

TENDER SPECIFICATION

NO: BHE/PW/PUR/ROI-TB/1167

RECEIPT / COLLECTION / LOADING / TRANSPORTATION OF MATERIALS FROM BHEL / CLINT'S STORES / STORAGE YARDS TO SITE OF WORK, UNLOADING, ERECTION, TESTING, COMMISSIONING OF **BALANCE WORKS** OF SURFACE CONDENSERS, STEAM TURBINES, TURBO BLOWERS, PUMPS & AUXILIARIES INCLUDING CONDENSATE EXTRACTION PUMPS, PIPINGS, APPLICATION OF THERMAL INSULATION, FINAL PAINTING, ASSISTANCE FOR PG TEST ETC. AND HANDING OVER OF 3 x TURBO BLOWER SET

AT

STEEL AUTHORITY OF INDIA LTD (SAIL)

ROURKELA STEEL PLANT, ROURKELA

DIST. SUNDERGARH, (ODISHA)

Part - I TECHNICAL BID

CONSISTING OF:

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



Bharat Heavy Electricals Limited
(A Government of India Undertaking)
Power Sector - Western Region
345-Kingsway, Nagpur-440001

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Tender Specification Issue Details

Tender Specification No: BHE/PW/PUR/ROI-TB/1167

RECEIPT / COLLECTION / LOADING / TRANSPORTATION OF MATERIALS FROM BHEL / CLINT'S STORES / STORAGE YARDS TO SITE OF WORK, UNLOADING, ERECTION, TESTING, COMMISSIONING OF **BALANCE WORKS** OF SURFACE CONDENSERS, STEAM TURBINES, TURBO BLOWERS, PUMPS & AUXILIARIES INCLUDING CONDENSATE EXTRACTION PUMPS, PIPINGS, APPLICATION OF THERMAL INSULATION, FINAL PAINTING, ASSISTANCE FOR PG TEST ETC. AND HANDING OVER OF 3 x TURBO BLOWER SET

AT

STEEL AUTHORITY OF INDIA LTD (SAIL)

ROURKELA STEEL PLANT, ROURKELA

DIST. SUNDERGARH, (ODISHA)

Part - I TECHNICAL BID

EARNEST MONEY DEPOSIT: Refer Notice Inviting Tender

LAST DATE FOR Refer Notice Inviting Tender
TENDER SUBMISSION

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

M/s.

.....

PLEASE NOTE:
THESE TENDER SPECS DOCUMENTS ARE NOT TRANSFERABLE.

For Bharat Heavy Electricals Limited

AGM (Purchase)

Place: Nagpur

Date:

1167

NOTICE INVITING TENDER

Bharat Heavy Electricals Limited



NOTICE INVITING TENDER (NIT)
NOTE: BIDDER MAY DOWNLOAD FROM WEB SITES
OR
PURCHASE TENDERS FROM THIS OFFICE ALSO

=====

To

Dear Sir/Madam

Sub : NOTICE INVITING 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.

1.0 Salient Features of NIT

SL NO	ISSUE	DESCRIPTION
i	TENDER NUMBER	BHE/PW/PUR/ROI-TB/1167
ii	Broad Scope of job	RECEIPT / COLLECTION / LOADING / TRANSPORTATION OF MATERIALS FROM BHEL / CLINT'S STORES / STORAGE YARDS TO SITE OF WORK, UNLOADING, ERECTION, TESTING, COMMISSIONING OF BALANCE WORKS OF SURFACE CONDENSERS, STEAM TURBINES, TURBO BLOWERS, PUMPS & AUXILIARIES INCLUDING CONDENSATE EXTRACTION PUMPS, PIPINGS, APPLICATION OF THERMAL INSULATION, FINAL PAINTING, ASSISTANCE FOR PG TEST ETC. AND HANDING OVER OF 3 x TURBO BLOWER SET AT STEEL AUTHORITY OF INDIA LTD (SAIL), ROURKELA STEEL PLANT, ROURKELA, DIST. SUNDERGARH, (ODISHA)
iii	DETAILS OF TENDER DOCUMENT	
a	Volume-IA	<i>Technical Conditions of Contract (TCC) consisting of Scope of work, Technical Specification, Drawings, Procedures, Bill of Quantities, Terms of payment, etc</i> <i>Applicable</i>
b	Volume-IB	<i>Special Conditions of Contract (SCC)</i> <i>Applicable</i>
c	Volume-IC	<i>General Conditions of Contract (GCC)</i> <i>Applicable</i>
d	Volume-ID	<i>Forms and Procedures</i>
e	Volume-II	<i>Price Schedule (Absolute value).</i> <i>Applicable</i>
iv	Issue of Tender	1. <u>Sale from BHEL PS WR office at NAGPUR :</u>

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	Documents	Start : 10/08/2013 Closes: 16/08/2013, Time : 16.00 Hrs 2. From BHEL website (www.bhel.com) Tender documents will be available for downloading from website till due date of submission	<i>Applicable/ Not applicable</i>
v	DUE DATE & TIME OF OFFER SUBMISSION	Date : 17/08/2013 , Time : 15.00 Hrs Place : BHEL PS Regional office at :Nagpur Tenders being submitted through representative shall be handed over to any of the following BHEL officials after making entry/registration at the reception: Pratish Gee Varghese/Engineer(Purchase) Nirmal P.G /Asst.Engineer (Pur)	<i>Applicable</i>
vi	OPENING OF TENDER	Date : 17/08/2013 , Time : 16.00 Hrs Notes: (1) In case the due date of opening of tender becomes a non-working day, then the due date & time of offer submission and opening of tenders get extended to the next working day. (2) Bidder may depute representative to witness the opening of tender	<i>Applicable</i>
vii	EMD AMOUNT	Rs 1,50,000/- (Rupees One Lakh and Fifty Thousand Only)	<i>Applicable</i>
viii	COST OF TENDER	Rs 2000/-.	<i>Applicable/Not Applicable</i>
ix	LAST DATE FOR SEEKING CLARIFICATION	Atleast 3 days before the due date of offer submission Along with soft version also, addressing to undersigned & to others as per contact address given below	<i>Applicable</i>
x	SCHEDULE OF Pre Bid Discussion (PBD)	NA	<i>Applicable/Not applicable.</i>
xi	INTEGRITY PACT & DETAILS OF INDEPENDENT EXTERNAL MONITOR (IEM)	NA	<i>Applicable/Not Applicable</i>
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) and not in the newspapers . Bidders to keep themselves updated with all such information	

- 2.0 The offer shall be submitted as per the instructions of tender document and as detailed in this NIT. Bidders to note specifically that all pages of tender document, including these NIT pages of this particular tender together with subsequent correspondences shall be submitted by them, duly signed & stamped on each page, as part of offer. **Rates/Price including discounts/rebates, if any, mentioned anywhere/in any form in the techno-commercial offer other than the Price Bid, shall not be entertained.**
- 3.0 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 Nagpur issuing the Tender, along with techno-commercial offer. Bidder may also choose to deposit the

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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 Nagpur, Sundays and second/ last Saturdays

- 4.0 Unless specifically stated otherwise, bidder shall deposit EMD through Demand Draft/Pay Order in favour of Bharat Heavy Electricals Ltd, payable at Nagpur. For other details and for 'One Time EMD' please refer General Conditions of Contract.
- 5.0 **Procedure for Submission of Tenders:** The Tenderers must submit their Tenders to Officer inviting Tender, as detailed below:
- PART-I consisting of 'PART-I A (Techno Commercial Bid)' & 'PART-I B (EMD/COST of TENDER)' in two separate sealed and superscribed envelopes (ENVELOPE-I & ENVELOPE-II)
 - PART-II (Price Bid) – in sealed and superscribed envelope (ENVELOPE-III)
 - One set of tender documents shall be retained by the bidder for their reference
- 6.0 The contents for ENVELOPES and the superscription for each sealed cover/Envelope are as given below. **(All pages to be signed and stamped)**

Sl no	Description	Remarks
	Part-I A	
	<p><u>ENVELOPE – I superscribed as :</u> PART-I (TECHNO COMMERCIAL BID) TENDER NO : NAME OF WORK : PROJECT: DUE DATE OF SUBMISSION:</p> <p><u>CONTAINING THE FOLLOWING:-</u></p>	
i.	Covering letter/Offer forwarding letter of Tenderer.	
ii.	<p>Duly filled-in 'No Deviation Certificate' as per prescribed format to be placed after document under sl no (i) above.</p> <p><u>Note:</u></p> <p>a. In case of any deviation, the same should be submitted separately for technical & commercial parts, indicating respective clauses of tender against which deviation is taken by bidder. The list of such deviation shall be placed after document under sl no (i) above. It shall be specifically noted that deviation recorded elsewhere shall not be entertained.</p> <p>b. BHEL reserves the right to accept/reject the deviations without assigning any reasons, and BHEL decision is final and binding.</p> <p style="padding-left: 20px;">i). In case of acceptance of the deviations, appropriate loading shall be done by BHEL</p> <p style="padding-left: 20px;">ii). In case of unacceptable deviations, BHEL reserves the right to reject the tender</p>	
iii.	<p>Supporting documents/ annexure/ schedules/ drawing etc as required in line with Pre-Qualification criteria.</p> <p>It shall be specifically noted that all documents as per above shall be indexed properly and credential certificates issued by clients shall distinctly bear the name of organization, contact ph no, FAX no, etc.</p>	
iv.	All Amendments/Correspondences/Corrigenda/Clarifications/Changes/ Errata	

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	etc pertinent to this NIT.	
v.	Integrity Pact Agreement (Duly signed by the authorized signatory)	If applicable
vi.	Duly filled-in annexures, formats etc as required under this Tender Specification/NIT	
vii.	Notice inviting Tender (NIT)	
viii.	Volume – I A : <u>Technical</u> Conditions of Contract (TCC) consisting of Scope of work, Technical Specification, Drawings, Procedures, Bill of Quantities, Terms of payment, etc	
ix.	Volume – I B : Special Conditions of Contract (SCC)	
x.	Volume – I C : General Conditions of Contract (GCC)	
xi.	Volume – I D : Forms & Procedures	
xii.	Volume – II (UNPRICED – without disclosing rates/price, but mentioning only 'QUOTED' or 'UNQUOTED' against each item	
xiii.	Any other details preferred by bidder with proper indexing.	

	PART-I B	
	<p><u>ENVELOPE – II superscribed as:</u> PART-I (EMD/COST of TENDER) TENDER NO : NAME OF WORK : PROJECT: DUE DATE OF SUBMISSION:</p> <p>CONTAINING THE FOLLOWING:-</p>	
i.	<p>1. Earnest Money Deposit (EMD) in the form as indicated in this Tender OR Documentary evidence for 'One Time EMD' with the Power Sector Region of BHEL floating the Tender</p> <p>2. Cost of Tender (Demand Draft or copy of Cash Receipt as the case may be)</p>	

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

	OUTER COVER	
	ENVELOPE-IV (MAIN ENVELOPE / OUTER ENVELOPE)	

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	superscribed as: TECHNO-COMMERCIAL BID, PRICE BID & EMD TENDER NO: NAME OF WORK: PROJECT: DUE DATE OF SUBMISSION: CONTAINING THE FOLLOWING:	
i	<ul style="list-style-type: none">○ Envelopes I○ Envelopes II○ Envelopes III	

SPECIAL NOTE : All documents/ annexures submitted with the offer shall be properly annexed and placed in respective places of the offer as per enclosure list mentioned in the covering letter. BHEL shall not be responsible for any missing documents.

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

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

9.0 Assessment of Capacity of Bidders:

Bidders 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 'Load' is the sum of the unit wise identified packages (refer Table-1) for contracts with BHEL Regions. The cut off month for reckoning 'Load' shall be the month, two (2) months preceding the month corresponding to the 'latest date of bid submission', in the following manner:

(Note: For example if latest bid submission is in Aug 2011, then the 'load' shall be calculated upto and inclusive of June 2011)

i). Total number of Packages

Total number of Packages in hand = P

Where

- 'P' is the sum of all unit wise identified packages under execution with BHEL Regions as of the cut off month defined above, including packages yet to be commenced, excepting packages which are on HOLD due to reasons not attributable to Bidder..

II. **PERFORMANCE:** Here 'Monthly Performance' of the bidder for all the packages (**under execution/** executed during the 'Period of Assessment' in all the 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 the cut off month. The cut off month for reckoning 'Period of Assessment' shall be the month two (2) months preceding the month corresponding to the 'latest date of bid submission', in the following manner:

(**Note:** For example if 'latest date of bid submission' is in Aug 2011, then the 'performance' shall be assessed for a 6 month period upto and inclusive of June 2011, for all the unit wise identified packages (refer Table I)

- i). Calculation of Overall 'Performance Rating' for 'similar Package/Packages' for the tendered scope under execution at Power Sector Regions for the 'Period of Assessment':
This shall be obtained by summing up the 'Monthly Performance Evaluation' scores obtained by the bidder in all Regions for all the similar Package/packages', divided by the total number of Package months for which evaluation should have been done, as per procedure below:
- a) $P_1, P_2, P_3, P_4, P_5, \dots, P_N$ etc be the packages (**under execution/** executed during the 'Period of Assessment' in all Regions) **SIMILAR** to the packages covered under the tendered scope, excepting packages not commenced. Total number of similar packages for all Regions = P_T (i.e $P_T = P_1 + P_2 + P_3 + P_4 + \dots + P_N$)
 - 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 ' T_T ' for total similar Packages ' P_T ' for all Regions (i.e $T_T = T_1 + T_2 + T_3 + T_4 + \dots + T_N$)
 - c) Sum ' S_1 ' of 'Monthly Performance Evaluation' Scores ($S_{1-1}, S_{1-2}, S_{1-3}, S_{1-4}, S_{1-5}, \dots, S_{1-N}$) for similar package P_1 , for the 'period of assessment' ' T_1 ' (i.e $S_1 = S_{1-1} + S_{1-2} + S_{1-3} + S_{1-4} + S_{1-5} + \dots + S_{1-N}$). 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 ' P_T ' for all Regions (i.e ' $S_T = S_1 + S_2 + S_3 + S_4 + S_5 + \dots + S_N$).
 - 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):

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

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

- 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 = P_T ie Sum (Σ) of columns (iii) to (ix)
2	Number of Months for which 'Monthly Performance Evaluation' as per relevant formats should have been	T_1	T_2	T_3	T_4	T_5	...	T_N	Sum (Σ) of columns (iii) to (ix) = T_T

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	done in the 'period of assessment for corresponding similar Package (as in row 1)								
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) = S _T

- ii) Calculation of Overall 'Performance Rating' (R_{BHEL}) in case '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.
- b) 12 months preceding the cut-off month
- c) 24 months preceding the cut-off month
- d) 36 months preceding 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 \leq 65	0.4
3	> 65 and \leq 70	0.35
4	> 70 and \leq 75	0.25
5	> 75 and < 80	0.2
6	\geq 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:

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- 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 $R_{BHEL} \geq 80$, 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 9.1)

IV. Explanatory note:

- a) Similar package means Boiler or ESP or Piping or Turbine or Civil or Structure or Electrical or CI, 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, CI, 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 (ie Boiler, ESP and Power Cycle Piping) and finally the Bidder's capacity to execute the tendered scope is assessed in line with III above
- b) Identified Packages (Unit wise)

Table-1

	Civil	Electrical & CI	Mechanical
	<ul style="list-style-type: none"> 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) 	<ul style="list-style-type: none"> i). Electrical ii). CI iii). Others (Elec & CI) 	<ul style="list-style-type: none"> i). Boiler & Aux (All types including CW Piping if applicable) ii). Power Cycle Piping/Critical Piping iii). LP Piping iv). ESP 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 Handling x). Material Management xi). Material Handling & Material Management xii). Others (Mechanical)

- c) Bidders who have not been evaluated for at least six package months in the last 36 months in the online BHEL system for contractor performance evaluation in BHEL PS Regions, wef July'2010 shall be considered "NEW VENDOR".

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

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

The "FIRST TIMER" tag shall remain till execution of work for a period of not less than 09 months, from the commencement of work of first package

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 'Capacity Evaluation of Bidders'.

- d) 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.
- e) 'Under execution' shall mean works in progress as per the following:
- i. up to Boiler Steam Blowing in case of Steam Generator and Auxiliaries
 - ii. upto Synchronisation in case of all other works excepting sl no (i) and (iii)
 - iii. Upto execution of at least 90% of anticipated contract value in case of Civil & Structures (unit wise), Enabling works and upto 90% of material unloading (in tonnage) as per the original contract in case of MM Package.

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

- f) 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

- 10.0 Since the job shall be executed at site, bidders must visit site/ work area and study the job content, facilities available, availability of materials, prevailing site conditions including law & order situation, applicable wage structure, wage rules, etc before quoting for this tender. They may also consult this office before submitting their offers, for any clarifications regarding scope of work, facilities available at sites or on terms and conditions.
- 11.0 For any clarification on the tender document, the bidder may seek the same in writing or through e-mail, as per specified format, within the scheduled date for seeking clarification, from the office of the undersigned. BHEL shall not be responsible for receipt of queries after due date of seeking clarification due to postal delay or any other delays. Any clarification / query received after last date for seeking clarification may not be normally entertained by BHEL and no time extension will be given.
- 12.0 BHEL may decide holding of pre-bid discussion [PBD] with all intending bidders as per date indicated in the NIT. The bidder shall ensure participation for the same at the appointed time, date and place as may be decided by BHEL. Bidders shall plan their visit accordingly. The outcome of pre-bid discussion (PBD) shall also form part of tender.
- 13.0 In the event of any conflict between requirement of any clause of this specification/ documents/drawings/data sheets etc or requirements of different codes/standards specified, the same to be brought to the knowledge of BHEL in writing for clarification before due date of seeking clarification (whichever is applicable), otherwise, interpretation by BHEL shall prevail. Any typing error/missing pages/ other clerical errors in the tender documents, noticed must be pointed out before pre-bid meeting/submission of offer, else BHEL's interpretation shall prevail.
- 14.0 Unless specifically mentioned otherwise, bidder's quoted price shall deemed to be in compliance with tender including PBD.

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- 15.0 Bidders shall submit Integrity Pact Agreement (Duly signed by authorized signatory who signs in the offer), **if applicable**, along with techno-commercial bid. This pact shall be considered as a preliminary qualification for further participation. **The names and other details of Independent External Monitor (IEM) for the subject tender is as given at point (1) above.**
- 16.0 The Bidder has to satisfy the Pre Qualifying Requirements stipulated for this Tender in order to be qualified. The Price Bids of only those bidders will be opened who will be qualified for the subject job on the basis of satisfying the Pre Qualification Criteria specified in this NIT as per Annexure-I (as applicable), past performance etc. and date of opening of price bids shall be intimated to only such bidders. BHEL reserves the right not to consider offers of parties under HOLD.
- 17.0 In case BHEL decides on a 'Public Opening', the date & time of opening of the sealed PRICE BID shall be intimated to the qualified bidders and in such a case, bidder may depute one 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.
- 18.0 Validity of the offer shall be for **six months** from the latest due date of offer submission (including extension, if any) unless specified otherwise.
- 19.0 BHEL reserves the right to decide the successful bidder on the basis of Reverse Auction process. In such case all qualified bidders will be intimated regarding procedure/ modality for Reverse Auction process prior to Reverse Auction and price will be decided as per the rules for Reverse Auction. .
- However, if reverse auction process is unsuccessful as defined in the RA rules/procedures, or for whatsoever reason, then the sealed 'PRICE BIDS' will be opened for deciding the successful bidder. BHEL's decision in this regard will be final and binding on bidder.
- 20.0 On submission of offer, further consideration will be subject to compliance to tender & qualifying requirement and customer's acceptance, as applicable.
- 21.0 In case the bidder is an "Indian Agent of Foreign Principals", 'Agency agreement has to be submitted along with Bid, detailing the role of the agent along with the terms of payment for agency commission in INR, along with supporting documents.
- 22.0 The bidders shall not enter into any undisclosed M.O.U. or any understanding amongst themselves with respect to tender.
- 23.0 Consortium Bidding (or Technical Tie up) shall be allowed only if specified in Pre Qualifying Requirement (PQR) criteria, and in such a case the following shall be complied with:
- 23.1 Prime Bidder and Consortium Partner or partners are required to enter into a consortium agreement 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

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- 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
- 24.0 The bidder shall submit documents in support of possession of 'Qualifying Requirements' duly self certified and stamped by the authorized signatory, indexed and properly linked in the format for PQR. In case BHEL requires any other documents/proofs, these shall be submitted immediately.
- 25.0 The bidder may have to produce original document for verification if so decided by BHEL.
- 26.0 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

AGM (Purchase)

Enclosure

01. Annexure-1: Pre Qualifying criteria.
 02. Annexure-2: Check List .
 - 03 Annexure-4- Important Information
- Other Tender documents as per this NIT.

PRE QUALIFYING REQUIREMENTS

JOB	RECEIPT / COLLECTION / LOADING / TRANSPORTATION OF MATERIALS FROM BHEL / CLINT'S STORES / STORAGE YARDS TO SITE OF WORK, UNLOADING, ERECTION, TESTING, COMMISSIONING OF BALANCE WORKS OF SURFACE CONDENSERS, STEAM TURBINES, TURBO BLOWERS, PUMPS & AUXILIARIES INCLUDING CONDENSATE EXTRACTION PUMPS, PIPINGS, APPLICATION OF THERMAL INSULATION, FINAL PAINTING, ASSISTANCE FOR PG TEST ETC. AND HANDING OVER OF 3 x TURBO BLOWER SET AT STEEL AUTHORITY OF INDIA LTD (SAIL), ROURKELA STEEL PLANT, ROURKELA, DIST. SUNDERGARH, (ODISHA)
TENDER NO	BHE/PW/PUR/ROI-TB/1167

SL NO	PRE QUALIFICATION CRITERIA	Bidders claim in respect of fulfilling the PQR Criteria	
		Name and Description of qualifying criteria	Page no of supporting document. Bidder must fill up this column as per applicability
A	Submission of Integrity Pact duly signed (if applicable) (Note: To be submitted by Prime Bidder & Consortium/Technical Tie up partner jointly in case Consortium bidding is permitted, otherwise by the sole bidder)	NOT APPLICABLE FOR THIS TENDER	
B	Technical Bidder must have executed any one of the following in last seven years as on latest date of bid submission: B.1) Erection, Testing and Commissioning of atleast One Unit of STG/GTG job of any rating. <p style="text-align: center;">OR</p> B.2) Erection, Testing and Commissioning of atleast One BOILER upto synchronization (with Rotating machinery) unit rating 30 MW or higher, under direct order of BHEL <p style="text-align: center;">OR</p> B.3) One R&M job of Steam Turbines of capacity 50 MW or higher <p style="text-align: center;">OR</p> B.4) Atleast three number capital overhauling work of STGs against BHEL direct orders. The rating of individual STG unit shall be atleast 190MW	APPLICABLE	

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C-1	Financial TURNOVER Bidders must have achieved an average annual financial turnover (Audited) of Rs.17 Lakhs or more over last three Financial Years (FY) i.e. 2010-2011,2011-2012 and 2012-2013 OR 2009-10, 2010-11 & 2011-12 in case Accounts for FY 2012-13 has not been audited.	APPLICABLE	
C-2	NETWORTH (only in case of Companies) Net worth of the Bidder based on the latest Audited Accounts as furnished for 'C-1' above should be positive	APPLICABLE	
C-3	PROFIT Bidder must have earned cash profit in any one of the three Financial Years as applicable in the last three Financial Years defined in 'C-1' above based on latest Audited Accounts.	APPLICABLE	
D	Assessment of Capacity of Bidder to execute the work as per sl no 9 of NIT (if applicable)	Applicable	By BHEL
E	Approval of Customer (if applicable) Note: Names of bidders (including consortium/Technical Tie up partners in case consortium bidding is permitted) who stand qualified after compliance of criteria A to D shall be forwarded to customer for their approval.	Not Applicable	BY BHEL
F	Price Bid Opening Note: Price Bids of only those bidders shall be opened who stand qualified after compliance of criteria A to E	APPLICABLE	BY BHEL
F	Consortium criteria (if applicable)	Not Applicable	
<p><u>Explanatory Notes for the PQR (unless otherwise specified in the PQR):</u></p> <ol style="list-style-type: none"> Bidder to submit Audited Balance Sheet and Profit and Loss Account for the respective years as indicated against C-1 above along with all annexures In case audited Financial statements have not been submitted for all the three years as indicated against C-1 above, then the applicable audited statements submitted by the bidders against the requisite three years, will be averaged for three years i.e total divided by three. C-2:-NETWORTH : Shall be calculated based on the latest Audited Accounts as furnished for C-1 above. Net worth = Paid up share capital + Reserves. (Net worth is required to be evaluated in case of companies) C-3:- PROFIT : shall be NET profit (PAT + Non cash expenditure viz depreciation) earned during any one of the three financial years as in C-1 above 'Additional' Criteria in respect of 'Technical' criteria of PQR (as in 'B' above) for Civil, Electrical, CI, unless otherwise specified:- <ol style="list-style-type: none"> Bidder should have executed similar work of any one of the following: <ol style="list-style-type: none"> One (1) work of value not less than Rs XXX OR Two (2) works of not less than Rs YYY OR Three (3) works of not less than Rs ZZZ (Value XXX, YYY, ZZZ shall be as indicated by BHEL 'Similar' work for criteria 5 above means <ol style="list-style-type: none"> Civil or Structures or Civil & Structures or Chimney respectively as applicable to the tendered scope in respect of 'CIVIL' Works Electrical works in respect of 'ELECTRICAL' 			

	<p style="text-align: center;">c. CI works in respect of 'CI' Works d. Material Handling and/or Management works in respect of 'MM' works</p> <p>6. Time period for achievement of the 'Technical' criteria of PQR (as in 'B' above) will be the last 7 years ending on the 'latest date' of Bid submission</p> <p>7. 'EXECUTED' means the Vendor should have achieved the criteria specified in the Technical criteria of PQR (as in 'B' above) even if the Contract has not been completed or closed</p> <p>8. Unless otherwise specified, for the purpose of 'Technical' criteria of PQR (as in 'B' above), the word 'EXECUTED' means:</p> <ol style="list-style-type: none">1. "BOILER LIGHT UP" in respect of Boiler & Aux and ESP2. "SYNCHRONISATION" in respect of STG/GTG and 'SPINNING' in case of HTG3. "STEAM BLOWING COMPLETION" in respect of at least Main Steam Line of Power Cycle Piping4. "HYDRAULIC TEST" of the system in respect of Structures, Pressure parts/IBR Piping5. "CHARGING" in respect of power Transformers, Bus ducts, HT/LT switchgears6. "Completion of RCC Shell and liner (steel or brick as per tendered scope) up to the HEIGHT specified using slip form" in case of RCC Chimney.7. Achievement of physical Quantities as per respective PQRs in respect of Civil & Structures and Piling Works8. "Readiness for coal Filling" in respect of Bunker Structure Work. <p>9. Boiler means HRSG or WHRB or any other types of Steam Generator</p> <p>10. Critical/Power Cycle piping means Main Steam, Hot Reheat, Cold Reheat, HP Bypass, LP Bypass lines</p> <p>11. For the purpose of evaluation of the PQR, one MW shall be considered equivalent to 3.5TPH 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 in terms of MW shall be considered for evaluation.</p> <p>12. In case the experience/PO/WO certificate enclosed by bidders do not have separate break up prices for the E&C portion of Electrical and CI Works, (i.e. the certificates enclosed are for composite order for supply and erection of Electrical & CI and other works if any), then value of Erection and Commissioning for the Electrical & CI portion shall be considered as 15% of the supply & erection of Electrical & CI, unless otherwise specifically indicated in the PQR.</p> <p>13. Scope for capital overhaul of STG shall cover Bearing Inspection work and overhauling of all cylinders of the Turbine unless otherwise specifically indicated in the PQR.</p> <p>14. In case the tendered scope is not a Pulverised Fuel Boiler, experience of Oil/Gas Fired Boilers also can be considered unless otherwise specifically indicated in the PQR.</p>
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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.

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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: <u>Please tick (✓) whichever applicable:-</u> ONE TIME EMD / ONLY FOR THIS TENDER	
5	Validity of Offer	TO BE VALID FOR SIX MONTHS FROM DUE DATE	
		APPLICABILITY(B Y 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	YES/NO
8	Copy of PAN Card	Applicable	YES/NO
9	Whether all pages of the Tender documents including annexures, appendices etc are read understood and signed	Applicable	YES/NO
10	Integrity Pact	Not Applicable	Not Applicable
11	Declaration by Authorised Signatory	Applicable	YES/NO
12	No Deviation Certificate	Applicable	YES/NO
13	Declaration confirming knowledge about Site Conditions	Applicable	YES/NO
14	Declaration for relation in BHEL	Applicable	YES/NO
15	Non Disclosure Certificate	Applicable	YES/NO
16	Bank Account Details for E-Payment	Applicable	YES/NO

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17	Capacity Evaluation of Bidder for current Tender	Applicable	YES/NO
18	Tie Ups/Consortium Agreement are submitted as per format	Not Applicable	YES/NO
19	Power of Attorney for Submission of Tender/Signing Contract Agreement	Applicable	YES/NO
20	Analysis of Unit rates	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

IMPORTANT INFORMATION

1. The offers of the bidders who are on the banned list as also the offer of the bidders, who engage the services of the banned firms, shall be rejected. The list of banned firms is available on BHEL web site (www.bhel.com --->Tender Notification - List of Banned Firms)
2. All Statutory Requirements as applicable for this project shall be complied with.
3. Please take note of following Revised Tender Clauses:
 - i. Notice Inviting Tender: SI No 9
 - ii. General conditions of Contract: Clause No 1.15.13 (New), Clause No 2.8.3, 2.8.4 and 2.8.5
4. The works under this tender specification are the balance works withdrawn from the existing sub contractor. Hence the offer from whom the works have been withdrawn under Contract No 715 shall not be considered for the subject tender.
5. Price Variation Clause (PVC) as per GCC shall not be applicable.

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TECHNICAL CONDITIONS OF CONTRACT (TCC)

BHARAT HEAVY ELECTRICALS LIMITED



TECHNICAL CONDITIONS OF CONTRACT (TCC) CONTENTS

SL NO	DESCRIPTION	CHAPTER	NO. OF PAGES
VOLUME-IA	PART-I: CONTRACT SPECIFIC DETAILS		
1	PROJECT INFORMATION	CHAPTER-I	1
2	SCOPE OF WORKS	CHAPTER-II	8
3	FACILITIES IN THE SCOPE OF CONTRACTOR/BHEL (SCOPE MATRIX)	CHAPTER-III	7
4	T&PS AND MMES TO BE DEPLOYED BY CONTRACTOR	CHAPTER-IV	1
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6	TIME SCHEDULE	CHAPTER-VI	2
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9	SPECIFIC EXCLUSION	CHAPTER-X	1
10	TENTATIVE LIST OF PACKAGES, WEIGHT DETAILS, DIMENSIONS ETC OF EQUIPMENTS/SYSTEM	CHAPTER-X	6
11	PAINTING SCHEME	CHAPTER-XI	1
12	Erection Testing and Commissioning of STG (TURBO BLOWER)	CHAPTER-XII	29

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter - I: Project Information

1.0	Project Information
	<p>INTROCUCTION</p> <p>Customer Steel Authority of India Ltd (SAIL) is having one of their Steel Plant at Rourkela dist Sundergarh, Orissa, India. Customer is setting up 3 X Turbo Blower station (PKG 012) under their 4.2 Mtpa Crude Steel expansion programme at Rourkela Steel Plant, Rourkela. The site is inside the premises of existing Rourkela Steel Plant. The maximum and minimum temperature variation in the area is about above 44 Degree Centigrade & below 10 Degree Centigrade respectively.</p> <p>APPROACH TO SITE</p> <p>Nearest Railway station : Rourkela Railway station is approx 4 KM from Rourkela Steel Plan .</p> <p>Access to site by Road : Rourkela to Ranchi NH-23</p> <p>Nearest Airport : Bhubaneshwar Airport is approx 450 KM from site.</p>

BIDDERS ARE ADVISED TO ACQUAINT THEMSELVES WITH SITE LOCATION, WORKING CONDITIONS IN AND AROUND THE PROJECT PREMISES & LOCAL PREVAILING SITUATIONS PRIOR TO SUBMITTING THEIR OFFER. NO CLAIM FOR COMPENSATION WILL BE ENTERTAINED ON THE GROUNDS OF NON-FAMILIARITY WITH THE SITE CONDITION & WORKING CONDITIONS ETC. ALL COSTS FOR AND ASSOCIATED WITH SITE VISITS SHALL BE BORNE BY THE BIDDER.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter - II: Scope of Works

1.0 SCOPE OF WORK

BIDDERS ARE REQUESTED TO SPECIFICALLY NOTE THE FOLLOWING:

THE WORK FOR TURBO-BLOWER 1, 2 & 3 WAS UNDER EXECUTION BY OTHER AGENCY AND SOME OF THE WORKS HAVE BEEN COMPLETED. TURBO BLOWER 1 AND 2 HAVE BEEN COMMISSIONED WITH SOME BALANCE WORKS LEFT OUT. BALANCE WORKS ARE BEING WITHDRAWN/ ISOLATED FROM THE SCOPE OF PREVIOUS AGENCY DUE TO UNAVOIDABLE REASONS. SUCCESSFUL BIDDER HAS TO UNDERGO FOR JOINT MEASUREMENTS IN PRESENCE OF BHEL REPRESENTATIVES AT SITE BEFORE TAKING OVER THE SITE FOR COMPLETION OF SUCCESSIVE WORKS & FREEZE THE CUT-OFF POINT OF OLD CONTRACT.

AS THIS BEING A WITHDRAWN WORK FROM OTHER AGENCY, BIDDERS ARE REQUESTED TO HAVE PRE-BID VISIT/ INSPECTION OF SITE TO MAKE THEM FULLY ACQUAINTED WITH THE ACTUAL STATUS OF WORK, SITE SITUATION & NATURE OF JOB. NO CLAIM SHALL BE ENTERTAINED AT LATER DATE ON ACCOUNT OF NON-FAMILIARIZATION OF SITE CONDITION. BIDDERS MAY FIX UP THEIR SITE VISIT IN CONSULTATION WITH CONSTRUCTION MANAGER BHEL SITE OFFICE SAIL ROURKELA. NAME, ADDRESS & CONTACT POINT OF SITE IS AS BELOW:

SHRI G K UPADHAYA
CONSTRUCTION MANAGER
BHEL SITE OFFICE – SAIL, ROUREKELA
MOB: 08763432346

THE SCOPE OF WORK OF THIS TENDER SPECIFICATION FOR COLLECTION OF MATERIALS FROM BHEL / CLINT'S STORES / STORAGE YARDS TO SITE OF WORK, UNLOADING, ERECTION, TESTING, COMMISSIONING OF BALANCE WORKS (DETAILED IN CLAUSE 2.1) OF SURFACE CONDENSERS, STEAM TURBINES, TURBO BLOWERS, PUMPS & AUXILIARIES INCLUDING CONDENSATE EXTRACTION PUMPS, PIPINGS, APPLICATION OF THERMAL INSULATION, FINAL PAINTING, ASSISTANCE FOR PG TEST ETC. AND HANDING OVER OF 3 x TURBO BLOWER SET AT STEEL AUTHORITY OF INDIA LTD (SAIL), ROURKELA STEEL PLANT, ROURKELA, DIST. SUNDERGARH, (ODISHA)

- 1) COLLECTION OF MATERIALS FROM BHEL/CLIENT'S STORES/STORAGE YARD; TRANSPORTATION TO SITE, ERECTION, TESTING & ASSISTANCE FOR COMMISSIONING, TRIAL OPERATION AND HANDING OVER OF TURBO BLOWER, INSULATION, FINAL PAINTING ETC.
- 2) PRE-ASSEMBLY/ASSEMBLY, PRE-ERECTION CHECKS AS PER REQUIREMENT.
- 3) ERECTION, ALIGNMENT, TESTING, COMMISSIONING OF EQUIPMENTS / SYSTEMS WITH ASSOCIATED AUXILIARIES AND STAGE INSPECTION BY STATUTORY AUTHORITIES LIKE BOILER INSPECTOR, FACTORY INSPECTOR ETC. COVERED UNDER THIS TENDER SPECIFICATION. ALL THE NECESSARY TESTS INCLUDING SUPPLY OF TESTING / MEASURING EQUIPMENTS & INSTRUMENTS SHALL BE CARRIED OUT AS PER REQUIREMENT UNDER THIS SCOPE OF TENDER SPECIFICATION.
- 4) CHIPPING/ BLUE-MATCHING OF CIVIL FOUNDATION, GROUTING OF EQUIPMENTS/ AUXILIARIES / PANELS WITH PORTLAND AND NON-SHRINK READY-MIX GROUTING CEMENT

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TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter - II: Scope of Works

AS PER NORMAL ENGINEERING PRACTICE FOR SIMILAR EQUIPMENTS. CONTRACTOR SHALL ARRANGE ALL THE GROUT MATERIALS OF BHEL-APPROVED BRAND WITHIN THE QUOTED PRICE.

- 5) PRE-ASSEMBLY, STAGE INSPECTION AS PER REQUIREMENT OF BHEL / CUSTOMER / IBR AND OTHER STATUTORY AUTHORITIES, ERECTION, ALIGNMENT, HEAT TREATMENT, STRESS RELIEVING, WELDING, RADIOGRAPHY & OTHER NDT TESTS, FLUSHING/CHEMICAL CLEANING, HYDRAULIC TESTING, STEAM BLOWING OF PIPING INCLUDING IMPULSE PIPING.
- 6) ERECTION, COLD SETTING AND HOT SETTING OF PIPING SUPPORTS & HANGERS.
- 7) APPLICATION OF THERMAL INSULATION & CLADDING OF APPLICABLE PIPING, VESSELS & EQUIPMENTS AS APPLICABLE.
- 8) CHEQUERED PLATES AND STRUCTURAL STEEL WILL BE SUPPLIED FREE OF CHARGES BY BHEL/ CLIENT FOR COVERING VARIOUS OPENINGS IN THE TURBINE FLOOR. THE CONTRACTOR HAS TO CUT THESE TO REQUIRED SIZE AND FIX AT APPROPRIATE LOCATIONS INCLUDING RAISED SUPPORTS ETC TO FILL THE GAPS AROUND THE TURBO BLOWER SET FOUNDATIONS SHALL BE CARRIED BY CONTRACTOR. NO SEPARATE PAYMENT IS ENVISAGED FOR THIS ACTIVITY.
- 9) ERECTION OF ELECTRICAL MOTORISED & CONTROL VALVES
- 10) FINAL PAINTING OF ERECTED ITEMS
- 11) ERECTION, PRE-COMMISSIONING & COMMISSIONING CHECKS/TESTS AND COMMISSIONING INCLUDING TRIAL RUN OPERATION OF APPLICABLE EQUIPMENTS AND AUXILIARIES.
- 12) TRIAL OPERATION OF TURBO BLOWER SETS, FINAL PAINTING, PROVIDING ASSISTANCE DURING PG TEST OF THE EQUIPMENTS AND HANDING OVER OF THE UNIT TO BHEL'S CLIENT.
- 13) COMPLETION OF ALL FACILITIES/SYSTEMS

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter - II: Scope of Works

2.1 – DETAILS OF WORK

2.1.1 - TURBO BLOWER 1 –

AREA	MAJOR BALANCE WORKS	SCOPE DETAILS
PIPES SUPPORTS	PERMANENT SUPPORTS OF LUBE OIL PIPINGS & TURBINE INTEGRAL PIPINGS	SHIFTING OF REQUIRED MATERIALS FROM BHEL STORE TO SITE REMOVAL OF TEMPORARY SUPPORTS, IF ANY. FIXING OF PERMANENT SUPPORTS INCLUDING HANGERS ETC WHEREVER APPLICABLE
PAINTING	FINAL PAINTING OF EQUIPMENTS/SYSTEMS	SHIFTING OF REQUIRED MATERIALS FROM BHEL STORE TO SITE PAINTING OF EXPOSED SURFACES OF THE EQUIPMENTS (EXCEPT SUPPLY OF PAINTS) AS PER SPECIFICATION
COMMISSIONING	COMMISSIONING ASSISTANCE	COMMISSIONING ASSISTANCES (ROUND-THE-CLOCK) WITH SKILLED HELPERS & SUPERVISOR AND WITH ALL NECESSARY T&P AND CONSUMABLES LIKE DIESEL/PETROL/GREASE/ CLOTHS FOR TURBO-BLOWER & ITS ACCESSORIES OPERATION VIZ. ROLLING, TRIAL RUN & PG TEST
	TRIAL RUN	
	PG TEST ASSISTANCE	

2.1.2 - TURBO BLOWER 2 –

AREA	MAJOR BALANCE WORKS	SCOPE DETAILS
PIPES SUPPORTS	PERMANENT SUPPORTS OF LUBE OIL PIPINGS & TURBINE INTEGRAL PIPINGS	SHIFTING OF REQUIRED MATERIALS FROM BHEL STORE TO SITE REMOVAL OF TEMPORARY SUPPORTS, IF ANY. FIXING OF PERMANENT SUPPORTS INCLUDING HANGERS ETC WHEREVER APPLICABLE
PAINTING	FINAL PAINTING OF EQUIPMENTS/SYSTEMS	SHIFTING OF REQUIRED MATERIALS FROM BHEL STORE TO SITE PAINTING OF EXPOSED SURFACES OF THE EQUIPMENTS (EXCEPT SUPPLY OF PAINTS) AS PER SPECIFICATION
COMMISSIONING	COMMISSIONING ASSISTANCE	COMMISSIONING ASSISTANCES (ROUND-THE-CLOCK) WITH SKILLED HELPERS & SUPERVISOR AND WITH ALL NECESSARY T&P AND CONSUMABLES LIKE DIESEL/PETROL/GREASE/ CLOTHS FOR TURBO-BLOWER & ITS ACCESSORIES OPERATION VIZ. ROLLING, TRIAL RUN & PG TEST
	TRIAL RUN	
	PG TEST ASSISTANCE	

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Chapter - II: Scope of Works

2.1.3 - TURBO BLOWER 3 –

AREA	MAJOR BALANCE WORKS	SCOPE DETAILS
CONDENSER	WELDING & NDT OF CONDENSER TOP CONNECTING PIECE WITH TURBINE	SHIFTING OF REQUIRED MATERIALS FROM BHEL STORE TO SITE WELDING & NDT OF CONDENSER TOP CONNECTING PIECE WITH TURBINE
	ERECTION & WELDING OF SS BELLOWS OF CONDENSER	ERECTION & WELDING OF SS BELLOWS OF CONDENSER
	CONDENSER FILL TEST & HYDRAULIC OF COLLER/SLEEVE	CONDENSER PLACED ON POSITION, TUBING COMPLETED SHIFTING OF REQUIRED MATERIALS FROM BHEL STORE TO SITE FIXING/WELDING OF CONDENSER & HOTWELL ACCESSORIES VIZ. DRAIN VALVES, ISOLATION VALVES, TAPPING POINTS FOR INSTRUMENTS ETC. FIXING/WELDING OF CONDENSER DOORS (FRONT & REAR) WITH HINGES SUPPORTS, SEALING GASKETS ETC.. CONDENSER BASE FRAMES GROUTING (INCLUDING SUPPLY OF GROUTING MATERIALS) PROVISION FOR 24" ARV PIPELINES CONNECTING CONDENSER WALL ARRANGEMENTS FOR CONDENSER WATER FILL TEST. ARRANGEMENTS FOR CONDENSER TUBES HYDRO TEST, TUBES EXPANSION, IF REQUIRED.
TURBINE	PLACEMENT OF TURBINE ON FOUNDATION & LEVELLING	TURBINE AVAILABLE AT TURBINE FLOOR. PLACEMENT OF TURBINE ON FOUNDATION & LEVELLING WITH BASE PLATES
	ALIGNMENT OF TURBINE	ALIGNMENT OF TURBINE WITH BLOWER & CONDENSER
	GROUTING OF TURBO-BLOWER FONDATION BASE FRAME (INCLUDING SUPPLY OF GROUTING MATERIALS)	GROUTING OF TURBO-BLOWER FONDATION BASE FRAME (INCLUDING SUPPLY OF GROUTING MATERIALS)
	FIXING & ASSEMBLY OF TURBINE ESV & CONTROL VALVE	SHIFTING OF REQUIRED MATERIALS FROM BHEL STORE TO SITE. FIXING & ASSEMBLY OF TURBINE ESV, CONTROL VALVE & ITS ACCESSORIES

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter - II: Scope of Works

	ASSEMBLY OF TURBINE REGULATION SYSTEM & BARRING AND GOVERNING CONSOL	ERECTION & ASSEMBLY OF TURBINE REGULATION SYSTEM & BARRING AND GOVERNING CONSOL
	TURBO-VISORY WORKS	TURBO-VISORY WORKS INCLUDING ROTOR ZERO & FLOAT TEST.
BLOWER	ALIGNMENT OF TURBO-BLOWER WITH TURBINE	ALIGNMENT OF TURBO-BLOWER WITH TURBINE AS PER M/S MANTURBO (BLOWER SUPPLIER) GUIDANCE
	COUPLING OF TURBINE WITH TURBO-BLOWER	COUPLING OF TURBINE WITH TURBO-BLOWER FIXING OF COUPLING GUARD AND ARRANGEMENT FOR ITS DRAIN.
	FINAL BOX UP OF BEARINGS OF TURBO-BLOWER	
LUBE OIL PIPING	ERECTION OF LUBE OIL PIPINGS WITH VALVES, WITH SUPPORTS & FITTINGS	<p>SHIFTING OF REQUIRED MATERIALS FROM BHEL STORE TO SITE.</p> <p>ALL PIPINGS ERECTION ARE TO BE DONE WITH NECESSARY SUPPORTS, INSTRUMENTS TAPPING POINTS INCLUDING ISOLATION VALVES, STUBS, THERMOWELLS ETC. AS PER THE DRAWING ALONGWITH OPERATING PLATFORMS FOR INSTRUMENTS & VALVES OPERATION.</p> <p>OIL VAPOUR EXTRACTION PIPINGS ERECTION INCLUDING 02 SETS OF EXTRACTION FANS, CS VALVES/NRVS/SEPARATOR/FITTINGS ETC, WELDING. [APPROX. QTY: 8 MTRS. OF 3" CS PIPES].</p> <p>TURBINE LUBE OIL SS PIPINGS ERECTION INCLUDING VALVES/CVS/MOVS/BELLOWS, FLOW GLASS/FITTINGS ETC, ARGON WELDING, NDT TESTS ETC. FOR CONNECTING TURBINE & ALL ITS L.O. ACCESSORIES VIZ. OIL TANKS, FILTERS, CENTRIFUGE, PUMPS, COOLERS ETC.</p>

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter - II: Scope of Works

	<p>ERECTION OF CONTROL & GOVERNING ETC. OIL PIPINGS WITH VALVES, SUPPORTS & FITTINGS</p>	<p>[APPROX. QTY: 85 MTRS. OF 4" SS PIPES, 60 MTRS. OF 3" SS PIPES, 40 MTRS. OF 1/2" SS PIPES, 50 MTRS. OF 3/4" SS PIPES, 40 MTRS. OF 1" SS PIPES, 20 MTRS. OF 6" SS PIPES, 4 MTRS. OF 8" SS PIPES, 15 MTRS. OF 10" SS PIPES & 20 MTRS. OF 2" SS PIPES].</p> <p>DRAIN/CONTROL OIL PIPINGS ERECTION INCLUDING VALVES/FITTINGS ETC, ARGON WELDING, NDT TESTS ETC. [APPROX. QTY: 25 MTRS. OF 2" SS PIPES, 45 MTRS. OF 1.5" SS PIPES & 20 MTRS. OF 6" SS PIPES].</p> <p>JACKING OIL PIPINGS ERECTION INCLUDING VALVES/FITTINGS ETC, ARGON WELDING, NDT TESTS ETC. [APPROX. QTY: 30 MTRS. OF 1" SS PIPES, 30 MTRS. OF 3/4" SS PIPES & 20 MTRS. OF 6" SS PIPES].</p> <p>CENTRIFUGE PIPINGS ERECTION INCLUDING VALVES/FITTINGS ETC, ARGON WELDING, NDT TESTS ETC. [APPROX. QTY: 40 MTRS. OF 1/2" SS PIPES].</p> <p>MOT, OHOT, DOT WATER FILL TEST, MANUAL CLEANING ETC.</p>
<p>TURBINE INTEGRAL/ CONDENSATE PIPING</p>	<p>ERECTION OF TURBINE EXTRACTION & INTEGRAL AND CONDENSER ARV PIPINGS WITH VALVES, SUPPORTS & FITTINGS</p>	<p>2 NOS. CEPS PLACED ON POSITION, THESE ARE TO BE LIFTED FOR GASKET FIXING, AGAIN PLACING ON POSITION WITH PROPER LEVELLING.</p> <p>SHIFTING OF REQUIRED MATERIALS FROM BHEL STORE TO SITE</p> <p>CEPS (2 NOS.) COOLING, QUENCHING LINES, SEALING LINES AND ITS ASSEMBLIES ERECTION.</p> <p>ALL PIPINGS ERECTION ARE TO BE DONE WITH NECESSARY SUPPORTS, INSTRUMENTS TAPPING POINTS INCLUDING ISOLATION VALVES, STUBS, THERMOWELLS ETC. AS PER THE DRAWING ALONGWITH OPERATING PLATFORMS FOR INSTRUMENTS & VALVES OPERATION.</p> <p>ERECTION OF 24" ARV PIPELINES (APPROX. 20 MTRS.), VALVE WITH NECESSARY SUPPORTING ARRANGEMENTS.</p> <p>TURBINE DRAIN PIPINGS ERECTION INCLUDING VALVES/MOVS/FITTINGS ETC, WELDING, TESTING INCLUDING NDT, RT, SR ETC, FLUSHING ETC. [APPROX. QTY: 60 MTRS. OF 1" P11 PIPES & 12 MTRS. OF 6" P11 PIPES].</p>

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter - II: Scope of Works

		<p>TURBINE GLAND STEAM PIPINGS ERECTION INCLUDING VALVES/CVS/MOVS/FITTINGS ETC, WELDING, FLUSHING ETC. [APPROX. QTY: 20 MTRS. OF 2" CS PIPES & 20 MTRS. OF 3" CS PIPES & 20 MTRS. OF 6" CS PIPES & 10 MTRS. OF 1" CS PIPES].</p> <p>TURBINE EXHAUST SPRAY PIPINGS ERECTION INCLUDING VALVES/SOVS/FITTINGS ETC, WELDING, FLUSHING ETC. [APPROX. QTY: 30 MTRS. OF 1/2" CS PIPES & 30 MTRS. OF 1" CS PIPES].</p> <p>TURBINE GLAND STEAM CONDENSER PIPINGS ERECTION INCLUDING VALVES/ELBOWS/BENDS/FITTINGS ETC, WELDING, FLUSHING ETC. [APPROX. QTY: 30 MTRS. OF 6" CS PIPES].</p> <p>STEAM JET AIR EJECTOR PIPINGS ERECTION INCLUDING VALVES/ELBOWS/BENDS/FITTINGS ETC, WELDING, ROTAMETER FIXING, FLUSHING ETC. [APPROX. QTY: 20 MTRS. OF 6" CS PIPES, 5 MTRS. OF 3" CS PIPES & 60 MTRS. OF 2" CS PIPES].</p> <p>CONDENSATE PIPING I.E. HOTWELL EXTRACTION, CEPS SUCTION & DISCHARGE PIPINGS ERECTION INCLUDING VALVES/ELBOWS/BENDS/FITTINGS ETC, WELDING, FLUSHING ETC. [APPROX. QTY: 40 MTRS. OF 6" CS PIPES & 30 MTRS. OF 3" CS PIPES].</p> <p>ALL VALVES SEALING ARRANGEMENT PIPINGS.</p>
PAINTING	FINAL PAINTING OF EQUIPMENTS/SYSTEMS	SHIFTING OF REQUIRED MATERIALS FROM BHEL STORE TO SITE PAINTING OF EXPOSED SURFACES OF THE EQUIPMENTS (EXCEPT SUPPLY OF PAINTS) AS PER SPECIFICATION
COMMISSIONING	COMMISSIONING ASSISTANCE - OIL FLUSHING	COMMISSIONING ASSISTANCES (ROUND-THE-CLOCK) WITH SKILLED HELPERS & SUPERVISOR AND WITH ALL NECESSARY T&P AND CONSUMABLES LIKE DIESEL/PETROL/GREASE/ CLOTHS FOR TURBO-BLOWER & ITS ACCESSORIES OPERATION VIZ. BARRING GEAR ACTIVITY, ROLLING, TRIAL TUN & PG TEST
	COMMISSIONING ASSISTANCE - REGULATION SYSTEM & BARRING GEAR	
	ROLLING COMMISSIONING ASSISTANCE	
	TRIAL RUN	
	PG TEST ASSISTANCE	

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter - II: Scope of Works

2.1.3 – OTHER WORKS

AREA	MAJOR BALANCE WORKS	SCOPE DETAILS
INSULATION	INSULATION OF TURBINE INTEGRAL PIPINGS & COLD BLAST PIPING	SHIFTING OF REQUIRED MATERIALS FROM BHEL STORE TO SITE. INSULATION OF COLD BLAST & TURBIN INTEGRAL PIPINGS INCLUDING CLADDING, ACOUSTICS ETC. AS PER THE SPECIFICATION. [APPROX. QTY. - 25 MT]

TECHNICAL CONDITIONS OF CONTRACT (TCC)
Chapter – III: Facilities in the scope of Contractor/BHEL

Sl. No	Description	Scope / to be taken care by		Remarks
		BHEL	Bidder	
3.1	PART I ESTABLISHMENT			
3.1.1	FOR CONSTRUCTION PURPOSE:			
a	Open space for office (as per availability)	Yes		Location will be finalized after joint survey with owner
b	Open space for storage (as per availability)	Yes		Location will be finalized after joint survey with owner
c	Construction of bidder's office, canteen and storage building including supply of materials and other services		Yes	
d	Bidder's all office equipments, office / store / canteen consumables		Yes	
e	Canteen facilities for the bidder's staff, supervisors and engineers etc		Yes	
f	Fire fighting equipments like buckets, extinguishers etc		Yes	
g	Fencing of storage area, office, canteen etc of the bidder		Yes	
3.1.2	FOR LIVING PURPOSES OF THE BIDDER			
a	Open space for labour colony (as per availability)		Yes	

TECHNICAL CONDITIONS OF CONTRACT (TCC)
Chapter – III: Facilities in the scope of Contractor/BHEL

Sl. No	Description PART I	Scope / to be taken care by		Remarks
		BHEL	Bidder	
b	Labour Colony with internal roads, sanitation, complying with statutory requirements		Yes	
3.2.0	ELECTRICITY			
3.2.1	Electricity For construction purposes of Voltage 415/440 V			FREE
a	Single point source	Yes		At a distance of 500 M from site (Distance is only estimated, it may vary upto an extent depending on site condition)
b	Further distribution including all materials, Energy Meter, Protection devices and its service		Yes	
c	Duties and deposits including statutory clearances if applicable		Yes	
3.2.2	Electricity for the office, stores, canteen etc of the bidder			FREE
a	Single point source		Yes	
b	Further distribution including all materials, Energy Meter, Protection devices and its service			NA

TECHNICAL CONDITIONS OF CONTRACT (TCC)
Chapter – III: Facilities in the scope of Contractor/BHEL

Sl. No	Description PART I	Scope / to be taken care by		Remarks
		BHEL	Bidder	
c	Duties and deposits including statutory clearances if applicable		Yes	
3.2.3	Electricity for living accommodation of the bidder's staff, engineers, supervisors etc			
a	Single point source		Yes	
b	Further distribution including all materials, Energy Meter, Protection devices and its service		Yes	
c	Duties and deposits including statutory clearances if applicable		Yes	
3.3.0	WATER SUPPLY			
3.3.1	For construction purposes:			FREE
a	Making the water available at single point	Yes		In case of inadequate supply / non-availability of construction water from customer, contractor shall have to arrange construction water at his own expenses.
b	Further distribution as per the requirement of work including supply of materials and execution		Yes	
3.3.2	Water supply for bidder's office, stores, canteen etc.			
a	Making the water available at single point		Yes	

TECHNICAL CONDITIONS OF CONTRACT (TCC)
Chapter – III: Facilities in the scope of Contractor/BHEL

Sl. No	Description	Scope / to be taken care by		Remarks
		BHEL	Bidder	
b	Further distribution as per the requirement of work including supply of materials and execution			NA
3.3.3	<u>Water supply for Living Purpose</u>			
a	Making the water available at single point		Yes	
b	Further distribution as per the requirement of work including supply of materials and execution		Yes	
3.4.0	LIGHTING			
a	For construction work (supply of all the necessary materials) 1. At office/storage area 2. At the preassembly area 3. At the construction site /area		Yes	
b	For construction work (execution of the lighting work/ arrangements) 1. At office/storage area 2. At the preassembly area 3. At the construction site /area		Yes	
c	Providing the necessary consumables like bulbs, switches, etc during the course of project work		Yes	

TECHNICAL CONDITIONS OF CONTRACT (TCC)
Chapter – III: Facilities in the scope of Contractor/BHEL

Sl. No	Description PART I	Scope / to be taken care by		Remarks
		BHEL	Bidder	
d	Lighting for the living purposes of the bidder at the colony / quarters		Yes	
3.5.0	COMMUNICATION FACILITIES FOR SITE OPERATIONS OF THE BIDDER			
a	Telephone, fax, internet, intranet, e-mail etc.		Yes	
3.6.0	COMPRESSED AIR wherever required for the work	YES		
3.7.0	Demobilization of all the above facilities		YES	
3.8.0	TRANSPORTATION			
a	For site personnel of the bidder		Yes	
b	For bidder's equipments and consumables (T&P, Consumables etc)		Yes	

TECHNICAL CONDITIONS OF CONTRACT (TCC)
Chapter – III: Facilities in the scope of Contractor/BHEL

SI. No	Description PART II 3.9.0 ERECTION FACILITIES	Scope / to be taken care by		Remarks
		BHEL	Bidder	
3.9.1	Engineering works for construction:			
a	Providing the erection drawings for all the equipments covered under this scope	Yes		
b	Drawings for construction methods	Yes	Yes	In consultation with BHEL
c	As-built drawings – where ever deviations observed and executed and also based on the decisions taken at site- example – routing of small bore pipes		YES	"
d	Shipping lists etc for reference and planning the activities	Yes		"
e	Preparation of site erection schedules and other input requirements		Yes	"
f	Review of performance and revision of site erection schedules in order to achieve the end dates and other commitments	Yes	Yes	"
g	Weekly erection schedules based on SL No. e		Yes	"
h	Daily erection / work plan based on SL No. g		Yes	"

TECHNICAL CONDITIONS OF CONTRACT (TCC)
Chapter – III: Facilities in the scope of Contractor/BHEL

SI. No	Description PART II 3.9.0 ERECTION FACILITIES	Scope / to be taken care by		Remarks
		BHEL	Bidder	
i	Periodic visit of the senior official of the 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 months.		Yes	
j	Preparation of preassembly bay		Yes	
k	Laying of racks for gantry crane if provided by BHEL or brought by the contractor/bidder himself		Yes	
L	Arranging the materials required for preassembly		Yes	

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter – IV: T&Ps and MMEs to be deployed by Contractor

- 1) ALL THE TOOLS AND PLANTS REQUIRED FOR THIS SCOPE OF WORK, EXCEPT THE TOOLS & PLANTS PROVIDED BY BHEL ARE TO BE ARRANGED BY CONTRACTOR WITHIN THE QUOTED RATES.
- 2) IF THE WORKS GET DELAYED DUE TO NON-AVAILABILITY OF T&P, BHEL RESERVES THE RIGHT TO GET THE WORK DONE AT THE RISK AND COST OF CONTRACTOR WITHIN PREJUDICE TO RIGHTS OF BHEL AS IN GCC.

MEASURING AND MONITORING DEVICES (MMD):

AS PER REQUIREMENT TO BE FINALIZED AT SITE, SHALL MEET THE REQUIREMENTS AS PER FIELD QUALITY PLAN AND OTHER ERECTION, TESTING RELATED ACTIVITIES.

TECHNICAL CONDITIONS OF CONTRACT (TCC)
Chapter – V: T&Ps and MMEs to be deployed by BHEL on sharing basis

SN	DESCRIPTION AND CAPACITY OF T&P	REMARKS
01	EOT CRANE- 01 NO. (60 / 10 T CAPACITY)	FOR HANDLING AND ERECTION WITHIN TG HALL ON SHARING BASIS AS AVAILABLE AND SUBJECT TO THEIR ACCESSIBILITY AND APPROACHABILITY

NOTE:

1. CUSTOMER WILL PROVIDE THE EOT CRANE, HOWEVER CONTRACTOR WILL HAVE TO PROVIDE THE EOT CRANE OPERATOR FOR HIS OPERATIONS AND WILL CARRY OUT THE DAY TODAY OPERATIONAL MAINTENANCE, GENERAL CLEANLINESS, ATTENDING OF GEAR BOX LEAKAGES ETC., APPLYING CALADIUM COMPOUND ON SLINGS AND HOLDING/SUPPORTING THE SUPPLY CABLES ETC. AS PART OF SCOPE OF WORK
2. EOT CRANES WILL BE USED ON SHARING BASIS BY OTHER AGENCIES WORKING WITHIN THE TG HALL UNDER THE INSTRUCTION OF BHEL. CONTRACTOR HAS TO PLAN HIS ACTIVITIES WELL IN ADVANCE AND INFORM BHEL ENGINEER IN CHARGE/ CONSTRUCTION MANAGER THE DATE OF ACTUAL USE.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter – VI: Time Schedule

6.1 TIME SCHEDULE & MOBILISATION

6.1.1 INITIAL MOBILIZATION

AFTER RECEIPT OF FAX LOI, CONTRACTOR SHALL DISCUSS WITH PROJECT MANAGER / CONSTRUCTION MANAGER REGARDING INITIAL MOBILIZATION. CONTRACTOR SHALL MOBILIZE NECESSARY RESOURCES WITHIN 1 WEEK OF ISSUE OF FAX LETTER OF INTENT OR AS PER THE DIRECTIVE OF PROJECT MANAGER / CONSTRUCTION MANAGER. SUCH RESOURCES SHALL BE PROGRESSIVELY AUGMENTED TO MATCH THE SCHEDULE OF MILESTONES AND COMMISSIONING.

6.1.2 MOBILIZATION FOR ERECTION, TESTING, ASSISTANCE FOR COMMISSIONING ETC.

THE ACTIVITIES FOR ERECTION, TESTING ETC. SHALL BE STARTED AS PER DIRECTIONS OF CONSTRUCTION MANAGER OF BHEL. CONTRACTOR SHALL MOBILIZE FURTHER RESOURCES (IN ADDITION TO THOSE REQUIRED FOR ACTIVITIES UNDER CLAUSE NO. 6.1.1) AS PER REQUIREMENT TO COMMENCE THE WORK OF ERECTION, TESTING ETC. OF TURBO BLOWERES AND PROGRESSIVELY AUGMENT THE RESOURCES TO MATCH SCHEDULE OF THE PROJECT.

6.1.3 COMMENCEMENT OF CONTRACT PERIOD AND TENTATIVE SCHEDULE

ERECTION/PLACEMENT ON ITS DESIGNATED FOUNDATION / LOCATION, OF THE FIRST MAJOR PERMANENT EQUIPMENT / COMPONENT / COLUMN COVERED IN THE SCOPE OF THESE SPECIFICATIONS SHALL BE RECOGNIZED AS “**START OF CONTRACT PERIOD**” FOR ERECTION, TESTING, ASSISTANCE FOR COMMISSIONING ETC “. SMALLER ITEMS LIKE PACKER PLATES, SHIMS, ANCHORS, INSERTS ETC. WILL NOT BE CONSIDERED AS START OF CONTRACT PERIOD.

THE CONTRACTOR HAS TO SUBSEQUENTLY AUGMENT HIS RESOURCES IN SUCH A MANNER THAT FOLLOWING MAJOR MILESTONES OF ERECTION & COMMISSION ARE ACHIEVED ON SPECIFIED SCHEDULES:

ACTIVITY	SCHEDULE OF COMPLETION
COMPLETION OF BALANCE WORK OF UNIT 1 & 2	WITHIN 4 WEEKS FROM START OF ERECTION
LIFTING & PLACEMENT OF STEAM TURBINE ON FOUNDATION OF TURBO BLOWER 3	WITHIN 2 WEEKS FROM START OF ERECTION
ALIGNMENT OF TURBO- BLOWER & TURBINE COUPLING OF TURBO BLOWER 3.	WITHIN 4 WEEKS FROM START OF ERECTION
PIPING WORKS COMPLETION OF TURBO BLOWER 3	WITHIN 5 WEEKS FROM START OF ERECTION

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter – VI: Time Schedule

OIL FLUSHING COMPLETION OF TURBO BLOWER 3	WITHIN 8 WEEKS FROM START OF ERECTION
INSULATION WORKS COMPLETION OF TURBO BLOWER 3	WITHIN 8 WEEKS FROM START OF ERECTION
BARRING GEAR OPERATION OF TURBO BLOWER 3	WITHIN 9 WEEKS FROM START OF ERECTION
ROLLING & READINESS WITH TURBO-BLOWER OF TURBO BLOWER 3	WITHIN 10 WEEKS FROM START OF ERECTION
TRIAL OPERATION COMPLETION OF TURBO BLOWER 3	WITHIN 11 WEEKS FROM START OF ERECTION
COMPLETION OF ALL FACILITIES AND PG TEST OF TURBO BLOWER 3	WITHIN 12 WEEKS FROM START OF ERECTION

IN ORDER TO MEET ABOVE SCHEDULE IN GENERAL, AND ANY OTHER INTERMEDIATE TARGETS SET, TO MEET CUSTOMER/ PROJECT SCHEDULE REQUIREMENTS, CONTRACTOR SHALL ARRANGE & AUGMENT ALL NECESSARY RESOURCES FROM TIME TO TIME ON THE INSTRUCTIONS OF BHEL.

THE CONTRACT PERIOD FOR COMPLETION OF ENTIRE WORK UNDER THIS SCOPE SHALL BE **3 (THREE MONTHS)** FROM THE “**START OF CONTRACT PERIOD**” FOR ERECTION, TESTING, ASSISTANCE FOR COMMISSIONING ETC” AS SPECIFIED EARLIER.

THE PERIOD FROM THE COMMENCEMENT OF PREPARATORY WORK FOR ERECTION TILL THE ACTUAL “START OF CONTRACT PERIOD” SHALL NOT BE RECKONED FOR THE ABOVE PURPOSE.

TECHNICAL CONDITIONS OF CONTRACT (TCC)
Chapter-VII: Terms of payments

7.1) PROGRESSIVE PAYMENT FOR ITEM 1 OF RATE SCHEDULE

1. Completion of Balance work of Turbo Blower 1 (12 %)		
SN	Description	%
1.1	Completion of Pipe Supports	2
1.2	Final painting of equipments/systems	7
1.3	Trial operation completion	1.5
1.4	PG Test Assistance	1.5
2. Completion of Balance work of Turbo Blower 2 (13 %)		
2.1	Completion of Pipe Supports	3
2.2	Final painting of equipments/systems	7
2.3	Trial operation completion	1.5
2.4	PG Test Assistance	1.5
3. Completion of Balance work of Turbo Blower 3 (75 %)		
3.1	Surface Condenser (5%)	
3.1.1	Welding & NDT of top connecting piece with turbine	2.0
3.1.2	Erection of SS bellows and welding of collar/sleeve	1.0
3.1.3	Water fill test & Hydraulic test of condenser	2.0
	Sub Total of 3.1	5.0
3.2	Steam Turbine (25%)	
3.2.1	Placement of turbine on foundation and levelling	7.0
3.2.2	Alignment of turbine with Turbo-Blower.	3.0

TECHNICAL CONDITIONS OF CONTRACT (TCC)
Chapter-VII: Terms of payments

3.2.3	Reaming and Coupling of Turbine	3.0
3.2.4	Fixing and assembly of Steam Admission & Control Valves	2.0
3.2.5	Assembly of regulation system and Governing Console	3.0
3.2.6	Turbo-visory work s completion	2.0
3.2.7	Final boxing up of bearing pedestals	3.0
3.2.8	Misc. equipments / Aux.	2.0
	Sub Total of 3.2	25.0
3.3	Turbo Blower (15 %)	
3.3.1	Alignment of Turbo- Blower & Steam Turbine	4.0
3.3.2	Reaming and Coupling of Turbo-Blower	3.0
3.3.4	Grouting of Turbo Blower foundation base plates/ base frame	5.0
3.3.5	Final Box up of Bearings of Turbo-Blower	3.0
	Sub Total of 3.3	15.0
3.4	Lube Oil system, Integral piping, Pumps and Other Auxiliaries (10 %)	
3.4.1	Erection of lube oil piping with valves, supports & fittings	7.0
3.4.2	Erection of Control Piping & Governig system with valves, supports & fittings etc.	1.0
3.4.3	Erection of Extraction piping with valves & fittings etc.	1.0
3.4.4	Erection of misc. auxiliaries	1.0
	Sub Total of 3.4	10.0
3.5	Final Painting (7%)	
3.5.1	Final painting of equipments/systems	7.0
	Sub Total of 3.5	7.0

TECHNICAL CONDITIONS OF CONTRACT (TCC)
Chapter-VII: Terms of payments

3.6	Commissioning & PG Test Assistance (13%)	
3.6.1	Oil flushing	3.0
3.6.2	Steam blowing completion and Connection of steam admission pipe	2.0
3.6.3	Barring Gear operation	2.0
3.6.4	Commissioning of condensate system	1.0
3.6.5	Rolling and Readiness of Turbo-Blower	2.0
3.6.6	Trial operation completion	1.5
3.6.7	PG Test Assistance	1.5
	Sub Total of 3.6	13.0
	Total of 3	75.0
	Total for item no-1 of Rate Schedule (1+2+3)	100.0

7.2 PROGRESSIVE PAYMENT FOR ITEM 2 OF RATE SCHEDULE (Insulation & Cladding)

Sl.	Part of Activity Completed	Percentage Of Accepted Item Rates
7.2.1	Transport to work site & Erection / Placement in position	95%
7.2.2	PG Test Completion	5%
	Total	100%

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter-VIII: Taxes and Other Duties

TAXES, DUTIES, LEVIES

8.0 TAXES, DUTIES, LEVIES (Consolidated Rev 03 dated 09/04/2013)

8.1. For All types of works excepting works covered under sl no 8.2

8.1.1

The contractor shall pay all (save the specific exclusions as enumerated in this contract) taxes, fees, license charges, deposits, duties, tools, royalty, commissions or other charges which may be levied on the input goods & services consumed and output goods & services delivered in course of his operations in executing the contract. In case BHEL is forced to pay any of such taxes, BHEL shall have the right to recover the same from his bills or otherwise as deemed fit.

However, provisions regarding Service Tax and Value Added Tax (VAT) on output services and goods shall be as per following clauses.

8.1.2 Service Tax & Cess on Service Tax

Contractor's price/rates shall be exclusive of Service Tax and Cess on Services. In case, it becomes mandatory for the contractor under provisions of relevant act/law to collect the Service Tax & Cess from BHEL and pay the same to the concerned tax authorities, such applicable amount will be paid by BHEL at the prevailing Service Tax Rate (presently 12.36 %) on the admitted bill value.

Contractor shall submit to BHEL documentary evidence of Service Tax registration certificate specifying name of services covered under this contract. Contractor shall submit serially numbered Service Tax and Cess Invoice, signed by him or a person authorized by him in respect of taxable service provided, and shall contain the following, namely,

- 1. The name, address and the registration number of the contractor,**
- 2. The name and address of the party receiving taxable service,**
- 3. Description, classification and value of taxable service provided and,**
- 4. The service tax payable thereon.**

All the Four conditions shall be fulfilled in the invoice before release of service tax payment.

Wherever, more than one route/option are available for discharge of service tax liability under a particular service, (e.g. "works contract Service"), contractor shall obtain prior written consent from BHEL site before billing the amount towards Service Tax.

8.1.3 VAT (Sales Tax /WCT)

As regards Value Added Tax (VAT)/CST on transfer of property in goods involved in Works Contract (previously known as Works Contract Tax) applicable as per local laws, the price quoted by the contractor shall be inclusive of the same and in no case input or output VAT/CST will be reimbursed extra.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter-VIII: Taxes and Other Duties

In any case the Contractor shall register himself with the respective Sales Tax authorities of the state and submit proof of such registration to BHEL along with the first RA bill. Contractor will submit all the details of VAT/CST paid for the contract in the prescribed format of the respective state VAT laws. Also, the contractor will issue the tax Invoices to BHEL as per the Tax laws of respective state on monthly basis. Contractor shall also be required to furnish to BHEL necessary proof of VAT remittance on monthly basis.

Deduction of tax at source shall be made as per the provisions of law and is to be construed as an advance tax paid by the contractor and no reimbursement thereof will be made.

Further, if BHEL, at the instance of customer or otherwise adopts the specific route for discharging output VAT liability itself, benefit of the reduction in liability of the contractor will be passed on to BHEL.

In case, BHEL is forced to pay any VAT liability on behalf of contractor, the same will be recovered from contractor's bill or otherwise as deemed fit

8.2 — 'Enabling Works'

~~The contractor shall pay all (save the specific exclusions as enumerated in this contract) taxes, fees, license charges, deposits, duties, tools, royalty, commissions or other charges which may be levied on the input goods & services consumed and output goods & services delivered in course of his operations in executing the contract. In case BHEL is forced to pay any of such taxes, BHEL shall have the right to recover the same from his bills or otherwise as deemed fit. (i.e. rates quoted by bidder shall be inclusive of Service Tax, VAT/WCT and all other taxes and duties)~~

~~However, Since the proposed work is in the nature of 'Works Contract service' as per Service tax law, Hence, For non-corporate contractors being Individual, HUF, Proprietary Firm, Partnership Firm or Association of Persons (AOP), BHEL shall recover the applicable Service Tax under reverse charge mechanism from the contractor and remit the same with the Government as per the provisions of Law. Necessary advice/confirmation of remittance shall be issued to the contractor. The contractor shall not be eligible for any refund/reimbursement of such service tax from BHEL. It shall be the responsibility of the contractor to submit proper invoice giving all the requisite details as per Service Tax Law for the determination of the service tax liability of BHEL under reverse charge mechanism. BHEL reserves the right to determine such liability based on the invoice submitted by the contractor or otherwise independently and remittance of the same with the Government.~~

8.3 New Taxes/Levies

In case the Government imposes any new levy/tax on the output service/ goods/work after award of the contract, the same shall be reimbursed by BHEL at actual.

In case any new tax/levy/duty etc. becomes applicable after the date of Bidder's offer, 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.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter-VIII: Taxes and Other Duties

No reimbursement/recovery on account of increase/reduction in the rate of taxes, levies, duties etc. on input goods/services/work shall be made. Such impact shall be taken care of by the Price Variation/Adjustment Clause (PVC) if any. In case PVC is not applicable for the contract, Bidder has to make his own assessment of the impact of future variation if any, in rates of taxes/duties/ levies etc. in his price bid.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter-IX : SPECIFIC EXCLUSIONS

9.0 Exclusions

THE FOLLOWING WORKS ARE SPECIFIC EXCLUSIONS FROM THE SCOPE OF WORK UNDER ERECTION, TESTING & COMMISSIONING OF TENDER SPECIFICATION-

- I) CIVIL WORKS EXCEPT TO THE EXTENT SPECIFICALLY INDICATED ELSEWHERE IN THIS TENDER.
- II) SUPPLY OF PRIMER AND PAINTS FOR FINAL PAINTING

- iii. SUB-DELIVERY ITEMS AND ELECTRICAL COMPONENTS SUCH AS PUSH-BUTTONS, JUNCTION BOXES ETC.
- iv. E&C WORK OF CABLE TRAYS, CABLES AND EARTHING ETC
- v. CONTROL PANELS, EPMS, MCC ETC.
- vi. ALL ELECTRICAL AND CONTROL & INSTRUMENTATION RELATED TO ITEMS EXCEPT THOSE SPECIFIED ELSEWHERE IN THESE SPECIFICATIONS.
- vii. TESTING AND COMMISSIONING OF HEATING ELEMENTS, THERMOSTATS, AND HV RECTIFIER TRANSFORMERS.
- viii. PNEUMATIC COPPER TUBING AND FITTINGS THEREOF.
- ix. ELECTRICAL AND C&I ITEMS OF VARIABLE FREQUENCY DRIVES AS PROVIDED ELSEWHERE IN THESE SPECIFICATIONS.
- x. ERECTION OF SUCTION AIR FILTER AND COLD BLAST PIPING

TECHNICAL CONDITIONS OF CONTRACT (TCC)
Chapter X: TENTATIVE LIST OF PACKAGES, WEIGHT DETAILS,
DIMENSIONS ETC OF EQUIPMENTS/SYSTEM

Tentative Details of Equipments/Systems for Erection, Testing and commissioning for each Unit -

(A) Surface Condenser

1. Shell Assembly (with shell, Tube sheet, support plates, spacers ets)
2. Tubes
3. Dome, Shell, Water Boxes ,Hotwell, Rupture Disc
4. Steel Bellows with Condenser neck, Collar, top Connecting piece
5. Stand & Surge pipes, Sacrificial anodes, Water expansion relief valve, vents & drain valves,
6. Foundation parts

(B) Steam Turbine & Auxiliaries:

1. Steam Turbine Multi stages with Base Frame
2. Bearing and couplings
3. Emergency over speed governor
4. Main throttle valve
5. Barring gear console (AC/DC Motor driven turning/barring Gear with manual operation facility)
6. Turbine Supervisory Instruments
7. Steam Turbine-multistage with base frame
8. Emergency trip cum stop valve
9. Tripping device
10. Blanket plate for steam blowing
11. Steam turbine Governing valve
12. Steam strainer built into Stop valve
13. Coupling & coupling guard between Steam Turbine & Turbo-Blower
14. Solenoid valve for remote tripping
15. Turbine sole plates & foundation bolts
16. Shaft grounding device
17. Mating flanges for turbine inlet & extraction flanges
18. Gland sealing system (Automatic)
19. Gland Steam leak off piping.
20. Turbine drain water piping within at one point TG Block/hall.
21. QCNRV for bleed steam piping
22. Vacuum Breaker valves
23. Casing drain valve

(C) Oil Supply System:

1. Lub Oil tank
2. Central Oil storage Tank with Pumps
3. Lube oil Pump assembly

TECHNICAL CONDITIONS OF CONTRACT (TCC)
Chapter X: TENTATIVE LIST OF PACKAGES, WEIGHT DETAILS,
DIMENSIONS ETC OF EQUIPMENTS/SYSTEM

4. Emergency oil Pump assembly
5. Overhead Emergency Oil tank
6. Lub oil accumulators
7. Governing oil accumulators
8. Duplex filter of lub oil
9. Suction Filter and silencer
10. Governing console
11. Oil reservoir vapour extractors / Oil mist fans
12. Overflow type sight flow indicator
13. Shaft Driven main oil pump
14. Turbine shaft driven Main oil Pump (MOP)
15. A.C Motor driven Auxiliary Oil Pump (AOP)
16. A.C Motor driven Jacking Oil Pump (JOP)
17. DC Motor driven Emergency Oil Pump (EOP)
18. Oil Cooler
19. Oil strainer (Oil Filter)
20. Oil centrifuge (Trolley Type)
21. Oil Heater
22. Polishing Filter
23. Filter vessel
24. Motor Driven vent Blower (Oil mist fan)

(D) Steam Jet Air Ejector

1. Air Ejector
2. Inter condenser drains
3. After condenser drains
4. Starting Ejector
5. Steam & air vapour suction headers
6. Slide plates & Foundation parts
7. Isolation valves on steam supply header & Individual ejector
8. Water expansion relief valves
9. Instruments isolation valves
10. Vents & drain valves
11. Silencer for starting ejector
12. Strainers

(E) Gland Steam Condenser with Steam jet ejectors 2X100%, Water expansion relief valve, Stand pipe, Isolation valves for instruments & stand pipes, Vents & drain valves.

(F) Blower in assembled condition with Air volumes regulator, Anti surge control Device and Anti choke controller, suction air filters, silencer, suction Air Intake etc

TECHNICAL CONDITIONS OF CONTRACT (TCC)
Chapter X: TENTATIVE LIST OF PACKAGES, WEIGHT DETAILS,
DIMENSIONS ETC OF EQUIPMENTS/SYSTEM

(G) Steam Turbine Control, Protection and Supervisory System:

- (i) Turbine control panels housing Electronic Governor, Turbine shaft vibration & Axial displacement monitoring system, TSI proximitors/probes, Temperature Scanners, Push buttons & lamps for remote operations, Field and local instruments/Gauges like temperature gauges/ pressure gauges, transmitters , flow elements, level indicators etc, Local Gauge Board.

(H) Balance of Plant- Mechanical

1. 2X120% capacity (1W+1S) Condensate Extraction Pumps (02 No.s) with Suction & Discharge connection and Pump Bearing
2. Condensate piping from Hotwell to CEP,
3. Condensate piping from CEP to GSC and Steam Jet Air Ejector etc.
4. Air and Steam piping between condenser and Ejector.
5. Drain piping from Drain Cooler, Gland Steam Condenser and Ejector Condensers to Condenser.
6. Condenser hotwell level control system including main and re-circulation control valves
7. Blower exhausts piping from Blower to Terminal point.
8. Application of thermal Insulation of Equipments (excluding spray insulation of steam turbine) and piping.
9. Turbine drains piping.
10. Gland Steam leak off piping.
11. Vacuum breaker valve with piping.
12. QCNRV with extraction piping.

NOTE:

- 1) Bill of quantity, dimension, and weight of components are tentative and will be received in loose condition. Apart from above certain items will be supplied in assembled condition. Entire work along with instruments/items supplied in assembled condition shall be carried at site as per BHEL drawings & terminal points issued at site & instruction of BHEL site engineer.

TECHNICAL CONDITIONS OF CONTRACT (TCC)
Chapter X: TENTATIVE LIST OF PACKAGES, WEIGHT DETAILS,
DIMENSIONS ETC OF EQUIPMENTS/SYSTEM

Tentative Weight details and Dimensions of Major Equipments

<i>(A) Blower Drive Turbine and Auxiliaries (For Each Unit)</i>				
Sl No.	ITEM DESCRIPTION	QTY	TOTAL WEIGHT (KGS)	DIMENSIONS (mm) LxWxH
1	casing top+ exhaust Top	01	1200	4500x4000x2750
2	casing bottom + exhaust hood bottom	01	18500	4500x5000x2000
3	Front Brg pedestal +Bed Plate Under FBP	01	2400	1000x1000x1000
4	Rear Brg. Housing	01	2400	1100x1600x1300
5	Rotor assembly	01	6000	4250x1400x1400
6	Guide Blade Carrier -1	01	1200	1000x1000x550
7	Guide Blade Carrier-2	01	600	1000x1000x300
8	Guide Blade Carrier -3	01	1200	1500x1500x400
9	LP Guide Blade Carrier	01	4500	4000x4000x1000
10	Bed Plate Under exhaust hood	01	1800	1500x800x110
11	Lube Oil tank	01	6800	5000x3500x2700
12	Lube Oil Pump assembly	02	2200	2600x2400x1100
13	Emergency Oil Pump assembly	01	1000	2300x2300x3000
14	Overhead Lube Oil tank	01	1600	1750 x 1750 x 2300
15	Lube Oil accumulators	01	1200	1800x500x2500
16	Governing oil accumulators	01	400	1000x500x2300
17	Barring gear console	01	850	700x500x1000
18	Oil Centrifuge (Trolley type)	01	450	1600x500x1700
19	Duplex filter for Lube oil	01	700	1500x600x2000
20	Jacking oil pump assembly	01	800	2500x2200x1600
21	Suction Filter & Silencer	01	30000	10000x9500x7000
22	Piping	-	34000	-
23	Governing Console	01	350	-
24	Valves	-	4000	
<i>(B) Surface Condenser (for each Unit)</i>				
1	Shell Assly (with shell, tube sheet, support plates, spacers etc)	01	41000	L 10000 x W 3500 x H 3700
2	Dome Assly	01	9000	L 6800 x W 3400 x H 2200
3	Hot Well Assly	01	3500	L 4100 x W 2400 x H 1800

TECHNICAL CONDITIONS OF CONTRACT (TCC)
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DIMENSIONS ETC OF EQUIPMENTS/SYSTEM

4	Tubes	6500	18525	OD 19.05 x 20BWG x L 7000
5	Misc (Stand pipes, surge pipes etc)	01	1500	-
<i>(C) Steam Jet Air ejector (for each Unit)</i>				
1	Assly	01	7100	L 6100 x W 1800 x H 2300
2	Misc (Starting ejector)	01	300	-
<i>(D) Gland Steam Condenser Assly (for each Unit)</i>				
1	Gland steam Condenser	01	1000	Ø 500 x L 2500
2	GSC Ejector assly	01	300	L 2700 x W 1200 x B 1200
<i>(E) Lube oil Cooler (for each Unit)</i>				
1	Per Cooler	01	7300	L 4800 x H 2400 x W 600
<i>(F) Blower (for each Unit)</i>				
1	Blower In assembled condition	01	66000	-
<i>(G) Piping (Common for all Units)</i>				
1	Piping (Excluding TG Integral Piping)	-	145000	(48.3 to 1800 mm)
<i>(H) Valves and silencer (Common for each Unit)</i>				
1	Valves and silencer coming in 72 inch size Pipe	-	8000	-
<i>(I) Condensate System (for each unit)</i>				
1	Condensate Extraction Pump	02	6000	4500X3000X1000

NOTE:

* Above weights & dimensions are tentative and may vary. All equipments & Aux. erected as dispatched from manufacturing units & received at site.

TECHNICAL CONDITIONS OF CONTRACT (TCC)
Chapter X: TENTATIVE LIST OF PACKAGES, WEIGHT DETAILS,
DIMENSIONS ETC OF EQUIPMENTS/SYSTEM

NOTE:

1. **BIDDERS ARE REQUESTED TO SPECIFICALLY NOTE THAT DETAILS OF EQUIPMENTS/SYSTEMS GIVEN ABOVE IS TENTATIVE AND HAS BEEN GIVEN TO ENABLE THE CONTRACTOR TO STUDY THE NATURE OF WORK AND TO UNDERSTAND THE COMPLETE SYSTEM. SCOPE OF WORK UNDER THIS CONTRACT COVERS ALL BALANCE WORKS LEFT OUT BY PREVIOUS AGENCIES AND REQUIRED FOR COMPLETION UNLESS EXCLUSIVELY EXCLUDED. AN EFFORT HAS BEEN MADE TO COMMUNICATE THE CURRENT STATUS AS MUCH AS POSSIBLE IN "SCOPE OF WORK" OF THIS TENDER. HOWEVER, CONTRACTOR SHALL MAKE HIS OWN SURVEY AND ASSESS THE BALANCE WORK. NO CLAIM WHATSOEVER WILL BE ENTERTAINED ON ACCOUNT ANY VARIATION IN THIS REGARD. BIDDER MUST QUOTE THEIR RATES CONSIDERING THESE FACTS.**

 2. **ALL ABOVE WEIGHT DETAILS GIVEN ARE ONLY TENTATIVE AND LIKELY TO VARY. THE ERECTION, TESTING, COMMISSIONING HAS TO BE CARRIED OUT FOR ALL THE EQUIPMENTS/AUXILIARIES/ITEMS COVERED UNDER THIS TENDER SPECIFICATION THAT ARE NECESSARY FOR COMPLETION OF THE TOTAL SYSTEM.**

 3. **SOME OF THE PACKAGES MAY BE SENT IN PARTS TO SUIT THE SITE CONDITION / TRANSPORTATION, THE SAME IS TO BE ASSEMBLED AT SITE WITHOUT ANY EXTRA COST, LIKEWISE THE PACKAGE MAY BE ASSEMBLED TOGETHER AND SEND AS A SINGLE ASSY. CONTRACTOR MAY HAVE TO DISMANTLE AND ERECT OR, ERECT AS SINGLE ASSEMBLY AS PER THE INSTRUCTION OF BHEL ENGINEERS WITHOUT ANY EXTRA COST.**
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TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter- XI PAINTING SCHEME

WILL BE ISSUED DURING EXECUTION

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter-XII:

Erection Testing and Commissioning of STG (TURBO BLOWER)

GENERAL REQUIREMENTS – COMMON TO ALL WORK OF ERECTION TESTING AND COMMISSIONING

17.1

THE INTENT OF SPECIFICATION IS TO PROVIDE SERVICES ACCORDING TO THE MOST MODERN AND PROVEN TECHNIQUES AND CODES. THE OMISSION OF SPECIFIC REFERENCE TO ANY METHOD, EQUIPMENT OR MATERIAL NECESSARY FOR PROPER AND EFFICIENT EXECUTION OF THIS WORK SHALL NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY OF PROVIDING SUCH FACILITIES TO COMPLETE THE WORK WITHOUT ANY EXTRA COMPENSATION.

17.2

THE TERMINAL POINTS DECIDED BY BHEL SHALL BE FINAL AND BINDING ON THE CONTRACTOR FOR DECIDING THE SCOPE OF WORK AND EFFECTING PAYMENT FOR THE WORK DONE.

17.3

THE WORK SHALL BE EXECUTED UNDER THE USUAL CONDITIONS AFFECTING MAJOR POWER PLANT CONSTRUCTION AND IN CONJUNCTION WITH NUMEROUS OTHER OPERATIONS AT SITE. THE CONTRACTOR AND HIS PERSONNEL SHALL COOPERATE WITH PERSONNEL OF BHEL, BHEL'S CUSTOMER, CUSTOMER'S CONSULTANTS AND OTHER CONTRACTORS, COORDINATING HIS WORK WITH OTHERS AND PROCEED IN A MANNER THAT SHALL NOT DELAY OR HINDER THE PROGRESS OF WORK OF THE PROJECT AS A WHOLE.

17.4

THE WORK COVERED UNDER THIS SPECIFICATION IS OF HIGHLY SOPHISTICATED NATURE, REQUIRING THE BEST QUALITY WORKMANSHIP, SUPERVISION, ENGINEERING AND CONSTRUCTION MANAGEMENT. THE CONTRACTOR SHOULD ENSURE PROPER PLANNING AND SUCCESSFUL & TIMELY COMPLETION OF THE WORK TO MEET THE OVERALL PROJECT SCHEDULE. THE CONTRACTOR MUST DEPLOY ADEQUATE QUANTITY OF TOOLS & PLANTS, MODERN / LATEST CONSTRUCTION AIDS ETC. HE MUST ALSO DEPLOY ADEQUATE TRAINED, QUALIFIED AND EXPERIENCED SUPERVISORY STAFF AND SKILLED PERSONNEL.

17.5

CONTRACTOR SHALL ERECT AND COMMISSION ALL THE EQUIPMENTS AND AUXILIARIES AS PER THE SEQUENCE & METHODOLOGY PRESCRIBED BY BHEL DEPENDING UPON THE TECHNICAL REQUIREMENTS. AVAILABILITY OF MATERIALS AND FRONTS WILL DECIDE THIS. BHEL ENGINEER'S DECISION REGARDING CORRECTNESS OF THE WORK AND METHOD OF WORKING SHALL BE FINAL AND BINDING ON THE CONTRACTOR. NO CLAIMS FOR EXTRA PAYMENT FROM THE CONTRACTOR WILL BE ENTERTAINED ON THE GROUND OF DEVIATION FROM THE METHODS / SEQUENCE ADOPTED IN ERECTION OF SIMILAR SETS ELSEWHERE.

17.6

ALL NECESSARY CERTIFICATES AND LICENSES, PERMITS & CLEARANCES REQUIRED TO CARRY OUT THIS WORK FROM THE RESPECTIVE STATUTORY/ LOCAL AUTHORITIES ARE TO BE ARRANGED BY THE CONTRACTOR AT HIS COST IN TIME TO ENSURE SMOOTH PROGRESS OF WORK.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter-XII:

Erection Testing and Commissioning of STG (TURBO BLOWER)

17.7

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17.8

THE WORK SHALL CONFIRM TO DIMENSIONS AND TOLERANCES SPECIFIED IN THE VARIOUS DRAWINGS / DOCUMENTS THAT WILL BE PROVIDED DURING VARIOUS STAGES OF ERECTION. IF ANY PORTION OF WORK IS FOUND TO BE DEFECTIVE IN WORKMANSHIP, NOT CONFORMING TO DRAWINGS OR OTHER STIPULATIONS DUE TO CONTRACTOR'S FAULT, THE CONTRACTOR SHALL DISMANTLE AND RE-DO THE WORK DULY REPLACING THE DEFECTIVE MATERIALS AT HIS COST, FAILING WHICH THE WORK WILL BE GOT DONE BY BHEL AND RECOVERIES WILL BE EFFECTED FROM THE CONTRACTOR'S BILLS TOWARDS EXPENDITURE INCURRED INCLUDING COST OF MATERIALS AND DEPARTMENTAL OVERHEADS OF BHEL.

17.9

THE CONTRACTOR SHALL PERFORM ANY SERVICES, TESTS ETC, WHICH MAY NOT BE SPECIFIED BUT NEVERTHELESS, REQUIRED FOR THE COMPLETION OF WORK WITHIN QUOTED RATES.

17.10

ALL NECESSARY CERTIFICATES AND LICENSES REQUIRED FOR CARRYING OUT THIS WORK ARE TO BE ARRANGED BY THE CONTRACTOR EXPEDITIOUSLY.

17.11

THE CONTRACTOR SHALL EXECUTE THE WORK IN THE MOST SUBSTANTIAL AND WORKMAN LIKE MANNER. THE STORES SHALL BE HANDLED WITH CARE AND DILIGENCE.

17.12

BHEL RESERVES RIGHT TO RECOVER FROM THE CONTRACTOR ANY LOSS WHICH ARISES OUT OF UNDUE DELAY / DISCREPANCY / SHORTAGE / DAMAGE OR ANY OTHER CAUSES DUE TO CONTRACTOR'S LAPSE DURING ANY STAGE OF WORK. ANY LOSS TO BHEL DUE TO CONTRACTOR'S LAPSE SHALL HAVE TO BE MADE GOOD BY THE CONTRACTOR.

17.13

ALL CRANES, TRANSPORT EQUIPMENT, HANDLING EQUIPMENT, TOOLS, TACKLES, FIXTURES, EQUIPMENT, MANPOWER, SUPERVISORS/ENGINEERS, CONSUMABLES ETC, EXCEPT OTHERWISE SPECIFIED AS BHEL SCOPE OF FREE ISSUE, REQUIRED FOR THIS SCOPE OF WORK SHALL BE PROVIDED BY THE CONTRACTOR. ALL EXPENDITURE INCLUDING TAXES AND INCIDENTALS IN THIS CONNECTION WILL HAVE TO BE BORNE BY CONTRACTOR UNLESS OTHERWISE SPECIFIED IN THE RELEVANT CLAUSES. THE CONTRACTOR'S QUOTED RATES SHOULD BE INCLUSIVE OF ALL SUCH CONTINGENCIES.

17.14

DURING THE COURSE OF ERECTION, TESTING AND COMMISSIONING CERTAIN REWORK / MODIFICATION / RECTIFICATION / REPAIR / FABRICATION ETC MAY BECOME NECESSARY ON ACCOUNT OF FEED BACK / REVISION OF DRAWING ETC. THIS WILL ALSO INCLUDE MODIFICATIONS /

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter-XII:

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RE-WORKS SUGGESTED BY BHEL / CUSTOMER / OTHER INSPECTION GROUP. CONTRACTOR SHALL CARRY OUT SUCH REWORK / MODIFICATION / RECTIFICATION / FABRICATION / REPAIR ETC PROMPTLY AND EXPEDITIOUSLY. DAILY LOG SHEETS SIGNED BY BHEL ENGINEER AND INDICATING THE DETAILS OF WORK CARRIED OUT, MAN-HOURS ETC SHALL BE MAINTAINED BY THE CONTRACTOR FOR SUCH REWORKS. CLAIM OF CONTRACTOR IF ANY, FOR SUCH WORKS WILL BE GOVERNED BY RELEVANT CLAUSES OF 'GENERAL CONDITIONS OF CONTRACT'.

17.15

ALL WORKS SUCH AS CLEANING, LEVELING, ALIGNING, TRIAL ASSEMBLY, DISMANTLING OF CERTAIN EQUIPMENTS / COMPONENTS FOR CHECKING AND CLEANING, SURFACE PREPARATION, FABRICATION OF STRUCTURES, TUBES AND PIPES AS PER GENERAL ENGINEERING PRACTICE AND AS PER BHEL ENGINEER'S INSTRUCTIONS AT SITE, CUTTING, GOUGING, WELD DEPOSITING, GRINDING, STRAIGHTENING, CHAMFERING, FILING, CHIPPING, DRILLING, REAMING, SCRAPPING, LAPPING, FITTING UP ETC AS MAY BE APPLICABLE IN SUCH ERECTION WORKS AND WHICH ARE TREATED INCIDENTAL TO THE ERECTION WORKS AND NECESSARY TO COMPLETE THE WORK SATISFACTORILY, SHALL BE CARRIED OUT BY THE CONTRACTOR AS PART OF THE WORK WITHIN THE QUOTED RATES.

17.16

THE CONTRACTOR SHALL MAKE ALL FIXTURES, TEMPORARY SUPPORTS, STEEL STRUCTURES REQUIRED FOR JIGS & FIXTURES, ANCHORS FOR LOAD AND GUIDE PULLEYS REQUIRED FOR THE WORK. CONTRACTOR SHALL ARRANGE NECESSARY STEEL FOR SUCH USAGE.

17.17

THE CONTRACTOR SHALL TAKE DELIVERY OF THE COMPONENTS, EQUIPMENTS, CHEMICALS, AND LUBRICANTS ETC FROM THE BHEL STORES/ STORAGE AREA AFTER GETTING THE APPROVAL OF BHEL ENGINEER ON STANDARD INDENT FORMS OF BHEL. COMPLETE AND DETAILED ACCOUNT OF THE MATERIALS AND EQUIPMENTS AFTER USAGE SHALL BE SUBMITTED TO THE BHEL AND RECONCILED PERIODICALLY.

17.18

THE DISTANCE BETWEEN STORAGE AREA AND ERECTION SITE IS APPROX 1 KM. CONTRACTOR SHALL PLAN AND TRANSPORT EQUIPMENTS, COMPONENTS FROM STORAGE TO ERECTION SITE AND ERECT THEM IN SUCH A MANNER AND SEQUENCE THAT MATERIAL ACCUMULATION AT SITE DOES NOT LEAD TO CONGESTION AT SITE OF WORK. MATERIALS SHALL BE STACKED NEATLY, PRESERVED AND STORED IN THE CONTRACTOR'S SHED AND AT WORK AREAS IN AN ORDERLY MANNER. IN CASE IT IS NECESSARY TO SHIFT AND RE-STACK THE MATERIALS KEPT AT WORK AREAS/ SITE TO ENABLE OTHER AGENCIES TO CARRY OUT THEIR WORK OR FOR ANY OTHER REASON, SAME SHALL BE DONE BY CONTRACTOR MOST EXPEDITIOUSLY AS INCIDENTAL TO WORK.

17.19

PLANT MATERIALS SHOULD NOT BE USED FOR ANY TEMPORARY SUPPORTS / SCAFFOLDING/ PREPARING PRE-ASSEMBLY BED ETC.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

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17.20

THE DETAILS OF EQUIPMENTS TO BE ERECTED UNDER THIS CONTRACT ARE GENERALLY AS PER THE SCHEDULE GIVEN IN RELEVANT APPENDICES. THESE DETAILS ARE APPROXIMATE AND MEANT ONLY TO GIVE A GENERAL IDEA TO THE TENDERER ABOUT THE MAGNITUDE OF THE WORK INVOLVED. ACTUAL QUANTUM AND TYPE OF EQUIPMENTS WILL BE BASED ON THE RELEVANT ERECTION DOCUMENTS WHICH WILL BE FURNISHED TO THE CONTRACTOR IN DUE COURSE OF ERECTION AND THE WEIGHT AND QUANTITY AS PER THE RELEVANT ENGINEERING DOCUMENTS WILL ONLY BE ADMISSIBLE FOR THE BILLING PURPOSE.

17.21

HANGERS & SUSPENSIONS, SUPPORTS ETC FOR TUBES, PIPING, & DUCTS ETC WILL BE SUPPLIED IN RUNNING / RANDOM LENGTHS / SIZES WHICH SHALL BE CUT TO SUITABLE SIZES AND ADJUSTED AS REQUIRED.

17.22

SPRING SUSPENSION / CONSTANT LOAD HANGERS MAY HAVE TO BE PRE-ASSEMBLED FOR REQUIRED LOAD AND ERECTION CARRIED OUT AS PER INSTRUCTIONS OF BHEL. ADJUSTMENTS, REMOVAL OF TEMPORARY ARRESTS/LOCKS, CUTTING OF EXCESS THREAD LENGTH OF HANGER TIE-ROD ETC HAVE TO BE CARRIED OUT AS AND WHEN REQUIRED. LOAD SETTING OF SPRING HANGERS, AS PER BHEL'S DOCUMENTS/INSTRUCTIONS, DURING VARIOUS STAGES OF ERECTION & TESTING AND AFTER FLOATING OF PIPING/DUCTING DURING COLD AND HOT CONDITION WILL HAVE TO BE DONE AS PART OF WORK. THIS EXERCISE MAY HAVE TO BE REPEATED TILL SATISFACTORY RESULTS ARE ACHIEVED.

17.23

LAYOUT OF FIELD ROUTED/ SMALL BORE PIPING SHALL BE DONE AS PER SITE REQUIREMENT. NECESSARY SKETCH FOR ROUTING THESE LINES SHOULD BE GOT APPROVED FROM BHEL BY THE CONTRACTOR. THERE IS A POSSIBILITY OF SLIGHT CHANGE IN ROUTING THE ABOVE PIPE LINES EVEN AFTER COMPLETION OF ERECTION.

17.24

INSTALLATION AND WELDING OF NECESSARY INSTRUMENTATION TAPPING POINTS, & MEASUREMENT DEVICES, WILL ALSO BE THE RESPONSIBILITY OF THE CONTRACTOR AND WILL BE DONE AS PER THE INSTRUCTIONS OF BHEL SITE ENGINEER. THE INSTALLATION OF ALL THE ABOVE ITEMS WILL BE CONTRACTOR'S RESPONSIBILITY EVEN IF THE:

- I. ITEMS ARE NOT SPECIFICALLY INDICATED UNDER THE RESPECTIVE PRODUCT GROUPS AS GIVEN IN THE TECHNICAL SPECIFICATIONS.

- II. ITEMS ARE SUPPLIED BY AN AGENCY OTHER THAN BHEL.

NDE, AND POST WELD HEAT TREATMENT FOR ABOVE SHALL BE DONE AS PER THE SPECIFICATIONS AS PART OF WORK.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

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17.25

ACTUATORS/DRIVES OF VALVES, DAMPERS, GATES, POWERED VANES ETC MAY HAVE TO BE SERVICED, LUBRICATED, BEFORE ERECTION, DURING PRE-COMMISSIONING & COMMISSIONING, INCLUDING CARRYING OUT MINOR ADJUSTMENTS REQUIRED AS INCIDENTAL TO THE WORK.

17.26

ALL ELECTRICAL MOTORS HAVE TO BE TESTED FOR IR & PI VALUES PRIOR TO THE TRIAL RUN. WHERE REQUIRED, DRY OUT MAY HAVE TO BE CARRIED OUT BY USING EXTERNAL HEATING SOURCE. CONTRACTOR SHALL MAKE ALL ARRANGEMENTS IN THIS REGARD AND COMPLETE THE WORK AS INSTRUCTED. BHEL WILL PROVIDE THE MOTORIZED INSULATION TESTERS.

17.27

IN INSTALLATION OF VARIOUS EQUIPMENTS IT MAY BECOME NECESSARY TO INSTALL THESE ON TEMPORARY SUPPORTS/ HANGER DUE TO VARIOUS REASONS INCLUDING NON-AVAILABILITY OF SUSPENSION MATERIALS. CONTRACTOR SHALL INSTALL SUCH TEMPORARY SUSPENSIONS/HANGERS AND LATER ON SHIFT THE RELEVANT EQUIPMENTS TO THEIR RESPECTIVE PERMANENT HANGERS/ SUSPENSIONS/ SUPPORTS AS INCIDENTAL TO WORK. REQUISITE MATERIALS FOR SUCH TEMPORARY ARRANGEMENTS WILL BE PROVIDED BY BHEL ON FREE -RETURNABLE BASIS WHICH SHALL BE RETURNED TO BHEL AFTER THE USE.

17.28

THE WORK SHALL BE CARRIED OUT STRICTLY IN ACCORDANCE TO THE "FIELD QUALITY PLAN" APPROVED BY BHEL/CLIENT. CONTRACTOR, JOINTLY WITH BHEL, SHALL PREPARE ALL NECESSARY RECORDS OF MEASUREMENTS/READINGS/ PROTOCOLS ETC.

17.29

ALL WORKS SUCH AS CLEANING, LEVELLING, ALIGNING, TRIAL ASSEMBLY, DISMANTLING OF CERTAIN EQUIPMENTS / COMPONENTS FOR CHECKING AND CLEANING, SURFACE PREPARATION, FABRICATION OF SHEETS, TUBES AND PIPES AS PER THE GENERAL ENGINEERING PRACTICE AND AS PER BHEL ENGINEERS INSTRUCTIONS AT SITE, CUTTING, WELD DESPOSING, GRINDING, STRAIGHTENING, CHAMFERING, FILING, CHIPPING, DRILLING, REAMING, SCRAPING, LAPPING, FITTING UP ETC AS MAY BE APPLICABLE IN SUCH ERECTION WORKS AND WHICH ARE TREATED INCIDENTAL TO THE ERECTION WORK AND NECESSARY TO COMPLETE THE WORK SATISFACTORILY SHALL BE CARRIED OUT BY THE CONTRACTOR AS PART OF THE WORK.

17.30

INTERCONNECTION/ HOOKUP, IF ANY, WITH THE EXISTING SYSTEM SHALL FORM PART OF WORK. SUCH INTERCONNECTIONS, HOOKUPS MAY REQUIRE SHUT DOWN OF RUNNING PLANT AND THE RELEVANT WORK HAVE TO BE COMPLETED WITHIN SUCH PLANNED SHUTDOWNS. THIS MAY CALL FOR WORKING WITH ENHANCED RESOURCES AND ON EXTENDED HOURS. CONTRACTOR'S OFFER SHALL COVER ALL SUCH CONTINGENCIES.

17.31

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CONTRACTOR SHALL REGULATE FLOW OF MATERIAL TO AND FROM SITE IN SUCH A MANNER AND SEQUENCE THAT MATERIAL ACCUMULATION AT SITE DOES NOT LEAD TO CONGESTION AT SITE. IN CASE IT IS NECESSARY TO SHIFT AND RESTACK THE MATERIALS KEPT AT WORK AREAS / SITE TO ENABLE OTHER AGENCIES TO CARRY OUT THEIR WORK OR FURTHER ANY OTHER REASON, IT SHALL BE DONE BY THE CONTRACTOR MOST EXPEDITIOUSLY. NO CLAIM FOR EXTRA PAYMENT FOR SUCH WORK WILL BE ENTERTAINED.

17.32

IT MAY SO HAPPEN THAT CERTAIN COMPONENTS LIKE MANHOLE DOORS, HANGER ETC MAY BE SUPPLIED IN LOOSE ITEMS. THEY NEED TO BE ASSEMBLED AS PER RELEVANT DRAWINGS OR AS PER ADVICE OF BHEL ENGINEER PRIOR TO ERECTION. THIS FORMS THE PART OF THE SCOPE OF WORK.

17.33

THE CONTRACTOR SHALL HAVE TOTAL RESPONSIBILITY FOR ALL EQUIPMENT AND MATERIALS IN HIS CUSTODY AT CONTRACTOR'S STORES, LOOSE, SEMI-ASSEMBLED, ASSEMBLED OR ERECTED BY HIM AT SITE. HE SHALL EFFECTIVELY PROTECT THE FINISHED WORKS FROM ACTION OF WEATHER AND FROM DAMAGES OR DEFAACEMENT AND SHALL ALSO COVER THE FINISHED PARTS IMMEDIATELY ON COMPLETION OF WORK AS PER BHEL ENGINEER'S INSTRUCTIONS. THE MACHINE SURFACES/FINISHED SURFACES SHOULD BE GREASED AND COVERED.

17.34

BHEL IS OPERATING WEB BASED COMPUTERIZED SITE OPERATION MANAGEMENT SYSTEM (SOMS) THAT INCLUDES, INTER-ALIA, ISSUE OF MATERIALS, DAILY PROGRESS REPORTING, CONTRACTOR'S RUNNING MONTHLY BILLING AND MATERIAL RECONCILIATION THROUGH A COMPUTERIZED DATA MANAGEMENT SYSTEM. CONTRACTOR SHALL INSTALL NECESSARY HARDWARE TO HOOK-UP WITH THE BHEL'S SYSTEM AND USE THE SAME FOR HIS SCOPE OF WORK.

IN THE EVENT THE COMPUTERIZED SOMS IS INOPERATIVE FOR ANY REASONS, THE CONTRACTOR SHALL TAKE DELIVERY OF MATERIALS FROM THE STORAGE AREA/SHEDS OF BHEL/CUSTOMER AFTER GETTING THE APPROVAL OF THE ENGINEER/CUSTOMER ON STANDARD INDENT FORMS TO BE SPECIFIED BY BHEL/CUSTOMER. ALL THESE RECORDS HOWEVER SHALL BE UPDATED IN THE SOMS AS AND WHEN THE SOMS IS REACTIVATED/ NORMALIZED.

17.35

GASES LIKE ARGON, OXYGEN, ACETYLENE ETC THAT ARE REQUIRED FOR ERECTION RELATED ACTIVITIES SHALL BE ARRANGED BY THE CONTRACTOR AT HIS COST. FOR T-91 MATERIAL SITE WELD JOINTS ARGON AS PER GRADE-3 OF IS 5760: 1998 WITH OXYGEN AND WATER VAPOUR RESTRICTED TO MAX 6 PPM EACH AND WITH ARGON PURITY LEVEL OF MINIMUM 99.99% SHALL BE ARRANGED AND USED BY THE CONTRACTOR. THE SUPPLY SHOULD ACCOMPANY TEST CERTIFICATE FOR THE BATCH INDICATING INDIVIDUAL ELEMENT 'PPM' LEVEL AND OVERALL PURITY LEVEL.

17.38

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ALL LUBRICANTS AND CHEMICALS REQUIRED FOR TESTING, PRESERVATION, CHEMICAL CLEANING / ACID CLEANING, OIL FLUSHING, AND THE LUBRICANTS FOR TRIAL RUNS OF THE EQUIPMENTS AND TRIAL OPERATION OF THE UNIT WILL BE SUPPLIED BY BHEL FREE OF CHARGES.

17.39

CONTRACTOR SHALL USE HIS OWN LIFTING TOOLS & TACKLES / CRANE OF SUITABLE CAPACITY WITH OTHER REQUIRED ARRANGEMENTS FOR THE ENTIRE SCOPE OF WORK. HOWEVER BHEL'S CUSTOMER IS HAVING ONLY **ONE 60 / 10 T CAPACITY** ELECTRIC OVERHEAD TRAVELLING (EOT) CRANE WITHIN THE TURBINE HALL AND FACILITY OF THIS EOT CRANE WILL BE EXTENDED FREE OF HIRE CHARGES FOR THE ERECTION OF TURBINES AND TURBO BLOWER EQUIPMENTS UNDER THIS TENDER SPECIFICATION DEPENDING ON AVAILABILITY, LIFTING CAPACITY, APPROACH & ACCESSIBILITY. NO CLAIMS ON ACCOUNT OF NON-AVAILABILITY OF BHEL/CLIENT'S CRANE SHALL BE ENTERTAINED AT ANY POINT OF TIME.

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19.0 PREPARATION OF FOUNDATIONS, AND GROUTING OF EQUIPMENT

19.1

BUILDING FOUNDATIONS AND OTHER NECESSARY CIVIL WORKS FOR SUPPORTING STRUCTURES, EQUIPMENTS ETC WILL BE PROVIDED BY BHEL / CUSTOMER. THE CHECKING OF DIMENSIONAL ACCURACY, AXES, ELEVATION, LEVELS ETC, WITH REFERENCE TO BENCH MARKS OF FOUNDATIONS AND ANCHOR BOLT PITS HAVE TO BE CHECKED AND LOGGED BY THE CONTRACTOR. THE PERMANENT BENCHMARK / REFERENCE MARKS WILL HAVE TO BE TRANSFERRED TO NEW LOCATIONS WITH SUFFICIENT CARE TO MAINTAIN THE ACCURACY AND PROTECTED / PRESERVED WITH ADEQUATE CARE (TO ENABLE RECHECKING AT LATER DATES) AS PER BHEL INSTRUCTION.

MINOR ADJUSTMENT OF FOUNDATION LEVEL, DRESSING AND CHIPPING OF FOUNDATION SURFACES AND BLUE-MATCHING (WHEREVER REQUIRED) FOR OF ALL EQUIPMENTS AS PER BHEL ENGINEERS INSTRUCTIONS, SHOULD BE DONE BY THE CONTRACTOR AS PART OF THE WORK. CONTRACTOR/BHEL SHALL PREPARE PROTOCOLS BEFORE TAKING OVER THE FOUNDATIONS. DRESSING AND CHIPPING OF FOUNDATIONS UPTO 35MM FOR ACHIEVING PROPER LEVELS WILL BE WITHIN THE SCOPE OF WORK/SPECIFICATION.

19.2

ALL TEMPORARY FOUNDATIONS AND ANCHOR POINTS REQUIRED FOR INSTALLING ERECTION EQUIPMENTS AND WINCHES, FOUNDATIONS FOR PUMPS, TANKS ETC ARE IN THE SCOPE OF CONTRACTOR. ALL BUILDING MATERIALS LIKE CEMENT, STEEL INCLUDING RE-INFORCEMENT BARS, GRITS CEMENTS ETC FOR SUCH TEMPORARY FOUNDATIONS SHALL HAVE TO BE ARRANGED BY THE CONTRACTOR WITHIN THE QUOTED RATES. ALL SUCH FOUNDATIONS SHALL BE DEMOLISHED AND NORMAL GROUND CONDITIONS RESTORED AFTER THE USAGE.

19.3

CONTRACTOR SHALL CARRY OUT SCRAPPING AND BLUE MATCHING OF EMBEDDED PLATES/ PACKERS. CHIPPING AND THE LEVELING OF CONCRETE SURFACES, FINE DRESSING UP TO THE EXTENT REQUIRED TO OBTAIN CONTACT BETWEEN PACKER AND CONCRETE, IS ALSO COVERED IN THE SCOPE OF THIS WORK. SCRAPPING, CHIPPING AND MATCHING SHALL BE DONE SO AS TO ACHIEVE PRESCRIBED PERCENTAGE OF CONTACT BETWEEN THE TWO SURFACES.

19.4

BHEL WILL PROVIDE FREE OF COST ONLY THE SHIMS AND PACKER PLATES (EITHER MACHINED OR PLAIN) WHICH GO AS PERMANENT PART OF THE EQUIPMENT. CERTAIN PACKER PLATES AND SHIMS OVER AND ABOVE THE QUANTITY RECEIVED AS A PART OF SUPPLIES FROM MANUFACTURING UNITS OF BHEL WILL HAVE TO BE CUT OUT FROM STEEL PLATES / STEEL SHEETS AT SITE TO MEET SITE REQUIREMENT. CONTRACTOR SHALL CUT AND PREPARE PACKERS AND SHIMS BY GAS CUTTING / CHISELING / GRINDING AND DE-BURR THE SAME. HOWEVER, MACHINING OF THE PACKERS WHEREVER NECESSARY SHALL BE ARRANGED BY CONTRACTOR.

19.5

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COMPLETE GROUTING OF STRUCTURES EQUIPMENTS, INCLUDING ANCHOR/ FOUNDATION BOLTS, BENEATH BASE, BASE HOLLOWES ETC, AS MAY BE APPLICABLE, IS INCLUDED IN THE SCOPE OF CONTRACTOR. ARRANGING ALL LABOUR, BUILDING MATERIALS INCLUDING CEMENT, ORDINARY PORTLAND AS WELL AS QUICK SETTING – FREE FLOW - NON-SHRINK GROUT MIX (E.G. CONBEXTRA GP1/GP2), FORM WORK, SHUTTERING, AND ANY OTHER REQUIREMENTS IS IN THE CONTRACTOR'S SCOPE. CONTRACTOR SHALL OBTAIN APPROVAL OF BHEL FOR CEMENT (ORDINARY PORTLAND AS-WELL-AS QUICK SETTING – FREE FLOW- NON-SHRINK GROUT MIX) PRIOR TO USE. CLEANING OF FOUNDATION SURFACES, POCKET HOLES AND ANCHOR BOLT PITS AND DE-WATERING AND MAKING THEM FREE OF OIL, GREASE, SAND AND OTHER FOREIGN MATERIALS BY SODA WASHING, WATER WASHING, COMPRESSED AIR AND OTHER APPROVED METHODS ARE WITHIN THE SCOPE OF THIS SPECIFICATION/ WORK.

19.6

AFTER THE GROUTING HAS FINALLY SET AND CURED, ALIGNMENT OF EQUIPMENTS INVOLVED SHALL BE CHECKED AGAIN TO VERIFY FOR ANY DISTURBANCE OR ANY OTHER REASON. IF REQUIRED, DE-COUPLING OF EQUIPMENTS HAS TO BE DONE FOR CONDUCTING THE VERIFICATION. IN CASE ANY DISTURBANCE IS NOTICED THE CAUSE, IF ANY, SHALL BE REMOVED AND RE-ALIGNMENT DONE AS PART OF WORK.

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20.0 WELDING, RADIOGRAPHY AND OTHER NON-DESTRUCTIVE TESTING, POST WELD HEAT TREATMENT

20.1 WELDING

20.1.1

INSTALLATION OF EQUIPMENT INVOLVES GOOD QUALITY WELDING, NDE CHECKS, POST WELD HEAT TREATMENT ETC. CONTRACTOR'S PERSONNEL ENGAGED SHOULD HAVE ADEQUATE QUALIFICATION ON THE ABOVE WORKS.

20.1.2

THE METHOD OF WELDING (VIZ) ARC, TIG OR OTHER METHOD WILL BE INDICATED IN THE DETAILED DRAWING/DOCUMENTS. BHEL ENGINEER WILL HAVE THE OPTION OF CHANGING THE METHOD OF WELDING AS PER SITE REQUIREMENT.

20.1.3

WELDING OF HIGH PRESSURE JOINTS SHALL BE DONE BY IBR CERTIFIED HIGH PRESSURE WELDERS WHO HAVE BEEN PERMITTED BY CIB OF STATE CONCERNED FOR DEPLOYMENT AT THE SITE OF WORK.

20.1.4

WELDING OF ALL ATTACHMENTS TO PRESSURE PARTS, PIPING SHALL BE DONE ONLY BY THE QUALIFIED AND APPROVED WELDERS.

20.1.5

BEFORE ANY WELDER IS ENGAGED ON WORK, HE SHALL BE TESTED AND QUALIFIED BY BHEL/CUSTOMER, THOUGH THEY MAY POSSESS THE IBR/OTHER CERTIFICATE. BHEL RESERVES THE RIGHT TO REJECT ANY WELDER WITHOUT ASSIGNING ANY REASON. ALL THE EXPENDITURE IN TESTING/QUALIFICATION OF THE CONTRACTOR'S WELDER SHALL BE BORNE BY CONTRACTOR.

20.1.6

UNSATISFACTORY AND CONTINUOUS POOR PERFORMANCE MAY RESULT IN DISCONTINUATION OF CONCERNED WELDER.

20.1.7

THE WELDED SURFACE SHALL BE CLEANED OF SLAG AND PAINTED WITH PRIMER PAINT TO PREVENT RUSTING, CORROSION. FOR THIS, CONSUMABLES LIKE PAINT /PRIMER ETC WILL BE IN THE CONTRACTOR'S SCOPE.

20.1.8

HP JOINT FIT-UPS, SHOULD BE PROTECTED, WHERE REQUIRED, BY USE OF TAPES/PROTECTIVE PAINT AS MAY BE PRESCRIBED BY BHEL. THE CONTRACTOR SHALL SUPPLY PROTECTIVE PAINTS/TAPES ETC

20.1.9

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THE CONTRACTOR SHALL MAINTAIN WELDING RECORDS IN THE FORM AS PRESCRIBED BY BHEL CONTAINING ALL NECESSARY DETAILS, AND SUBMIT THE SAME TO THE BHEL ENGINEER AS REQUIRED. INTERPRETATION OF THE BHEL ENGINEER REGARDING ACCEPTABILITY OF THE WELDS SHALL BE FINAL.

20.1.10

PREHEATING, INTER-PASS HEATING, POST WELD HEATING AND STRESS RELIEVING AFTER WELDING ARE PART OF ERECTION WORK AND SHALL BE PERFORMED BY THE CONTRACTOR IN ACCORDANCE WITH BHEL ENGINEER'S INSTRUCTIONS. NORMALLY THE ELECTRIC RESISTANCE HEATING METHOD WILL BE ADOPTED. CONTRACTOR SHALL ARRANGE TO SUPPLY HEATING EQUIPMENT WITH AUTOMATIC RECORDING DEVICES. ALSO THE CONTRACTOR SHALL HAVE TO ARRANGE FOR LABOUR, ALL HEATING ELEMENTS, THERMOCOUPLES AND ATTACHMENT UNITS, GRAPH SHEETS, THERMAL CHALKS, & INSULATING MATERIALS LIKE MINERAL WOOL, ASBESTOS CLOTH, CERAMIC BEADS, ASBESTOS ROPES ETC, REQUIRED FOR ALL HEATING AND STRESS RELIEVING WORKS.

20.1.11

ALL THE RECORDED GRAPHS FOR HEAT TREATMENT WORKS SHALL BE THE PROPERTY OF BHEL AND SHALL BE HANDED OVER TO BHEL SITE IN-CHARGE WHEN DEMANDED.

20.1.12

JOINT FIT UP WILL BE A STAGE OF INSPECTION. WHERE REQUIRED, JOINTS SHALL BE OFFERED FOR VISUAL INSPECTION AFTER ROOT RUN. SUBSEQUENT WELDING SHOULD BE MADE ONLY AFTER THE APPROVAL OF ROOT RUN.

20.2.0 SOCKET WELDING

IN EXECUTION OF THIS WORK, CONSIDERABLE NUMBER OF SOCKET WELD JOINTS IS INVOLVED. THE EXACT QUANTITY OF SUCH SOCKET WELDS OR PROBABLE VARIATION IN THE QUANTUM CANNOT BE FURNISHED. THE TENDERER SHALL TAKE NOTICE OF THIS WHILE QUOTING AS NO EXTRA CLAIM ON THIS ACCOUNT WILL BE ENTERTAINED.

20.2.1

WELDING ELECTRODES HAVE TO BE STORED IN ENCLOSURES HAVING TEMPERATURE AND HUMIDITY CONTROL ARRANGEMENTS. THIS ENCLOSURE SHALL MEET BHEL SPECIFICATIONS.

20.2.2

WELDING ELECTRODES, PRIOR TO THEIR USE, CALL FOR BAKING FOR SPECIFIED PERIOD AND WILL HAVE TO BE HELD AT SPECIFIED TEMPERATURE FOR SPECIFIED PERIOD. ALSO, DURING EXECUTION, THE WELDING ELECTRODES HAVE TO BE CARRIED IN PORTABLE OVENS.

20.2.3

THE PIPING WORK COMING UNDER IBR PURVIEW (E.G. WELDING, HEAT TREATMENT OF HP JOINTS) HAS TO BE EXECUTED AS PER THE LATEST VERSION OF INDIAN BOILER REGULATION AND AMENDMENTS THEREOF. BHEL WILL FURNISH IBR DOCUMENTS AND DRAWINGS FOR PIPING &

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FITTINGS AND FURTHER APPROVALS OF IBR/ STATUTORY AUTHORITIES FOR DRAWINGS, PRE-ASSEMBLY & ERECTION AND OTHER WORKS SHALL BE TAKEN BY CONTRACTOR.

20.3.0 HEAT TREATMENT:

20.3.1

FOR THE PURPOSE OF TEMPERATURE RECORDING OF STRESS RELIEVING PROCESS WHEREVER APPLICABLE, THERMOCOUPLES HAVE TO BE ATTACHED TO THE WELD JOINT. THE NUMBER OF TEMPERATURE MEASURING POINTS AND LOCATIONS SHALL BE AS PER THE STANDARDS OF BHEL. THERMOCOUPLES HAVE TO BE ATTACHED USING CAPACITOR DISCHARGE TYPE PORTABLE THERMOCOUPLE ATTACHMENT UNIT. CONTRACTOR SHALL ARRANGE SUFFICIENT NUMBER OF THERMOCOUPLE ATTACHMENT UNITS.

20.3.2

CONTRACTOR SHOULD PROVIDE TEMPERATURE INDICATOR / TEMPERATURE RECORDER FOR MEASURING TEMPERATURE DURING PRE-HEATING FOR WELDING OR FOR CONTROLLING TEMPERATURE OF METAL FOR HOT CORRECTION ETC. THE TEMPERATURE RECORDERS SHOULD BE PREFERABLY OF SOLID STATE TYPE.

20.3.3

HEAT TREATMENT MAY BE REQUIRED TO BE CARRIED OUT AT ANY TIME (DAY OR NIGHT) TO ENSURE THE CONTINUITY OF THE PROCESS. THE CONTRACTOR SHALL MAKE ALL NECESSARY ARRANGEMENTS INCLUDING LABOURER REQUIRED FOR THE SAME AS PER DIRECTIONS OF BHEL.

20.3.4

IN CERTAIN CASES ONLY THE PRE-HEATING OF WELD JOINTS MAY BE CALLED FOR.

20.3.5

FOR WELD JOINTS OF HEAVY STRUCTURAL SECTIONS, IF HEAT TREATMENT IS REQUIRED, THE SAME SHALL BE CARRIED OUT AS PART OF THE WORK.

20.3.6

CHECKING EFFECTIVENESS OF STRESS RELIEVING BY HARDNESS TESTS (BY DIGITAL HARDNESS TESTER OR OTHER APPROVED TEST METHODS AS PER BHEL ENGINEER'S INSTRUCTION) INCLUDING NECESSARY TESTING EQUIPMENTS IS WITHIN THE SCOPE OF THE WORK / SPECIFICATION.

20.3.7

ALL THE RECORDED GRAPHS FOR HEAT TREATMENT SHALL BE HANDED OVER TO BHEL/ IBR AUTHORITIES AND DUE CLEARANCES OBTAINED.

20.3.8

RESULTS OF THESE PROCESSES SHALL BE VERIFIED/ VALIDATED AS PER REQUIREMENTS OF BHEL/CLIENT.

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20.3 NON DESTRUCTIVE EXAMINATION:

20.3.1

CONTRACTOR SHALL PROVIDE ALL RESOURCES AND MAKE ALL ARRANGEMENTS FOR THE RADIOGRAPHIC EXAMINATION OF WELDS FOR THIS WORK FOR REASONS OF SAFETY; INVARIABLY THE RADIOGRAPHY WORK WILL BE CARRIED OUT AFTER THE NORMAL WORKING HOURS AND CLOSE OF OTHER SITE ACTIVITIES ONLY. IN THIS REGARD, THE CONTRACTOR HAS TO ADHERE TO THE SAFETY RULES / REGULATIONS LAID BY BARC AUTHORITIES FROM TIME TO TIME.

20.3.2

RADIOGRAPHY INSPECTION OF WELDS SHALL BE PERFORMED IN ACCORDANCE WITH REQUIREMENTS AND RECOMMENDATION OF BHEL ENGINEER. THE MINIMUM QUANTUM OF RADIOGRAPHIC INSPECTION SHALL BE AS PER PROVISION OF IBR/BHEL'S ERECTION DOCUMENTS. THEY MAY, HOWEVER BE INCREASED DEPENDING UPON THE PERFORMANCE OF THE INDIVIDUAL WELDER AT THE DISCRETION OF BHEL ENGINEER/BOILER INSPECTING AUTHORITY. BIDDER SHALL ALSO ARRANGE THE UT EQUIPMENT WITH RECORDING FACILITY AT HIS OWN COST. USAGE OF UT EQUIPMENT SHALL BE AS PER DIRECTION OF BHEL ENGINEER. RECORDS OF UT SHALL BE PRODUCED AS PER SITE REQUIREMENT.

20.3.3

ALL X-RAY / GAMMA RAY FILMS OF WELD JOINTS SHALL BE PRESERVED PROPERLY AND BE HANDED OVER TO BHEL AND REQUISITE CLEARANCES SHALL BE OBTAINED BY THE CONTRACTOR.

20.3.4

THE FIELD WELDED JOINTS SHALL BE SUBJECT TO DYE-PENETRANT/MPT/RT/ OTHER NON-DESTRUCTIVE EXAMINATION AS SPECIFIED IN THE RESPECTIVE ENGINEERING DOCUMENTS/ AS INSTRUCTED BY BHEL.

20.3.5

WHEREVER REQUIRED, SURFACE PREPARATION, LIKE SMOOTH GRINDING OF WELDED AREA, PRIOR TO RADIOGRAPHY SHALL BE DONE. IT MAY ALSO BECOME NECESSARY TO ADOPT INTER-LAYER RADIOGRAPHY/MPT/UT DEPENDING UPON THE SITE/ TECHNICAL REQUIREMENT NECESSITATING INTERRUPTIONS IN CONTINUITY OF THE WORK AND MAKING NECESSARY ARRANGEMENTS FOR CARRYING OUT THE ABOVE WORK. THE CONTRACTOR SHALL TAKE ALL THIS INTO ACCOUNT IN HIS OFFER. THE REQUIRED NDT METHOD/PROCEDURE WILL BE DECIDED BY BHEL ENGINEER AT SITE.

20.3.6

TENDERER SHALL NOTE THAT 100% RADIOGRAPHY SHALL BE TAKEN ON ALL HIGH PRESSURE WELDING TILL SUCH TIME THE WELDERS' PERFORMANCE IS FOUND BY BHEL ENGINEERS TO BE SATISFACTORY. SUBSEQUENTLY, SUBJECT TO CONSISTENCY IN WELDER'S PERFORMANCE, THE PERCENTAGE OF RADIOGRAPHY WILL BE BASED ON BHEL'S STANDARD PRACTICE/CODE REQUIREMENT. THE DEFECTS SHALL BE RECTIFIED IMMEDIATELY AND TO THE SATISFACTION OF

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BHEL ENGINEER. THE DECISION OF BHEL ENGINEER REGARDING ACCEPTANCE / REJECTING THE JOINTS WILL BE FINAL AND BINDING ON THE CONTRACTOR.

20.3.7

100% RADIOGRAPH OF CERTAIN SIZES IN PIPING HAVE TO BE TAKEN AS PER BHEL STANDARDS/DRAWINGS.

20.3.8

FOR CARRYING OUT ULTRASONIC TESTING OF WELDING JOINTS OF LARGE SIZE TUBES AND PIPES, IT WILL BE NECESSARY TO PREPARE SURFACE BY GRINDING AND BUFFING A SMOOTH FINISH AND CONTOUR AS NECESSARY. THE CONTRACTOR'S SCOPE OF WORK INCLUDES SUCH PREPARATION AS INCIDENTAL TO WORK.

20.3.9

CONTRACTOR MAY HAVE TO UNDERTAKE RADIOGRAPHY WITH COBALT-60 ISOTOPE CAMERA IN CERTAIN CASES. HOWEVER, FOR ANY REASON IF USE OF COBALT-60 IS NOT POSSIBLE THEN THESE JOINTS SHALL BE CHECKED BY RADIOGRAPHY AFTER COMPLETION OF WELDING UP TO SUITABLE PART OF THICKNESS WITH IR-192 OTHER SUITABLE SOURCE SUBSEQUENTLY AFTER COMPLETING THE JOINT UT TO BE DONE. FOR THIS CONTRACTOR HAS TO DEPLOY LEVEL-II OPERATOR CERTIFIED BY BARC.

20.3.10

NO SEPARATE PAYMENT FOR ANY NDE ACTIVITIES (INCLUDING RADIOGRAPHY) WILL BE MADE.

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21.0 CONDENSER INSTALLATION

21.0.1

THE SHELL ASSEMBLY FOR EACH UNIT (WITH SHELL, TUBE SHEET, SUPPORT PLATES, SPACERS ETC) WEIGHING ABOUT 41 MT WILL BE DISPATCHED IN ASSEMBLED CONDITION. HOWEVER OTHER PARTS LIKE CONDENSER TUBES, HOT WELL ASSY, DOME ASSY, STRAND PIPES, SURGE PIPES, COLLAR/SLEEVE PIPE, TOP CONNECTING PIECE, STAINLESS STEEL BELLOWS, FOUNDATION PARTS, AIR EXTRACTION PIPES, ETC-WILL BE SENT LOOSE. THE ASSEMBLED CONDENSER SHELL ASSY IS TO BE HANDLED AT SITE INCLUDING UNLOADING FROM THE TRAILER, TRANSPORTATION TO SITE OF WORK, LIFTING, POSITIONING & PLACEMENT ON FOUNDATION IN TURBINE HALL BY CONTRACTOR USING HIS OWN REQUIRED CAPACITY CRANE/ SUITABLE ARRANGEMENT. ASSEMBLY AND WELDING OF OTHER LOOSE PARTS LIKE HOT-WELL, COLLAR/SLEEVE, SS BELLOWS STAND/SURGE PIPES, TOP CONNECTING PIPE TO TURBINE EXHAUST HOOD COUNTER FLANGE, INSERTION, EXPANSION, FLARING OF CONDENSER TUBES SHALL BE CARRIED OUT AT SITE. WELDING OF TOP CONNECTING PIPE TO COUNTER FLANGE OF TURBINE EXHAUST HOOD WILL BE CARRIED OUT AFTER FINAL ALIGNMENT AND LEVELLING OF TURBINE, & AS PER THE SEQUENTIAL WELDING PROCEDURE.

21.0.2

IT WILL REQUIRE CLEANING OF WATER SIDE SURFACE, OPENING OF MANHOLE/WATER BOX COVERS & RETIGHTEN THE SAME AFTER REPLACEMENT OF PACKING/GASKETS, CARRY OUT HYDRAULIC TEST & WATER FILL TEST ON STEAM SIDE AND WATER SIDE SPACE. ALL ABOVE SHALL BE CARRIED BY CONTRACTOR INCLUDING ATTENDING THE LEAKAGES (IF ANY) AS PART OF WORK UNDER THIS TENDER SPECIFICATION.

21.0.3

ALL WATER SIDE SURFACES OF WATER CHAMBERS SHALL BE PAINTED ONLY AFTER COMPLETION OF WORK AND WATER FILL TEST/ HYDRO TEST. WELDING & INTERFACING OF CONDENSER COOLING WATER CONNECTION FROM CUSTOMER TERMINAL POINT WILL BE DECIDED BY BHEL ENGINEER AT SITE AND SHALL BE BINDING ON CONTRACTOR.

21.0.4

FOR SURFACE PREPARATION, THE WATER BOXES ETC., MAY HAVE TO BE SAND/SHOT BLASTED TO REMOVE ALL TRACES OF SHOP COAT OF PRIMER. THE SPECIFIED PRIMER & PROTECTIVE PAINT AS SPECIFIED (QUALITY AND FINAL DRY FILM THICKNESS) IN ERECTION DOCUMENTS SHALL BE APPLIED. PRIMER AND PAINT SHALL BE PROVIDED BY THE CONTRACTOR.

22.0 TURBO BLOWER INSTALLATION

22.0.1

BLOWER OF EACH UNIT WEIGHING ABOUT 60 MT WILL BE DISPATCHED FROM BHEL MANUFACTURING UNIT IN FULLY ASSEMBLED CONDITION ON PERMANENT BASE FRAME. CONTRACTOR SHALL HAVE TO CARRY OUT FURTHER WORKS LIKE UNLOADING, LOCAL TRANSPORTATION UP TO FOUNDATION, HANDLING, LIFTING, POSITIONING & PLACEMENT, FIXING AND ALIGNMENT ETC OF THE TURBO

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BLOWER ON FOUNDATION IN TURBINE HALL AND FURTHER ERECTION, TESTING & COMMISSIONING ACTIVITIES.

CONTRACTOR SHALL USE HIS OWN LIFTING TOOLS & TACKLES / CRANE OF SUITABLE CAPACITY WITH OTHER REQUIRED ARRANGEMENTS FOR THE ENTIRE SCOPE OF WORK. HOWEVER BHEL'S CUSTOMER IS HAVING ONLY ONE 60 / 10 T CAPACITY ELECTRIC OVERHEAD TRAVELLING (EOT) CRANE WITHIN THE TURBINE HALL AND FACILITY OF THIS EOT CRANE WILL BE EXTENDED FREE OF HIRE CHARGES FOR THE ERECTION OF TURBINES AND TURBO BLOWER EQUIPMENTS UNDER THIS TENDER SPECIFICATION DEPENDING ON AVAILABILITY, LIFTING CAPACITY, APPROACH & ACCESSIBILITY. NO CLAIMS ON ACCOUNT OF NON-AVAILABILITY OF BHEL/CLIENT'S CRANE SHALL BE ENTERTAINED AT ANY POINT OF TIME

23.0 STEAM TURBINES INSTALLATION

23.0.1

STEAM TURBINES ALONG WITH CASING, ROTOR, BEARINGS, BASE FRAME ETC. TOTAL WEIGHING ABOUT 50 MT FOR EACH UNIT WILL BE DISPATCHED IN ASSEMBLED CONDITION. THE SERVICES OF CUSTOMERS EOT CRANE OF CAPACITY 60 / 10 MT WILL BE EXTENDED FREE OF CHARGES SUBJECT TO ITS AVAILABILITY, ACCESSIBILITY, SUITABILITY AND APPROACHABILITY. THE KEEPING IN VIEW THE MARGINAL LIFTING & HANDLING CAPACITY OF CUSTOMER EOT CRANE FOR LIFTING OF STEAM TURBINE, CONTRACTOR MAY HAVE TO DISMANTLE THE TURBINE BASE FRAME, TOP COVER, BEARINGS ETC. CONTRACTOR SHALL CARRY OUT THIS JOB BY USING HIS OWN T&P AND FABRICATE SUITABLE TEMPORARY FIXTURE/SUPPORTS BY PROVIDING REQUIRED QUANTITY STEEL MATERIALS LIKE ISMB BEAM/ANGLES SECTIONS TO KEEP STEAM TURBINE ON THIS TEMPORARY SUPPORTS/FIXTURE AND RE-ASSEMBLE THE TURBINE ON DISMANTLED PERMANENT BASE FRAME AFTER THEIR LIFTING AND PLACEMENT ON FOUNDATION. CONTRACTOR SHALL UTMOST CARE TO DISMANTLE, FABRICATE TEMPORARY SUPPORT/FIXTURE AND RE-ASSEMBLE THE STEAM TURBINE AND ALL THESE WORKS SHALL BE THE PART OF SCOPE OF ERECTION. CONTRACTOR SHALL HAVE TO CARRY OUT FURTHER WORKS LIKE HANDLING, LIFTING, POSITIONING & PLACEMENT OF THE STEAM TURBINE ON FOUNDATION IN TURBINE HALL AND FURTHER ERECTION, TESTING & COMMISSIONING WORKS.

23.0.2

GEAR BOX, FOUNDATION PARTS/BASE PLATES, TURBO-VISORY INSTRUMENTS LIKE PROXIMITORS/PROBES AND OTHER ASSOCIATED ITEMS/AUXILIARIES WILL BE SENT LOOSE SEPARATELY. CONTRACTOR SHALL CARRY OUT ERECTION, ASSEMBLY, PROVIDING PROTECTIVE FLEXIBLE CONDUIT AS REQUIRED FOR SUCH INSTRUMENTS LIKE PROXIMITORS/PROBES, RTDS ETC AND TESTING.

24.0 OTHER ROTATING MACHINES INSTALLATION

24.0.1

ALL ROTATING MACHINERY AND EQUIPMENTS SHALL BE CLEANED, LUBRICATED, CHECKED FOR THEIR SMOOTH ROTATION, IF NECESSARY, BY DISMANTLING AND RE-FITTING BEFORE ERECTION. IF IN THE OPINION OF BHEL ENGINEER, THE EQUIPMENT IS TO BE CHECKED FOR CLEARANCES, TOLERANCES AT ANY STAGE OF THE WORK OR DURING TESTING, PRE-COMMISSIONING, FACILITIES FOR

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DISMANTLING, CLEANING, LUBRICATING AND RE-FITTING SHALL BE PROVIDED BY THE CONTRACTOR. ALL ROTATING MACHINES SHAFT SHALL BE ROTATED PERIODICALLY TO AVOID BOWING OF SHAFTS.

24.0.2

TRIAL RUN OF THE DRIVE IN UN-COUPLED STATE AND THEN COUPLED WITH EQUIPMENT HAS TO BE DONE AFTER NECESSARY ALIGNMENT ETC

24.0.3

FORCED LUBE OIL SYSTEMS OF MOTORS AND/OR ROTATING EQUIPMENTS FORM THE PART OF WORK UNDER THIS SPECIFICATION

24.0.4

PERFORMANCE OF HYDRO TEST OF OIL COOLERS AND AIR COOLERS OF ROTATING MACHINES, IF ANY, IS INCLUDED IN THE SCOPE OF WORK.

24.0.5

DURING CHARGING OF SYSTEM IF ANY LEAKAGE IS FOUND IN OIL COOLER, AIR COOLER, SAME SHALL BE ATTENDED BY CONTRACTOR. BHEL WILL PROVIDE NECESSARY GASKETS ETC.

24.0.6

CERTAIN ROTATING MACHINERY AFTER, INITIAL RUNS AND COMMISSIONING OF THE EQUIPMENT, MAY HAVE TO BE HOT ALIGNED.

24.0.7

PROTECTIVE LUBRICANT COATS/FILL PROVIDED ON THE CRITICAL AREA OF EQUIPMENTS HAVE TO REMOVED AT APPROPRIATE STAGE AND REGULAR LUBRICANTS, AFTER REMOVAL/CLEANING OF PROTECTIVE COAT/FILL, AS PER SPECIFICATIONS SHOULD BE FILLED/APPLIED. CLEANING/FLUSHING AGENTS/OILS WILL BE PROVIDED BY BHEL.

24.0.8

AFTER INITIAL TRIAL OF ROTATING EQUIPMENTS, CONTROL AND POWER CABLING FOR MOTORS AND OTHER EQUIPMENTS/INSTRUMENTATION MAY HAVE TO BE DISCONNECTED FOR CHECKING ALIGNMENT AND RE-SETTING / RE-ALIGNMENT / HOT-ALIGNMENT. CONTRACTOR WILL HAVE TO ARRANGE LABOUR FOR DISCONNECTING CONTROL AND POWER CABLING AS PER BHEL ENGINEER'S INSTRUCTIONS AND CLEARANCE AND RECONNECT THE CONTROL AND POWER CABLING AFTER RE-ALIGNMENT, QUOTED TONNAGE RATE SHALL BE INCLUSIVE OF THE ABOVE.

24.0.9

EVEN THOUGH ROTATING MACHINES MAY BE GROUTED TO FOUNDATION USING NON-SHRINK GROUT MIX, BLUE MATCHING OF PACKER PLATES/SHIMS WITH FOUNDATION/BETWEEN PACKERS/EQUIPMENT BASE SHOULD BE DONE WHEREVER INSTRUCTED BY BHEL ENGINEER.

24.0.10

VITAL CLEARANCES OF SHOP ASSEMBLED ROTATING MACHINES SHOULD BE CHECKED AT SITE AND ADJUSTED IF REQUIRED.

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25.0 TESTING, PRE-COMMISSIONING, COMMISSIONING AND PG TEST

25.0.1

TESTING, PRE-COMMISSIONING, & COMMISSIONING WILL INVOLVE, THOUGH NOT LIMITED TO THESE, VARIOUS TESTING, TRIAL RUNS OF VARIOUS EQUIPMENTS ERECTED AND SYSTEMS INSTALLED, FLUSHING OF THE LINES BY AIR, OIL OR STEAM AS THE CASE MAY BE, CHEMICAL CLEANING OF VARIOUS SYSTEMS & PIPING, OIL-FLUSHING, STEAM BLOWING OF THE PIPE LINES, STEAM ROLLING, COMBINED OPERATION, TRIAL OPERATION ETC, ARE SOME OF THESE ACTIVITIES. ALL THE ACTIVITIES FOR COMMISSIONING OF THE SET, AS INFORMED BY BHEL FROM TIME TO TIME SHALL BE COMPLETED.

25.0.2

ALL THE ABOVE TESTS MAY HAVE TO BE REPEATED TILL ALL THE EQUIPMENTS SATISFY THE REQUIREMENT/ OBLIGATIONS OF BHEL TO THEIR CLIENT AND ALSO THE RELEVANT STATUTORY AUTHORITY.

25.0.3

FOR THE PURPOSE OF CHEMICAL CLEANING, STEAM BLOWING, OIL FLUSHING & HYDRAULIC TEST OF PIPING, CONTRACTOR SHALL LAY/INSTALL NECESSARY TEMPORARY PIPING, VALVES FOR CONDUCT OF HYDRAULIC TEST, OIL FLUSHING, CHEMICAL CLEANING, STEAM BLOWING ETC THIS MAY INVOLVE CUTTING OF SOME PORTION OF EXISTING PIPING/VALVES, PLACING OF RUBBER WEDGES/ BLANKS IN THE VALVES AND OTHER OPENINGS, INSTALLATION OF TEMPORARY TANKS FOR CHEMICAL MIXING, TEMPORARY ACCESS PLATFORMS TO MIXING TANKS ETC WHERE REQUIRED, BENDS HAVE TO BE FABRICATED AT SITE FROM RUNNING LENGTH OF PIPE. TEMPORARY INSTALLATION ITSELF HAS TO BE TESTED, TRIED, AND SUBJECT TO NON-DESTRUCTIVE EXAMINATIONS AS PER THE INSTRUCTIONS OF BHEL AS PART OF WORK.

25.0.4

ALL MATERIALS, EQUIPMENTS NECESSARY FOR INSTALLATION OF TEMPORARY SYSTEM AS ABOVE WILL BE SUPPLIED BY BHEL IN RANDOM SIZES/LENGTHS. HOWEVER, SERVICING, FABRICATION, ERECTION, DISMANTLING OF THE SAME AFTER COMPLETION OF THE PROCESS, AND HANDING OVER BACK TO BHEL STORES WILL BE THE RESPONSIBILITY OF THE CONTRACTOR. ALL TEMPORARY DUMMY/BLANK FLANGES, FITTINGS & FIXTURES AND TEMPORARY SUPPORTS REQUIRED TO CARRY OUT STEAM BLOWING, CHEMICAL CLEANING, OIL FLUSHING AND HYDRAULIC TEST WILL BE ARRANGED BY CONTRACTOR.

25.0.5

FABRICATION, FIT-UP, WELDING, AND POST-WELD-HEAT TREATMENT IF ANY, OF REQUISITE BLANKS FOR CONDUCT OF HYDRAULIC TEST IS PART WORK. SIMILARLY, REMOVAL OF BLANKS, RESTORATION AND NORMALISATION OF THE CONCERNED SYSTEM/LINE IS TO BE DONE AS PART OF WORK. BHEL WILL PROVIDE THE MATERIAL FOR BLANKS FREE OF CHARGE. NO SEPARATE PAYMENT IS ENVISAGED FOR THESE ACTIVITIES.

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25.0.6

OVERHAULING, CLEANING, SERVICING OF TANKS, PUMPS, EQUIPMENTS, VALVES, DURING ERECTION AND COMMISSIONING STAGES ARE IN THE SCOPE OF WORK. GASKETS, PACKING FOR REPLACEMENT WILL BE PROVIDED BY BHEL.

25.0.7

AFTER CHEMICAL CLEANING/PICKLING OF LUBRICATING SYSTEM (INCLUDING OIL PIPING, OIL TANK AND OTHER FITTINGS) OF STEAM TURBINES, TURBO BLOWERS, ROTATING MACHINES ETC, OIL FLUSHING FOR LUBRICATING SYSTEMS AS PER INSTRUCTIONS OF BHEL ENGINEER SHALL BE CARRIED OUT. CLEANING OF OIL TANK OF LUBRICATING OIL SYSTEM BEFORE AND AFTER OIL FLUSHING IS IN THE SCOPE OF WORK.

25.0.8

BHEL PSWR WILL PROVIDE OIL FOR FLUSHING, FRESH OIL FOR FILLING & TOPPING, UP TO TRAIL OPERATION COMPLETION. RECEIPT & HANDLING AT STORE/STORAGE YARD AND TAKING THE DELIVERY OF FLUSHED OIL, FRESH OIL BARRELS FROM STORES/STORAGE YARD FOR ENTIRE OPERATIONS OF FLUSHING, FILLING & TOPPING UP, RETURNING OF FLUSHED OIL, FRESH OIL EMPTY/UNUSED/PARTLY USED BARRELS ETC. TO BHEL STORES AFTER COMPLETION OF OPERATIONS SHALL BE THE PART THE SCOPE OF WORK. NO SEPARATE PAYMENT ON THIS ACCOUNT WILL BE MADE. SIMILARLY, FOR VARIOUS PRE-COMMISSIONING/ COMMISSIONING ACTIVITIES / PROCESSES MENTIONED IN VARIOUS CLAUSES, TRANSPORT OF CHEMICALS FROM BHEL/ CUSTOMER'S STORES, CHARGING OF CHEMICALS INTO THE SYSTEM AND RETURNING OF REMAINING AND/OR THE EMPTY CONTAINERS OF THE CHEMICALS TO CUSTOMER/BHEL STORES IS THE RESPONSIBILITY OF THE CONTRACTOR.

25.0.9

DURING PRE-COMMISSIONING/ COMMISSIONING, REPLACING/ CHANGING MECHANICAL/ OTHER SEALS OF EQUIPMENTS, PUMPS, REMOVAL AND CLEANING/REPLACING OF FILTERS ETC IS WITHIN THE SCOPE OF WORK. ITEMS REQUIRED FOR REPLACEMENT/CHANGE WILL BE PROVIDED BY BHEL.

25.0.10

IN CASE ANY DEFECT IS NOTICED DURING TESTS, TRIAL RUNS OF STEAM TURBINES AND TURBO-BLOWER SETS & ITS AUXILIARIES 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 SAME SHALL BE DONE AS PER BHEL ENGINEER'S INSTRUCTIONS. CLAIM, IF ANY, FOR THESE WORKS FROM THE CONTRACTOR SHALL BE GOVERNED AS PER RELEVANT CLAUSES OF GCC

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25.0.11

CONTRACTOR SHALL CUT/OPEN WORK, IF NEEDED, AS PER BHEL ENGINEER'S INSTRUCTIONS DURING COMMISSIONING FOR INSPECTION, CHECKING AND MAKE GOOD THE WORKS AFTER INSPECTION IS OVER.

I)

SIMILARLY, DURING THE COURSE OF ERECTION, IF CERTAIN PORTION OF EQUIPMENT'S ERECTED BY THE CONTRACTOR HAS TO BE UNDONE FOR ENABLING OTHER CONTRACTORS/AGENCIES OF BHEL/CUSTOMER TO CARRY OUT THEIR WORK, CONTRACTOR SHALL CARRY OUT SUCH JOBS EXPEDITIOUSLY AND PROMPTLY AND MAKE GOOD THE JOB AFTER COMPLETION OF WORK BY OTHER CONTRACTOR'S/ AGENCIES OF BHEL/CUSTOMER AS PER BHEL ENGINEER'S/AGENCIES OF BHEL/CUSTOMERS INSTRUCTIONS. CLAIMS, IF ANY, IN THIS REGARD SHALL BE GOVERNED AS PER RELEVANT CLAUSES OF GCC

25.0.12

DURING THIS PERIOD, THOUGH BHEL/ CLIENT'S STAFF WILL ALSO BE ASSOCIATED IN THE WORK, THE CONTRACTOR'S RESPONSIBILITY WILL BE TO ARRANGE FOR COMPLETE REQUIREMENT OF MEN AND REQUIRED TOOLS AND PLANTS, CONSUMABLES, SCAFFOLDING AND APPROACHES ETC, TILL SUCH TIME THE COMMISSIONED UNIT IS TAKEN OVER BY BHEL'S CLIENT.

25.0.13

COMMISSIONING ACTIVITIES WILL CONTINUE TILL THE COMPLETION OF TRIAL RUN/PG TEST FOR ERECTION WORKS. DURING THIS PERIOD CONTRACTOR SHALL MAKE AVAILABLE THE SERVICES OF SEPARATE DEDICATED LABOUR-FORCE COMPRISING OF SUITABLE SKILLED AND SEMI/UN-SKILLED HANDS ALONG WITH NECESSARY TOOLS AND PLANTS, CONSUMABLES ETC

25.0.14

IT SHALL BE SPECIFICALLY NOTED THAT THE CONTRACTOR MAY HAVE TO WORK ROUND THE CLOCK DURING THE PRE-COMMISSIONING AND COMMISSIONING PERIOD ALONG WITH BHEL ENGINEERS AND HENCE CONSIDERABLE OVERTIME PAYMENT IS INVOLVED. THE CONTRACTOR'S QUOTED RATES SHALL BE INCLUSIVE OF ALL THESE FACTORS.

25.0.15

THE CONTRACTOR SHALL CARRY OUT ANY OTHER TESTS AS DESIRED BY BHEL ENGINEER ON ERECTED EQUIPMENT COVERED UNDER THE SCOPE OF THIS CONTRACT DURING TESTING, PRE-COMMISSIONING AND COMMISSIONING, TO DEMONSTRATE THE COMPLETION OF ANY PART OR WHOLE OF WORK PERFORMED BY THE CONTRACTOR.

25.0.16

ASSISTANCE FOR PG TEST

THE CONTRACTOR SHALL PROVIDE ASSISTANCE FOR CONDUCTING PERFORMANCE GUARANTEE (PG) TEST TO BHEL AS A PART OF HIS REGULAR SCOPE OF WORK. THIS SHALL INCLUDE MANPOWER

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ASSISTANCE, SMALL T&P, PROVIDING ACCESS PLATFORMS/ SCAFFOLDING/LADDERS, LIGHTING ARRANGEMENTS AND OTHER ENABLING FACILITIES ASSOCIATED WITH TYPICAL PG TEST ACTIVITY.

26.0 PAINTING

26.0.1

COMPONENTS OF THE STEAM TURBINES & TURBO-BLOWER BOILERS WITH ASSOCIATED AUXILIARIES, PIPING AND OTHER EQUIPMENTS WITH ACCESSORIES ETC. WILL IN GENERAL BE SUPPLIED BY BHEL WITH ONE COAT OF PRIMER AND TWO COATS OF FINISH PAINT APPLIED AT THE MANUFACTURING SHOP; CONTRACTOR SHALL APPLY ONE COAT OF FINISH PAINT ON ALL SUCH COMPONENTS (WHICH ARE NOT INSULATED) AFTER ERECTION AT SITE UNLESS AND OTHERWISE THE SHOP COATING IS DAMAGED IN THE MEANWHILE. THE TENTATIVE TYPES OF PAINTS INVOLVED FOR FINAL PAINTING ARE SYNTHETIC ENAMEL, EPOXY, HEAT RESISTANT ALUMINIUM, CHLORINATED RUBBER PAINTS ETC. HOWEVER, THE FINAL TYPE OF PAINTS AND THICKNESS OF COATS SHALL BE AS PER DRAWINGS & CUSTOMER REQUIREMENTS AT SITE.

26.0.2

IN ADDITION TO COMPONENTS/EQUIPMENT AS ABOVE, THERE COULD BE LIMITED FEW WITHOUT ANY PRIOR PROTECTIVE COATING. SUCH COMPONENTS SHALL FIRST BE THOROUGHLY CLEANED OF ALL DIRT, RUST, SCALE, GREASE, OIL AND OTHER SURFACE DEPOSITS BY WIRE BRUSHING, SCRAPING, WASHING, WIPING WITH SOLVENT OR ANY APPROPRIATE METHOD AND THE SAME BEING INSPECTED AND APPROVED BY BHEL FOLLOWED BY APPLICATION OF ONE COAT OF PRIMER. AFTERWARDS, THE ABOVE PARTS SHALL BE OVER-COATED WITH TWO LAYERS OF SPECIFIED PAINT AS PER APPLICATION PROCEDURE PRESCRIBED BY THE PAINT MANUFACTURER.

26.0.3 TOUCH-UP PAINTING ON DAMAGED AREAS -

a) FOR COATINGS DAMAGED UP TO METAL SURFACE

SURFACE PREPARATION SHALL BE CARRIED OUT BY MANUAL CLEANING. MINIMUM 6 INCHES ADJOINING AREA WITH EXISTING COATING SHALL BE ROUGHENED BY WIRE BRUSHING, EMERY PAPER RUBBING ETC., FOR BEST ADHESION OF PATCH PRIMER.

PRIMER COAT OF TOUCH-UP PRIMER TO BE APPLIED BY BRUSH IMMEDIATELY AFTER THE SURFACE PREPARATION.

OVER THIS PRIMER COAT, FINISH COAT AND FINAL FINISH COAT SHALL BE APPLIED AS COVERED ABOVE BY BRUSH WITHIN MAXIMUM SEVEN (7) DAYS OF APPLICATION OF TOUCH UP PRIMER.

FOR EXECUTION ONLY THE LATEST DOCUMENT SHALL BE APPLICABLE AND NO CLAIM WHATSOEVER SHALL BE ENTERTAINED IN CASE OF ANY VARIANCE BETWEEN SUCH DOCUMENTS. SIMILARLY, DOCUMENTS AS PROVIDED PROGRESSIVELY DURING THE

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EXECUTION OF WORK FOR ALL OTHER PRODUCTS/ EQUIPMENTS ETC SHALL BE APPLICABLE.

26.0.4

PAINTING OF WELDED AREAS / PAINTING OF AREAS EXPOSED AFTER REMOVAL OF TEMPORARY SUPPORTS / TOUCH-UP PAINTING ON DAMAGED AREAS OF EMPLOYER'S STRUCTURES, WHERE INTER-CONNECTION, WELDING / MODIFICATION ETC. HAS BEEN CARRIED OUT BY THE BIDDER.

- (A.) CLEAN THE SURFACE TO REMOVE FLUX SPATTERS AND LOOSE RUST, LOOSE COATINGS IN THE ADJOINING AREAS OF WELD SEAMS BY WIRE BRUSH AND EMERY PAPER.
- (B.) PAINTING PROCEDURE TO BE FOLLOWED AS MENTIONED ABOVE FOR TOUCH-UP PAINTING ON DAMAGED AREAS.

26.0.5

THE SCOPE OF WORK INCLUDES PAINTING OF COLOUR BANDS, LETTERING, MARKING AND SIGNS FOR DIRECTION OF FLOW/ROTATION, NAMES ETC OF APPROVED COLOURS AS PER THE STANDARD COLOUR CODES AND SPECIFICATIONS SPECIFIED IN TENDER SPECIFICATION OR AS ADVISED BY BHEL/CUSTOMER ENGINEER AT SITE FOR THE EQUIPMENTS/ COMPONENTS COVERED IN THESE SPECIFICATIONS. APPLICABLE PAINTS AND PRIMER SHALL BE SUPPLIED BY BHEL.

26.0.6

ALL EXPOSED METAL PARTS OF THE EQUIPMENT INCLUDING PIPING, STRUCTURES, HAND RAILING, GRATING ETC SHALL BE THOROUGHLY CLEANED OFF DUST, RUST, SCALES AND OTHER FOREIGN MATERIALS BY MANUAL OR MECHANIZED WIRE BRUSHING, SCRAPPING, SAND BLASTING ETC AND THE SAME BEING INSPECTED AND APPROVED BY BHEL/CUSTOMER ENGINEER BEFORE APPLICATION OF PRIMER. AFTERWARDS, THE ABOVE PARTS SHALL BE FINISH PAINTED WITH SPECIFIED NUMBER OF COATS AS PER SPECIFICATION.

26.0.7

IN CERTAIN ISOLATED INSTANCES WHERE IT IS NOT POSSIBLE TO CLEAN THE EQUIPMENTS AS EXPLAINED ABOVE, CLEANING BY GRINDING MIGHT HAVE TO BE RESORTED TO. NO DAMAGE TO THE EQUIPMENT/COMPONENTS SHOULD BE CAUSED.

26.0.8

SURFACE TO BE PAINTED SHOULD BE FREE OF OIL AND GREASE. IT SHOULD BE REMOVED BY USING SUITABLE CLEANING AGENTS INCLUDING PERMITTED SOLVENTS. SURFACE CLEANED BY CHEMICAL AGENT, IF REQUIRED, SHALL BE TREATED FURTHER AS PRESCRIBED IN USE OF SUCH CLEANING AGENTS. THE CONTRACTOR AT HIS OWN COST SHALL PROVIDE ALL THE CONSUMABLES AND APPLICATION IMPLEMENTS.

26.0.9

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DURING THE PREPARATION OF SURFACE, IF THE SHOP COAT IS DAMAGE BY CHEMICAL CLEANING OR BY MECHANICAL MEANS, CONTRACTOR SHALL REPAIR THE SAME FREE OF COST TO BHEL. BHEL WILL MAKE AVAILABLE ONLY THE PRIMER AND PAINTS FREE OF ANY CHARGE TO CONTRACTOR.

26.0.10

SPECIFIED DRYING TIME SHALL BE PERMITTED FROM ONE TO ANOTHER COAT.

26.0.11

THE WORK SPREAD IS ALSO SUBSTANTIAL INVOLVING SUBSTANTIAL RUN OF STRUCTURES AND PIPING. CONTRACTOR SHALL TAKE SUFFICIENT PRECAUTIONS TO AVOID ANY ACCIDENT AND HAZARD IN ALL RESPECTS. THE ROPES, LADDERS, SCAFFOLDING MATERIALS, CLAMPS ETC AND CLIMBER USED SHOULD BE OF STANDARD QUALITY FOR SAFE AND SMOOTH EXECUTION OF WORK.

26.0.12

CONTRACTOR SHALL CARRY OUT THE WORK IN SUCH A WAY THAT OTHER ERECTED EQUIPMENT, STRUCTURE, CIVIL FOUNDATIONS AND OTHER PROPERTY ARE NOT DAMAGED. FOR DAMAGES IN ANY OF SUCH CASES DUE TO LAPSES BY CONTRACTOR, BHEL SHALL HAVE THE RIGHT TO RECOVER THE COST OF SUCH DAMAGES FROM THE CONTRACTOR.

26.0.13

CONTRACTOR SHALL TAKE DUE CARE TO COVER/PROTECT THE EQUIPMENT WHICH ARE ALREADY PAINTED WHILE CARRYING OUT THE PAINTING OF OTHER ADJACENT EQUIPMENT. IF SO HAPPENS, IT SHALL BE CLEANED AND REPAINTED BY THE CONTRACTOR WITHOUT ANY EXTRA CHARGES.

26.0.14

IN GENERAL, PAINTING OF STRUCTURAL PARTS AND COLOUR BANDS, LETTERING, MARKING OF DIRECTION OF FLOW/ROTATION ETC WILL BE CARRIED OUT BY BRUSH PAINTING. HOWEVER, AREAS/EQUIPMENTS INACCESSIBLE FOR MANUAL PAINTING HAVE TO BE PAINTED BY SPRAY PAINTING. THE DECISION OF BHEL ENGINEER, IN THIS REGARD, SHALL BE FINAL AND BINDING ON THE CONTRACTOR. FOR THE PURPOSE OF SPRAY PAINTING, AIR AT ONE POINT WILL BE MADE AVAILABLE BY BHEL FREE. LAYING OF AIR HOSE PIPE AND ANY OTHER LINE REQUIRED SHALL BE DONE BY CONTRACTOR AT HIS COST. THE CONTRACTOR SHALL PROVIDE SPRAY EQUIPMENT SET.

26.0.15

THE CONTRACTOR SHALL PROVIDE ALL THE NECESSARY SCAFFOLDING MATERIALS, TEMPORARY STRUCTURES AND NECESSARY SAFETY DEVICES ETC, DURING EXECUTION OF THE WORK.

26.0.16

FINAL PAINTING WORK SHALL BE STARTED AFTER OBTAINING CLEARANCE FROM BHEL ENGINEERS AND AS PER HIS INSTRUCTIONS.

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PRIMER AND PAINTS FOR FINAL PAINTING

ALL PRIMER AND PAINTS REQUIRED FOR FINAL PAINTING SHALL BE SUPPLIED BY BHEL FREE OF CHARGES.

THE CONTRACTOR, HOWEVER, SHALL PROVIDE ACCOUNT OF ALL THE ITEMS ISSUED TO HIM AND RETURN ALL PRIMER, PAINTS ETC REMAINING EXTRA OVER THE NORMAL REQUIREMENT WITH PROPER IDENTIFICATION TAGS IN A PACKED CONDITION TO BHEL STORES. IN CASE OF ANY MISUSE OR EXCESS USE OVER THE NORMAL REQUIREMENT, BHEL RESERVES THE RIGHT TO RECOVER THE COST OF SUCH MISUSE/ EXCESS USE. DECISION OF BHEL ENGINEER IN THIS REGARD WILL BE FINAL AND BINDING ON THE CONTRACTOR.

24.0 GENERAL

24.0.1

STEAM PIPING, EXTRACTION PIPING, DRAIN LINE, OIL LINE, SERVICE AIR PIPING, COOLING AND SERVICE WATER LINES BETWEEN THE BHEL SUPPLIED EQUIPMENTS/ AUXILIARIES AND BATTERY LIMITS OF CUSTOMER IS IN THE SCOPE OF THIS TENDER SPECIFICATION.

24.0.2

IT MAY BE SPECIFICALLY NOTED THAT IT SHOULD NOT BE CONSTRUED OR CLAIMED BY THE CONTRACTOR THAT WITH THE TECHNICAL SPECIFICATION AND "EXCLUSIONS AND/OR INCLUSIONS" DETAILED IN THIS TENDER SPECIFICATION, BHEL HAS COVERED THE ENTIRE SCOPE OF WORK AND/OR THE DETAILS THEREOF TO BE EXECUTED BY THE CONTRACTOR.

24.0.3 **GENERAL RESPONSIBILITY OF THE CONTRACTOR**

THE CONTRACTOR SHALL HAVE TOTAL RESPONSIBILITY FOR ALL EQUIPMENT AND MATERIALS IN HIS CUSTODY AT CONTRACTOR'S STORES, LOOSE, SEMI-ASSEMBLED, ASSEMBLED OR ERECTED BY HIM AT SITE. HE SHALL EFFECTIVELY PROTECT THE FINISHED WORKS FROM ACTION OF WEATHER AND FROM DAMAGES OR DEFACEMENT AND SHALL ALSO COVER THE FINISHED PARTS IMMEDIATELY ON COMPLETION OF WORK AS PER BHEL ENGINEER'S INSTRUCTIONS. THE MACHINE SURFACES/FINISHED SURFACES SHOULD BE GREASED AND COVERED.

25.0 PRESERVATION & PROTECTION OF COMPONENTS

25.1

AT ALL STAGES OF WORK, EQUIPMENTS/MATERIALS IN THE CUSTODY OF CONTRACTOR, INCLUDING THOSE ERECTED, WILL HAVE TO BE PRESERVED AS PER THE INSTRUCTIONS OF BHEL. NECESSARY PRESERVATION AGENTS INCLUDING THE PRIMER & PAINT, FOR THE ABOVE WORK SHALL BE PROVIDED BY THE CONTRACTOR.

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25.2

THE CONTRACTOR SHALL MAKE SUITABLE SECURITY ARRANGEMENTS INCLUDING EMPLOYMENT OF SECURITY PERSONNEL AND ENSURE PROTECTION OF ALL MATERIALS/ EQUIPMENT IN THEIR CUSTODY AND INSTALLED EQUIPMENTS FROM THEFT/FIRE/PILFERAGE AND ANY OTHER DAMAGES AND LOSSES.

25.3

CONTRACTOR SHALL COLLECT ALL SCRAP MATERIALS PERIODICALLY FROM VARIOUS AREA OF WORK SITE, DEPOSIT THE SAME AT ONE PLACE EARMARKED AT SITE OR SHIFT THE SAME TO A PLACE EARMARKED IN BHEL/ CLIENT'S STORES. IN CASE OF FAILURE OF CONTRACTOR IN COMPLIANCE OF THIS REQUIREMENT, BHEL WILL MAKE SUITABLE ARRANGEMENT AT CONTRACTOR'S RISK AND COST.

25.4

THE ENTIRE SURPLUS, DAMAGED, UNUSED MATERIALS, PACKAGING MATERIALS / CONTAINERS, SPECIAL TRANSPORTING FRAMES, GUNNY BAGS, ETC SHALL BE RETURNED TO BHEL STORES BY THE CONTRACTOR.

25.5

THE CONTRACTOR SHALL NOT WASTE ANY MATERIALS ISSUED TO HIM. IN CASE IT IS OBSERVED AT ANY STAGE THAT THE WASTAGE/EXCESS UTILISATION OF MATERIALS IS NOT WITHIN THE PERMISSIBLE LIMITS, RECOVERY FOR THE EXCESS QUANTITY USED OR WASTED WILL BE EFFECTED WITH DEPARTMENTAL CHARGES FROM THE CONTRACTOR. DECISION OF BHEL ON THIS WILL BE FINAL AND BINDING ON THE CONTRACTOR.

25.6

FOR ANY CLASS OF WORK FOR WHICH NO SPECIFICATIONS HAVE BEEN LAID DOWN IN THESE SPECIFICATIONS, WORK SHALL BE EXECUTED AS PER THE INSTRUCTIONS OF BHEL.

26.0 COMMON REQUIREMENTS

26.0.1

ALL WELDED JOINTS SHOULD BE PAINTED WITH ANTICORROSIVE PAINT IMMEDIATELY AFTER COMPLETION OF RADIOGRAPHY AND STRESS RELIEVING WORKS. NECESSARY PAINTS AND OTHER CONSUMABLES FOR THE ABOVE WORK ARE IN THE SCOPE OF THE CONTRACTOR.

26.0.2

SUSPENSIONS/SUPPORTS FOR TUBES/PIPING, ETC, WILL BE SUPPLIED IN RUNNING/ RANDOM LENGTHS/ SIZES WHICH SHALL BE CUT TO SUITABLE SIZES AND ADJUSTED AS REQUIRED.

26.0.3

SPRING SUSPENSION/CONSTANT LOAD HANGERS MAY HAVE TO BE PRE-ASSEMBLED FOR REQUIRED LOAD AND ERECTION CARRIED OUT AS PER INSTRUCTIONS OF BHEL. ADJUSTMENTS, REMOVAL OF

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TEMPORARY ARRESTS/LOCKS, CUTTING OF EXCESS THREAD LENGTH OF HANGER TIE-ROD ETC, HAVE TO BE CARRIED OUT AS AND WHEN REQUIRED. LOAD SETTING OF SPRING HANGERS, AS PER BHEL'S DOCUMENTS/INSTRUCTIONS, DURING VARIOUS STAGES OF ERECTION & TESTING AND AFTER FLOATING OF PIPING/DUCTING DURING COLD AND HOT CONDITION WILL HAVE TO BE DONE. THIS EXERCISE MAY HAVE TO BE REPEATED TILL SATISFACTORY RESULTS ARE ACHIEVED.

26.0.4

LAYOUT OF FIELD ROUTED/ SMALL BORE PIPING SHALL BE DONE AS PER SITE REQUIREMENT. NECESSARY SKETCH FOR ROUTING THESE LINES SHOULD BE GOT APPROVED FROM BHEL BY THE CONTRACTOR. THERE IS A POSSIBILITY OF SLIGHT CHANGE IN ROUTING THE ABOVE PIPE LINES EVEN AFTER COMPLETION OF ERECTION.

26.0.5

WELDING OF NECESSARY INSTRUMENTATION TAPPING POINTS, THERMOCOUPLE PADS, ROOT VALVES, CONDENSING VESSELS, FLOW METERING & MEASUREMENT DEVICES, AND CONTROL VALVES TO BE PROVIDED ON STEAM TURBINES, TURBO-BLOWERS & ITS AUXILIARIES, INTEGRAL & EXTERNAL PIPE LINES COVERED WITHIN THE SCOPE OF THIS SPECIFICATION, WILL ALSO BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE DONE AS PER THE INSTRUCTIONS OF BHEL SITE ENGINEER. THE INSTALLATION OF ALL THE ABOVE ITEMS WILL BE CONTRACTOR'S RESPONSIBILITY EVEN IF THE :

I. ITEMS ARE NOT SPECIFICALLY INDICATED UNDER THE RESPECTIVE PRODUCT GROUPS AS GIVEN IN THE TECHNICAL SPECIFICATIONS.

II. ITEMS ARE SUPPLIED BY AN AGENCY OTHER THAN BHEL.

NDE, AND POST WELD HEAT TREATMENT FOR ABOVE SHALL BE DONE AS PER THE SPECIFICATIONS AS PART OF WORK.

26.0.6

FIXING AND SEAL WELDING OF THERMO-WELLS & PLUGS BEFORE HYDRO TEST/ STEAM BLOWING OF EQUIPMENT OR OTHER PIPING SYSTEM IS WITHIN THE SCOPE OF WORK. CONTRACTOR SHALL ALSO REMOVE THE SEAL WELDED PLUGS BY PROCESS OF GRINDING AND FIX AND SEAL WELD THERMO-WELLS AFTER HYDRO TEST/STEAM BLOWING OF LINES AS PART OF WORK.

26.0.7

ACTUATORS/DRIVES OF VALVES, DAMPERS, GATES, POWERED VANES ETC. MAY HAVE TO BE SERVICED, LUBRICATED, BEFORE ERECTION, DURING PRE-COMMISSIONING & COMMISSIONING, INCLUDING CARRYING OUT MINOR ADJUSTMENTS REQUIRED AS INCIDENTAL TO THE WORK.

26.0.8

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ALL ELECTRICAL MOTORS HAVE TO BE TESTED FOR IR&PI VALUES PRIOR TO THE TRIAL RUN. WHERE REQUIRED, DRY OUT MAY HAVE TO BE CARRIED OUT BY USING EXTERNAL HEATING SOURCE. CONTRACTOR SHALL MAKE ALL ARRANGEMENTS IN THIS REGARD AND COMPLETE THE WORK AS INSTRUCTED. BHEL WILL PROVIDE THE MOTORIZED INSULATION TESTERS.

27.0 INSULATION –

APPLICATION OF WOOL INSULATION, SHEET METAL CLADDING, WELDING OF STUDS/HOOKS/SUPPORTS FOR EQUIPMENTS, TANKS/VESSELS AND PIPINGS ETC. TO HOLD INSULATION COVERED UNDER THIS CONTRACT SHALL INCLUDE, BUT NOT LIMITED TO, THE FOLLOWING :-

27.0.1

REMOVABLE TYPE OF INSULATION TO BE PROVIDED FOR VALVES, EXPANSION JOINTS, ETC AS PER THE DRAWINGS OR AS DIRECTED BY BHEL ENGINEER.

27.0.2

WOOL INSULATION ARE RECEIVED AT SITE AS BONDED AND UN-BONDED MATTRESSES IN STANDARD SIZES. THESE ARE TO BE DRESSED/CUT TO SUIT WORK

27.0.3

APPLICATION OF INSULATION WORK AND SHEET METAL CLADDING AS GIVEN IN VARIOUS DRAWINGS/ SPECIFICATIONS OF BHEL. THE DOCUMENTS FOR FURTHER DETAILS OF INSULATION OF EQUIPMENTS LIKE SJAE, GSC, FLASH TANK, STEAM TURBINES ETC. WILL BE FURNISHED AT SITE.

27.0.4

ALUMINIUM/GI SHEET CLADDING BY FABRICATION OF ALUMINIUM/GI SHEETS TO THE SIZES AND SHAPES SPECIFIED IN DRAWINGS, BEADING, SWAGING, BEVELLING OF SHEETS, CROWNING THE SHEETS, IF NECESSARY, FIXING THE SAME TO SUPPORTS, OVER WOOL INSULATION WITH SCREWS/RETAINERS AS SPECIFIED IN BHEL DRAWINGS OR AS INSTRUCTED BY BHEL ENGINEER.

27.0.5

WELDING OF STUDS/HOOKS/SUPPORTS ON EQUIPMENT AND PIPING TO SUPPORT WOOL INSULATION, AS PER THE DRAWINGS OR AS INSTRUCTED BY BHEL ENGINEERS.

27.0.6

PAINTING THE INNER SIDE OF ALUMINIUM CLADDING, WITH ANTI-CORROSIVE PAINT AS SPECIFIED. THE REQUIRED PAINT AND THINNER & OTHER ACCESSORIES/ CONSUMABLES FOR PAINTING, CLEANING THE SURFACES ETC SHALL BE ARRANGED BY THE CONTRACTOR.

27.0.7

THE CONTRACTOR SHALL LEAVE CERTAIN GAPS AND OPENINGS WHILE DOING THE WORK AS PER THE INSTRUCTIONS OF BHEL ENGINEER TO FACILITATE INSPECTION OR DURING COMMISSIONING TO FIX

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GAUGES, FITTINGS, INSTRUMENTS. THESE GAPS WILL HAVE TO BE FINISHED AS PER DRAWINGS AT A LATER DATE BY THE CONTRACTOR AT NO EXTRA COST TO BHEL.

27.0.8

A LOG BOOK SHALL BE MAINTAINED BY THE CONTRACTOR FOR TAKING CLEARANCE OF THE LOCATION FOR APPLICATION OF REFRACTORY AND INSULATION.

I) **WASTAGE ALLOWANCE FOR INSULATION & CLADDING**

WASTAGE ALLOWANCE ON NET ISSUED QUANTITY FOR REFRACTORY & INSULATION SHALL BE AS FOLLOWS:

I)	WOOL MATTRESSES AND CLADDING SHEETS	2%
II)	IRON & OTHER RETAINERS/FASTENERS COMPONENTS	2%

NET ISSUED QUANTITY IS THE GROSS QUANTITY ISSUED LESS THE USEABLE QUANTITY RETURNED TO BHEL. ACCEPTANCE OF ANY MATERIAL AS USEABLE WILL BE AT ABSOLUTE DISCRETION OF BHEL ENGINEER.

J) EXCLUSION: SPRAY INSULATION OF TURBINES (IF APPLICABLE) IS EXCLUDED FROM THE SCOPE OF CONTRACTOR.

28.0 **PIPING INSTALLATION**

28.0.1

THE WORK ON PIPING SYSTEMS (AIR, WATER, OIL, STEAM, GAS ETC.) WILL INCLUDE FABRICATION, LAYING, EDGE PREPARATION, FIXING & WELDING OF THE ELBOWS/FITTINGS/ VALVES ETC ON THE LINE, FIXING & ADJUSTMENT OF SUPPORTS/ANGLES SHOCK ABSORBERS AND CARRYING OUT ALL OTHER ACTIVITIES/WORK TO COMPLETE THE ERECTION AND ALSO CARRYING OUT ALL PRE-COMMISSIONING/COMMISSIONING OPERATIONS MENTIONED IN THE SPECIFICATION AS PER BHEL ENGINEERS INSTRUCTIONS AND/OR AS PER APPROVED DRAWINGS/DOCUMENTS.

28.0.2

FITTINGS LIKE BENDS TEES, ELBOWS, REDUCERS, FLANGES ETC, WILL BE SUPPLIED AS LOOSE ITEMS WHICH SHALL BE MATCHED WITH THE CORRESPONDING PIPING. BENDS OF TUBE SIZE UP TO OD 65MM WILL HAVE TO BE FABRICATED AT SITE AT NO EXTRA COST.

28.0.3

ALL PIPES & TUBES SHALL BE SENT FROM UNITS IN COMMERCIALY AVAILABLE LENGTHS. CERTAIN ADJUSTMENTS IN LENGTH MAY BE NECESSARY WHILE ERECTING PIPELINES. THE CONTRACTOR SHOULD REMOVE THE EXTRA LENGTHS/ADD EXTRA LENGTHS TO SUIT THE FINAL LAYOUT AFTER PREPARING EDGES BOTH FOR IBR & NON-IBR PIPES AND ADOPTING SPECIFIED HEAT TREATMENT PROCEDURE AT NO EXTRA COST.

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28.0.4

MINOR ADJUSTMENTS LIKE REMOVAL OF OVALITY IN PIPES AND OPENING AND CLOSING OF THE BENDS OF PIPE BY PROCESS OF HEAT OR CORRECTION OF ANY OTHER METHOD APPROVED BY BHEL ENGINEER TO SUIT THE LAYOUT, WITH SPECIFIED HEAT TREATMENT PROCEDURE, ARE IN THE SCOPE OF WORK.

28.0.5

FLAME CUTTING OF PIPING, WHERE REQUIRED SHALL BE DONE AS PER BHEL ENGINEERS INSTRUCTIONS.

28.0.6

ALL DRAINS/ VENTS/ RELIEF/ ESCAPE/ SAFETY VALVE PIPING TO VARIOUS TANKS/ SEWAGE/ DRAIN CANAL/ FLASH BOX / SUMP / ATMOSPHERE ETC FROM THE STUBS ON THE PIPING AND EQUIPMENTS ERECTED BY THE CONTRACTOR IS COMPLETELY COVERED IN THE SCOPE OF WORK.

28.0.7

CONNECTION (EITHER FLANGED/BOLTED OR WELDED) OF PIPING TO THE TERMINAL POINTS/EQUIPMENTS ETC IS IN THE SCOPE OF WORK EVEN THOUGH SUCH TERMINAL POINT/EQUIPMENT MAY NOT FORM PART OF THIS WORK. ALL NDE INCLUDING RADIOGRAPHY OF JOINTS SO MADE, POST-WELD-HEAT-TREATMENT IF ANY, IS ALSO WITHIN THE SCOPE OF WORK/SPECIFICATION. TERMINAL POINTS WORKS OF VARIOUS PIPING SCHEMES WITH CUSTOMER LINES AND OTHER CONTRACTOR'S LINES. THE TERMINAL POINTS WORK IS INCLUSIVE OF CUTTING OF EXISTING LINES, EDGE PREPARATION, WELDING/BLANKING AND HOOK UP WORK.

28.0.8

ERECTION, WELDING & UT/RADIOGRAPHY TEST OF BHEL SUPPLIED FLOW NOZZLES IN CUSTOMER TERMINAL/TAPPING POINTS IS THE PART OF SCOPE OF WORKS. SAME WILL BE CARRIED OUT AS PER BHEL ENGINEER'S INSTRUCTION AT SITE AND SHALL BE BINDING ON CONTRACTOR.

28.0.9

DRILLING, WELDING OF STUBS FOR DRAINS, VENTS, INSTRUMENT TAPPING POINTS, WELDING OF ATTACHMENTS FOR SUPPORTS ETC IS PART OF THE WORK. NO ADDITIONAL PAYMENT IS ENVISAGED FOR THIS WORK.

28.0.10

ERECTION AND INSTALLATION OF MOTORISED VALVES & CONTROL VALVES SHALL BE TREATED AS PART OF PIPING WORK. NO SEPARATE RATE ON THIS ACCOUNT WILL BE PAYABLE.