaffolding works etc. In case of such misuse a sum of determined by Engineer will be recovered from contractor's bills
5.7	The material for platform section shall be supplied in running meters. These shall be cut to size / shape / fabricated to required size / shape and to be welded by contractor.
5.8	Certain adjustment in length may be necessary while erecting pipelines/casings etc. The contractor should remove the extra lengths / add extra lengths to suit the final layout after preparing edges afresh by adopting specified heat treatment procedures.
5.9	The contractor shall carry out trial run of all motors including checking the direction of rotation in the uncoupled condition. Checking of alignment and re-coupling of the motor to the driven equipment as per instructions of BHEL engineer and to their satisfaction.
5.10	Some of the rotating equipment and electrical motors are provided with protective greases only. Contractor shall arrange for cleaning of the same with kerosene or some other reagent. If necessary, dismantling some of the parts of the equipment would be necessary. He shall arrange for re-greasing / lubricating them with recommended lubricants and for assembling back the dismantled parts, at quoted rate. Lubricants will, however, be supplied free of cost by BHEL.
5.11	After initial trial of rotating equipment, control and power cabling for motors and other equipment / instrumentation shall have to be disconnected for checking alignment and re-setting / re-alignment / hot alignment. Contractor shall have to arrange for disconnecting control and power cabling as per BHEL engineer's instructions and clearance and reconnect the control and power cabling after realignment. Quoted tonnage rate shall be inclusive of the above.
5.12	Packer plates supplied may have to be machined to the correct dimensions. It may also be necessary to blue match the same with each other/ with equipment / with foundations as per BHEL instructions
5.13	Contractor shall arrange changing of preservative oil in the gearboxes, journal and other bearing assemblies of rotating equipment when in storage areas or after erection of equipment as the case may be as per the instructions of BHEL engineer. Necessary lubricants / oil will be supplied by BHEL and the same will be drawn by contractor from BHEL / customer's stores and transporting to site. No additional payment will be made for such works even though supply of lube oil might have been made under regular dispatch-able unit (DU) number against product group main assembly (PGMA) and appearing in the

	shipping list. Prior to the commissioning of the equipment, oil should be drained and collected in drums provided by BHEL and returned to BHEL / customer's stores.
5.14	Whenever required the contractor shall arrange for pre-qualification of process task performers.
5.15	All rotating machines and equipment shall be cleaned, lubricated, checked for their smooth rotation, if necessary by dismantling and refitting before erection. If, in the opinion of Engineer, the equipment is to be checked for clearance, tolerance at any stage of work or during commissioning period, all such works are to be carried out by contractor at his cost.
5.16	All the shafts of rotating equipment shall be properly aligned to those of the matching equipment within design tolerances All bearings; shafts and other rotating parts shall be thoroughly cleaned and suitably lubricated before starting.
5.17	The contractor at no extra cost to BHEL shall carry out servicing and realignment of skid mounted equipment.
5.18	Certain instruments like pressure gauges, pressure transmitters, temperature gauges, flow switches and indicators, etc., are received in assembled condition as integral part of equipment. Contractor shall be responsible for safe receipt, installation and custody of these instruments supplied mounted on skids / equipment. The calibration of skid / equipment mounted instruments shall be arranged by contractor. The contractor shall arrange for removal, calibration and re-installation of the instruments. The contractor will maintain the list of all the instruments removed & reinstalled. Instruments prior to removal and after reinstallation shall be considered in custody of the contractor for this package. All instruments such as pressure gauges / temperature gauges, switches etc. forming part of product group (PG) are under the erection scope of this contract and shall be installed and commissioned by the contractor of this package at no extra cost to BHEL. However the calibration of these instruments shall be done by contractor as above.
5.19	All electrical panels, control gears, motors and such other devices shall be properly dried by heating to improve IR valve, before they are energized. Bearings, slip rings commutators and other exposed parts shall be protected against moisture ingress and corrosion during storage and periodically inspected.
5.20	It is possible that a few flanges may not be matching. The contractor shall be required to cut and re-weld the same as and when required without any additional cost.
5.21	All the actuators etc. shall be serviced and lubricated to the satisfaction of Engineer before erecting the same and during pre- commissioning also.
5.22	The Erection, testing and commissioning of all electrically operated valves, actuators and dampers is covered within the scope of this specification.
5.23	The sub-contractor shall carry out Dismantling, Removal, Shifting of any obstructing structures, pipe lines, **cables & cable trays, trench pipes, trenches, equipments,** facilities etc. as required including **restoration of the same on completion of work**. Any re routing of pipelines, cables and cable trays, trench pipes, trenches, equipments facilities etc, if required, shall be carried out by subcontractor free of cost.
5.24	All Necessary Preparation, Development, Barricading and Marking of the Area has to be made by the sub-contractor for Storage, Fabrication, and Pre Assembly & Erection of the Materials.
5a.0	**WELDING**
5a.1	Engineer may stop any welder from the work if his performance is unsatisfactory for any technical reason. The welder's is having passed qualification tests, does not absolve the contractor of contractual obligation to continuously check the welder's performance.
5a.2	Faulty welds caused by the poor workmanship shall be cut and re-welded at the contractor's expense. The Engineer prior to any repair being made shall approve the procedure for the repair of defective welds. After the repair has been carried out, the compliance shall be submitted to the quality engineer.
5a.3	All expenses for testing of contractor's welders including destructive and nondestructive tests conducted by BHEL at site or at laboratory shall have to be borne by the contractor only. Limited quantity of tube and pipe material required for making test pieces will be supplied by BHEL free of cost.
5a.4	The regulators used on welding machines shall be calibrated before putting these into use for work. The Contractor at his cost shall also arrange periodic calibration for the same.
5a.5	Only BHEL/CUSTOMER approved electrodes and filler wire will be arranged and used by the contractor, within the finally quoted price. BHEL reserves the right to test any approved electrode being used by the contractor. Testing charges for the same shall be borne by the contractor. All electrodes shall be baked and dried in the electric electrode-drying oven to the required temperature for the period specified by the Engineer before these are used in erection work. All welders shall have electrodes drying portable oven at the work spot. The electrodes brought to the site will have valid manufacturing test certificate. The test certificate should have a co-relation with the lot number / batch number given on electrode packets. No electrodes will be used in the absence of above requirement. The thermostat and thermometer of

	electrode drying oven will be also calibrated and test certificate from Govt. approved / accredited test house traceable to National / International standards will be submitted to BHEL before putting the oven in use. The contractor shall also arrange periodical calibration for the same.

6.0	**APPLICATION OF REFRACTORY AND INSULATION**
6.1	All attachment welding, including welding of hooks / supports as per pitch both on equipment shall be done as directed by Engineer. Attachment welding shall have to be done by certified welders. If necessary contractor may have to cut the hooks to correct length without any extra cost to BHEL.
6.2	Contractor has to supply and apply heat resistant primer on welded portions before application of insulation.
6.3	The mineral wool mattresses (bonded / un-bonded) / LRB mattresses are received at site in standard sizes. These are to be dressed / cut to suit site requirements by the contractor.
6.4	The number of layers / thickness of mineral wool / LRB mattresses for auxiliaries, pipe lines, valves and other vessels shall be as per various drawings and as directed by Engineer. For applying the mineral wool mattress, the required holding materials, if necessary by fabrication of rings/ hooks shall be fixed as directed and as per drawings and spec.
6.5	The contractor should ensure, proper finishing of surface of the insulation, sheeting and cementing.
6.6	The contractor should ensure that the finished surface of the insulation works conforms to the dimensions and tolerances given in the drawings. Aesthetic finish and accuracy of work are most important.
6.7	It is the responsibility of the contractor to ensure that the insulation materials and sheet metal covering issued to him for application are well protected against loss or damage from weather conditions. Closed / semi closed sheds or any other arrangements required for this will be made by him at his cost. If any damage occurs to the material due to improper storage or due to any causes attributable to the contractor except for normal breakage or damages allowed in such cases, the cost of such damaged material shall be to the account of the contractor.
6.8	Sheet cladding will be fabricated to the sizes and shapes specified in drawings. Beading, swaging, beveling of sheets, crowning the sheets will be carried out by him. Two coats of anti-corrosive black bituminous paint are to be applied on inner surfaces of the cladding. Bitumen sealing compound on the joints is included in the scope of this work. Contractor may note that they will also supply anti-corrosive black bituminous paint and bituminous sealing compound required for above works at his cost. However, if any material is received from the unit, the same shall be issued free of cost to the contractor
6.9	Sheet metal cladding over insulation will consists of plain / ribbed / corrugated sheets. The sheets will be supplied in standard sizes. Cutting them to required size, grooving, fabricating bends, boxes etc., for proper covering is contractor's responsibility. Any cutting / bending / welding of fabricated skin casing sheets if required will also be covered within the scope of this contract.
6.10	A logbook shall be maintained by the contractor to obtain clearance for application of insulation. If the contractor does the work on his own accord without prior permission the area may have to be redone at his cost.
6.11	Contractor is liable for the exact accounting of the material issued to him and he shall make any unaccountable losses good. Wastage allowances for the material issued are as below: 1. Wool / LRB mattresses and cladding sheets……2% 2. Insulation bricks and mortar…….…….. 2% 3. Cast able refractory…….…. 1%
6.12	The entire surplus, unused materials etc., supplied by BHEL shall be returned to BHEL after the work is over. Materials like gunny bags and packing materials, empty containers may be returned at periodical intervals.
6.13	The contractor shall leave certain gaps and opening while doing the work as per instructions of BHEL engineer to facilitate inspection during commissioning and to fix gauges, fittings and instruments. The gaps will have to be finished as per drawings at a later date by the contractor at his cost.
6.14	If during erection and commissioning any of the parts are to be temporarily fixed and then replaced by permanent ones at a later date or if any of the parts are to be removed for modification, rectification, adjustment and then refitted or if some parts are to be opened for inspection and checking and for measurement of metal surface temperature the same may necessitate removal and re-application of insulation and sheet metal cladding, which shall be done by the contractor and the erection rate quoted shall be inclusive of such contingencies.
6.15	Removable type of insulation shall be provided for valves, fittings, expansion joints etc as per the drawings or as directed by BHEL Engineer.
6.16	All temporary pipelines required during testing, pre-commissioning and commissioning should be insulated as directed by BHEL at no extra cost to BHEL. However required insulation material shall be issued by BHEL free of cost.

6.17	Insulation of expansion joints, dampers, etc shall be carried out after NDT / gas tightness test is completed.
6.18	Special type of Insulation wool used in pent house shall not be cut indiscriminately.
6.19	Contractor shall mix and apply the refractory / insulation as per the instructions of BHEL Engineer. Castable refractory / insulation after application shall be cured as per the instructions of BHEL Engineer. The contractor shall provide the required quantity of wire nails, planks for formwork and other materials for centering and grouting work.

CHAPTER-VII: **TESTING, PRE-COMMISSIONING, COMMISSIONING AND POST- COMMISSIONING.**

7.0	**TESTING, PRE-COMMISSIONING, COMMISSIONING AND POST- COMMISSIONING.**
7.1	The contractor shall carry out all the required tests and pre-commissioning and commissioning activities required for their successful and reliable operation. All required tests (Mechanical and electrical) indicated by BHEL and their clients for successful commissioning are included in the scope of these specifications. These tests / activities may not have been listed in these specifications. Specialized test equipment, if any, shall be provided by BHEL / its client free of hire charges. However contractor has to take proper care of the equipment issued to him. Commissioning of Turbine& Auxiliaries shall involve required activities such as Flushing, steam blowing, related testing, pre-commissioning, commissioning activities of lube oil system, governing oil, gas systems, TG vacuum system, water lines and other systems of Turbine, Generator, Condenser, BFP and other auxiliaries. This includes preparation for flushing (By steam & Oil), hydro-test, steam blowing, other cleaning activities, actual execution of the activities, normalization etc. The contractor shall provide all consumables, labor, scaffoldings and items required for satisfactory testing. All the tests may have to be repeated till all the equipment satisfy the requirement / obligation of BHEL at various stages. The contractor shall do all the repairs for site-welded joints arising out of the failure during testing.
7.2	The contractor may note that no separate payment shall be released for any temporary works that are to be carried out for conducting pre-commissioning and commissioning tests. Bidders are advised to include expenses on temporary works along with the rates being quoted by them. Broadly the work on temporary systems will be divided as under: Erection etc. Dismantling of the temporary equipment will be done by the agency that has erected the equipment. He will also return the equipment to the stores.
7.3	It shall be the responsibility of the contractor to provide various category of workers in sufficient numbers along with Supervisors during Pre-commissioning, commissioning and post commissioning of equipment and attending any problem in the equipment erected by the contractor till handing over. The contractor will provide necessary consumables, T&Ps, IMTEs etc., and any other assistance required during this period. Association of BHEL's / Client's staff during above period will not absolve contractor from above responsibilities.
7.4	It shall be specifically noted that the above employees of the contractor may have to work round the clock along with BHEL Engineers and hence overtime payment by the contractor to his employees may be involved. The contractors finally accepted rates should be inclusive of all these factors also.
7.5	In case, any rework is required because of contractor's faulty erection, which is noticed during pre-commissioning and commissioning, the same has to be rectified by the contractor at his cost. If any equipment / part is required to be inspected during pre-commissioning and commissioning, the contractor will dismantle / open up the equipment / part and reassemble / redo the work without any extra claim.
7.6	During commissioning, opening / closing of valves, changing of gaskets, realignment of rotating and other equipment, attending to leakage and adjustments of erected equipment may arise. The finally accepted price / rates shall also include all such work.
7.7	In case any defect is noticed during tests, trial runs and commissioning such as loose components, undue noise or vibration, strain on connected equipment etc., the contractor shall immediately attend to these defects and take necessary corrective measures. If any readjustment and realignment are necessary, the contractor at his cost shall do the same as per Engineer's instructions including repair, rectification and replacement work. The parts to be replaced shall be provided by BHEL.
7.8	At the time of each inspection, the contractor shall take note of the decisions / changes proposed by the Engineer and incorporate the same at no additional cost. The contractor shall carry out any other test as desired by BHEL Engineer/ Manufacturer on erected equipment covered under scope of this contract during testing and commissioning to demonstrate the physical completion of any part or parts of the work performed by the contractor

CHAPTER-VIII: FINAL PAINTING

8.0	**FINISH PAINTING**
8.1	The following Indian Standards may be referred to for carrying out the painting job: IS - 1303, 2379, 1477, 2524, 2395, 2338, 6278, 3140, 158, 2074, 104, and 2932.
8.2	All exposed metal parts of the equipment, structure, auxiliaries, piping, and other items (covered within the scope of this contract) after installations are to be painted. The surfaces are to be thoroughly cleaned of all dirt, rust, scales, grease, oils and other foreign materials by wire brushing, scrapping, any other method as per requirement of BHEL. The same will be inspected and approved by the engineer before painting.
8.3	Mostly the equipment / items/ components will be supplied with one coat of primer paint and one coat of finish paint. However during long storage and handling, the same may get peeled off / deteriorate. Before erecting the material it is essential that all such surfaces are to be thoroughly cleaned and to be touch up painted with suitable approved primer and finish paint matching with shop paint / approved final color. Besides above two coats of approved primer paint is to be applied on all the bare / unpainted surfaces. The gas cut stubs would require being ground and rounded.
8.4	After the surface is prepared, one coat of Zinc Phosphate primer conforming to IS: 2074 shall be applied. After first coat is dried up completely, second coat of red oxide primer shall be applied by brushing to ensure continuous film. The **dry film thickness** of each coat shall be **minimum 25 microns**.
8.5	Synthetic enamel paint conforming to IS: 2932 shall be used for finish coats. The color/ shade shall be as approved by the customer. After cleaning the dust on the dried up primer, first coat of synthetic enamel shall be applied. After this first coat dries up hard, the surface should be wet scrubbed cutting down to smooth finish and ensuring that at no place the first coat is completely removed. After applying second coat, allowing the water to get evaporated completely, third finish coat of painting shall be applied.
8.6	Certain equipment like control panels, valves etc. shall require spray painting. The contractor shall make arrangements of the required equipment for spray painting.
8.7	Painting and Marking/Labeling of the materials erected. Arrangement of paints is included in the Scope of Work of the Contractor within quoted rate.
8.8	After applying the primer paints, wherever required, all structure / equipment / items, shall be finish painted paints as specified by BHEL engineer. The number of coats / paint thickness shall be as indicted in drawing / documents. However at least two coats of finish painting is to be applied. In case proper finish is obtained in two coats, the contractor shall apply additional coat (s) till proper finish / paint thickness achieved. Certain equipment / Items are required to be painted with approved quality heat resistant pai primer. After completion of painting all bright spots shall be cleaned to the satisfaction of Engineer.
8.9	Contractor at no extra cost to BHEL shall supply all paints; primers, tools and other consumables including scaffolding materials required for finish painting. Paint is to be BHEL approved make only and painting should be as per color scheme and quality approved / specified by Engineer. Valid Test Certificate for the paint so supplied shall be made available before use of the same on work
8.10	The contractor may be required to fill up dents / marks by applying putty before final painting of equipment. All materials and arrangements have to be made within quoted lumpsum price/rates.
8.11	The contractor shall provide legends with direction of flow on equipment and piping in size specified by Engineer. Letter writing shall be done in Hindi / English or in both languages.
8.12	The painters have to undergo test and only qualified painters will be allowed to work.