Rev 01
1st Jun
2012

NOTICE INVITING TENDER

(Document No PS:MSX:NIT)

TENDER NO.: BHEL/NR/SCT/PANKI/FGD/1192

NAME OF WORK: ERECTION, TESTING, COMMISSIONING, TRIAL OPERATION, HANDING OVER AND FINAL PAINTING OF FGD & AUXILIARIES AT 1X660 MW PANKI THERMAL POWER PROJECT, PANKI, KANPUR, UTTAR PRADESH.

Bharat Heavy Electricals Limited

Registered

Ref: **BHEL/NR/SCT/PANKI/FGD/1192** Date: 05/05/2020

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

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To

Dear Sir/Madam

Sub : NOTICE INVITING E-TENDER

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

1. **Salient Features of NIT**

SL NO	ISSUE	DESCRIPTION	
i	**TENDER NUMBER**	**BHEL/NR/SCT/PANKI/FGD/1192**	
ii	**Broad Scope of job**	**ERECTION, TESTING, COMMISSIONING, TRIAL OPERATION, HANDING OVER AND FINAL PAINTING OF FGD & AUXILIARIES AT 1X660 MW PANKI THERMAL POWER PROJECT, PANKI, KANPUR, UTTAR PRADESH**	
iii	**DETAILS OF TENDER DOCUMENT**		
a	Volume-IA	*Technical Conditions of Contract (TCC) consisting of Scope of work, Technical Specification, Drawings, Procedures, Bill of Quantities, Terms of payment, etc*	*Applicable*
b	Volume-IB	*Special Conditions of Contract (SCC)*	*Applicable*
c	Volume-IC	*General Conditions of Contract (GCC)*	*Applicable*
d	Volume-ID	*Forms and Procedures*	*Applicable*
e	Volume-II	*Price Schedule (Absolute value).*	*Applicable*
iv	**Issue of Tender Documents**	**From BHEL website (www.bhel.com) and https://bhel.abcprocure.com** Tender documents will be available at website till due date of submission	*Applicable*
v	**DUE DATE & TIME OF OFFER SUBMISSION**	***Date : 16/03/2020, Time : 15:00 HRS*** ***Place : on https://bhel.abcprocure.com***	*Applicable*
vi	**OPENING OF TENDER**	***At due date / time*** ***Date : 16/03/2020, Time : 15:30 HRS*** *Notes:* *(1) In case the due date of opening of tender becomes a non-working day, then the due date & time of offer submission and opening of tenders get extended to the next working day.* *(2) Bidder may depute representative to witness the opening of tender.* ***However it being an e-tender it shall be opened online***	*Applicable*
vii	**EMD AMOUNT**	***Rs. 21,80,000/-.***	*Applicable*

viii	**COST OF TENDER**	*Rs 2000/-.*	*Applicable*
ix	**LAST DATE FOR SEEKING CLARIFICATION**	***Five days before bid submission due date.*** *Along with soft version also, addressing to contact address given below* ***1)*** *Name: **G.V. RAJA SEKHAR*** *Designation: Sr. Manager* *Deptt: SCT* *Address: BHEL-PSNR, PLOT NO. 25, SECTOR – 16A, NOIDA - 201301* *Phone: (Landline) 0120-2416232* *Email : gvr@bhel.in* ***2)*** *Name: **R M CHANDRA*** *Designation: Dy. Manager* *Deptt: SCT* *Address: BHEL-PSNR, PLOT NO. 25, SECTOR – 16A, NOIDA - 201301* *Phone: (Landline) 0120 - 2416440* *Email : rmchandra@bhel.in*	*Applicable*
x	**SCHEDULE OF Pre Bid Discussion (PBD)**		*Not applicable.*
xi	**INTEGRITY PACT & DETAILS OF INDEPENDENT EXTERNAL MONITOR (IEM)**	*Please refer clause no.15a.*	*Applicable.*
xii	**Latest updates**	Latest updates on the important dates, Amendments, Correspondences, Corrigenda, Clarifications, Changes, Errata, Modifications, Revisions, etc to Tender Specifications will be hosted in BHEL webpage (www.bhel.com -->Tender Notifications →View Corrigendums) & portal https://bhel.abcprocure.com **and not in the newspapers**. Bidders to keep themselves updated with all such information	
xiii	**Tender submission**	on portal https://bhel.abcprocure.com	

2. The offer shall be submitted as per the instructions of tender document and as detailed in this NIT. Bidders to note specifically that all pages of tender document, including these NIT pages of this particular tender together with subsequent correspondences shall be submitted by them, **Rates/Price including discounts/rebates, if any, mentioned anywhere/in any form in the techno-commercial offer other than the Price Bid, shall not be entertained.**

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

   As this tender is an E-Tender and no paper bids will be accepted therefore the scanned copy of the Demand Draft or the Cash Receipt issued by BHEL PSNR should be uploaded in the E procurement portal. Hard Copy

of the demand draft should reach BHEL PSNR HQ Noida before the due date and time of bid submission. BHEL shall not be responsible for postal or any other delays in this regard.

4. Unless specifically stated otherwise, tender must be accompanied by the prescribed amount of Earnest Money Deposit (EMD) in the manner described in Clause no. 1.9 of General Conditions of Contract.

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

However, the One Time EMD can be adjusted against the EMD applicable against this tender on specific request of bidder.

For Electronic Fund Transfer the details are as below-:

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

b) Bank Particulars

i).	Bank Name -:	STATE BANK OF INDIA
ii).	Bank Telephone No.(with STD code)-:	011-23475566
iii).	Branch Address-:	CAG II BRANCH, NEW DELHI 4th & 5th FLOOR, REDFORT CAPITAL, PARASNATH TOWERS, BHAI VEER SINGH MARG, GOLE MARKET, NEW DELHI-110001
iv).	Bank Fax No. (with STD code) -:	011-23475566
v).	Branch Code -:	17313
vi).	9 Digit MICR Code of the Bank Branch -:	110002562
vii).	Bank Account Number -:	10813608647
viii).	Bank Account Type -:	CASH CREDIT
ix).	11 Digit IFSC Code of Beneficiary Branch-:	SBIN0017313

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

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

Documents Comprising the e-Tender

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

a. Technical Tender (UN priced Tender)

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

- **i.** Tender Cost and Earnest money Deposit (EMD) furnished in accordance with NIT Clause 3.0 & 4.0.
- **ii.** Technical Bid (without indicating any prices).

b. Price Bid:

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

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

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

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

vi. In case offer is sent through hard copy/fax/telex/cable/electronically in place of e-tender, same shall not be considered.

DO NOT"S

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

Digital Signing of e-Tender

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

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The Requirement:

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

BHEL has finalized the e-procurement service Provider-:

M/s AbcProcure, Ahmedabad

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

Ellis Bridge, Ahmedabad-380006

The contact details of the service provider are given below:

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

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

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

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

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

6. **Not Used**

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

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

9. **Assessment of Capacity of Bidders:**

Bidder's capacity for executing the job under tender shall be assessed 'LOAD' wise and 'PERFORMANCE' wise as per the following:

I. **LOAD**: Load takes into consideration **ALL** the contracts of the Bidder under execution with BHEL Regions, irrespective of whether they are similar to the tendered scope or not. The cut off month for reckoning 'Load' shall be the 3rd Month preceding the month corresponding to the 'latest date of bid submission', in the following manner -

(**Note:** For example, if latest bid submission is in Jan 2017, then the 'load' shall be calculated up to and inclusive of Oct 2016)

Total number of Packages in hand = Load (P)

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

II. **PERFORMANCE**: Here 'Monthly Performance' of the bidder for all the packages (under execution/ executed during the 'Period of Assessment' in all Power Sector Regions of BHEL) **SIMILAR** to the packages covered under the tendered scope, excepting packages not commenced shall be taken into consideration. The 'Period of Assessment' shall be 6 months preceding and including the cut off month. The cut off month for reckoning 'Period of Assessment' shall be the 3rd Month preceding the month corresponding to 'latest date of bid submission', in the following manner:

(**Note**: For example, if 'latest date of bid submission' is in Jan 2017, then the 'performance' shall be assessed for a 6 months' period up to and inclusive of Oct 2016 (i.e. from May 2016 to Oct 2016), for all the unit wise identified packages (refer Table -1))

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

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

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

b) Number of Months 'T_1' for which 'Monthly Performance Evaluation' as per relevant formats, should have been done in the 'Period of Assessment' for the corresponding similar package P_1. Similarly T_2 for package P_2,T_3 for package P_3, etc. for the tendered scope. Now calculate cumulative total months '$\mathbf{T_T}$' for total similar Packages '$\mathbf{P_T}$' for all Regions (i.e. $\mathbf{T_T} = T_1 + T_2 + T_3 + T_4 + \ldots T_N$)

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

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

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

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

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

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

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

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

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

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

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

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

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

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

III. 'Assessment of Capacity of Bidder':

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

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

Note:

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

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

Note: For the transition period of 1 year (i.e. for all the NITs floated between 11th May 2019 to 10th May 2020), in addition to above, 'Assessment of Capacity of Bidder' shall also be calculated considering 'performance scores' till 36 months as per Sl. no II ii).

Higher of the results obtained out of both shall be considered for 'Assessment of Capacity of Bidder'.

IV. **Explanatory note**:

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

ii). Identified Packages (Unit wise)

Table-1

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

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

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

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

The "FIRST TIMER" tag shall remain till completion of all the contracts against which vendors has been tagged as First Timer or availability of 6 evaluation scores within last 24 months preceding and including the cut-off month in the online BHEL system for contractor performance evaluation in BHEL PS Regions.

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

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

iv). Consequent upon applying the criteria of 'Assessment of Capacity of Bidders' detailed above on all the bidders qualified against Technical and Financial Qualification criteria, if the number of qualified bidders reduces to less than four, then for further processing of the Tender, BHEL at its discretion reserves the right to also consider the bidders who are "not qualified" as per criteria of 'Assessment of Capacity of Bidders' and for this, procedure described in following three options shall be followed:

a) All the bidders having Overall Performance Rating ('R_{BHEL}') ≥60 shall be considered qualified against criteria of 'Assessment of Capacity of Bidders'.

b) If even after using option "a", the number of qualified bidders remains less than four, then in addition to bidders considered as per option "a", "First timer" bidders having average of available performance scores ≥60 upto and including the Cut Off month shall also be considered qualified against criteria of 'Assessment of Capacity of Bidders'.

c) If even after using option "a" and "b", the number of qualified bidders remains less than four, then in addition to bidders considered as per option "a" and "b", "First timer" bidders for whom no performance score is available in the system upto and including the Cut Off month, shall also be considered qualified against criteria of 'Assessment of Capacity of Bidders'.

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

v). 'Under execution' shall mean works in progress as per the following:

a. Up to execution of 90% of anticipated Contract Value in case of Civil, MM, Structural and Turbo Blower Packages

b. Up to Steam Blowing in case of Boiler/ESP/Piping Packages

c. Up to Synchronization in all Balance Packages

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

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

vii). Performance Evaluation for Activity Month shall be completed in Evaluation Month (i.e. month next to Activity Month) or in rare cases in Post Evaluation Month (i.e. month next to Evaluation Month) after approval from Competent Authority. In case scores are not acceptable, Contractor can submit Review Request to GM Site/ GM Project latest by 25th of Evaluation Month or 3 days after approval of score, whichever is later. However, acceptance/rejection of 'Review Request' solely depends on the discretion of GM Site/GM Project. After acceptance of Review Request, evaluation score shall be reviewed at site and the score after completion of review process shall be acceptable and binding on the contractor.

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

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

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

ix). Performance evaluation in CL 9 above is applicable to prime bidder and Consortium partner (or Technical tie up partner) for their respective scope of work.

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

11. For any clarification on the tender document, the bidder may seek the same over e-procurement portal as per specified format, within the scheduled date for seeking clarification, from the office of the undersigned. BHEL shall not be responsible for receipt of queries after due date of seeking clarification due to postal delay or any

other delays. Any clarification / query received after last date for seeking clarification may not be normally entertained by BHEL and no time extension will be given.

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

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

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

15. Bidders shall submit Integrity Pact Agreement (Duly signed by authorized signatory who signs in the offer), **if applicable**, along with techno-commercial bid. This pact shall be considered as a preliminary qualification for further participation. **The names and other details of Independent External Monitor (IEM) for the subject tender is as given at Clause No. 1, Salient Features of NIT, Sl. No. (xi) above.**

15a **Integrity Pact (IP)**

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

Sl. No.	IEM	Address	Email
1.	Shri Arun Chandra Verma, IPS (Retd.)	Flat No. C -1204, C Tower, Amrapali, Platinum Complex, Sector 119, Noida (U.P.)	acverma1@gmail.com
2.	Shri Virendra Bahadur Singh, IPS (Retd.)	H. No. B-5/64, Vineet Khand, Gomti Nagar, Lucknow - 226010	vbsinghips@gmail.com

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

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

Note:

No routine correspondence shall be addressed to the IEM (phone/ post/ email) regarding the clarifications, time extensions or any other administrative queries, etc on the tender issued. All such clarification/ issues shall be addressed directly to the tender issuing (procurement) department's officials whose contact details are as per **Clause No. 1, Salient Features of NIT, Sl. No. (ix) above.**

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

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

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

19. (a) BHEL reserves the right to go for Reverse Auction (RA) (Guidelines as available on www.bhel.com) instead of opening the sealed envelope price bid, submitted by the bidder. This will be decided after techno-commercial evaluation. Bidders to give their acceptance with the offer for participation in RA. Non-acceptance to participate in RA may result in non-consideration of their bids, in case BHEL decides to go for RA.

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

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

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

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

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

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

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

23. **NOT APPLICABLE.**

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

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

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

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

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

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

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

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

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

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

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

28.0 **NOT APPLICABLE.**

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

30.0 **PREFERENCE TO MAKE IN INDIA:**
For this procurement, Public Procurement *(Preference to Make in India), Order 2017 dated 15.06.2017 & 28.05.2018* and subsequent Orders issued by the respective Nodal Ministry shall be applicable even if issued after issue of this NIT but before finalization of contract/ PO/ WO against this NIT.

In the event of any Nodal Ministry prescribing higher or lower percentage of purchase preference and/ or local content in respect of this procurement, same shall be applicable.

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

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

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

32.0 Order of Precedence

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

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

for BHARAT HEAVY ELECTRICALS LTD

(SCT)

Enclosure:-

(i) Annexure-1: Pre Qualifying Requirements.
(ii) Annexure-2: Check List.
(iii) Annexure-3: Authorization of representative who will participate in the online Reverse Auction Process
(iv) Annexure-4: Feedback form
(v) Annexure-5: Integrity Pact
(vi) Other Tender documents as per this NIT.

ANNEXURE - 1

PRE QUALIFYING REQUIREMENTS

JOB	**ERECTION, TESTING, COMMISSIONING, TRIAL OPERATION, HANDING OVER AND FINAL PAINTING OF FGD & AUXILIARIES AT 1X660 MW PANKI THERMAL POWER PROJECT, PANKI, KANPUR, UTTAR PRADESH.**
TENDER NO.	**BHEL/NR/SCT/PANKI/FGD/1192**

SL. NO.	NAME AND DESCRIPTION OF PRE QUALIFICATION CRITERIA	
A	Submission of Integrity Pact duly signed	**Applicable**
B	Assessment of Capacity of bidder to execute the work as per clause 9.0 of NIT	**Applicable – by BHEL**
C **C-1**	**TECHNICAL** Bidder who wish to participate should have **'Executed'** any one of the following works during the last seven (7) years, ending on the 'latest date of bid Submission' of tender:- **C.1.1**) One Flue Gas Desulphurization (FGD) System in power plant rating of not less than 100 MW. **OR** **C.1.2**) One Boiler (E,T,C OR R&M) in single contract in power plant rating of not less than 100 MW.	**Applicable**
D **D-1**	**FINANCIAL** **TURNOVER:** Bidders must have achieved an average annual financial turnover (Audited) of **Rs. 3.54 Crores** or more over last three Financial Years (FY) i.e. (2016-2017, 2017-2018, 2018-2019). Bidder shall submit audited accounts (balance sheets and profit & loss account) in support of this. In case audited financial statements have not been submitted for all the three years as indicated above, then the applicable audited statements submitted by the bidders against the requisite three years, will be averaged for three years i.e. total divided by three. If Financial Statements are not required to be audited statutorily, then instead of audited financial statements, financial statements are required to be certified by Charted Accountant.	**Applicable**
D-2	**NET WORTH**: Net worth (only in case of companies) of the Bidder based on the latest Audited Accounts as furnished for 'D-1' above should be positive. Net Worth = Paid up share capital* + Reserves. (*: Share Capital OR Partnership Capital OR Proprietor Capital as the case may be.)	
D-3	**PROFIT:** Bidder must have earned profit in any one of the three financial years as applicable in the last three financial years as furnished in 'D-1' above. PROFIT shall be PBT earned during any one year of last three financial years as in 'D-1' above.	

D-4	Bidder must not be under Bankruptcy Code Proceedings (IBC) by NCLT or under Liquidation / BIFR, which will render him ineligible for participation in this tender, and shall submit undertaking to this effect.	
E	**Approval of Customer**	**Applicable**
F	**Consortium Criteria**	**Not Applicable**

Explanatory Notes for QR 'C'

1. Time period for achievement of the Qualification Requirements is in the last 7 years ending on the 'latest date of Bid Submission' of Tender.
2. For C-1, the word 'EXECUTED' means the bidder should have:
   a). Commissioned in respect of Flue Gas Desulphurization (FGD) system.
   b). Boiler Light Up in respect of Boiler & Auxiliaries.
3. Experience of Oil/Gas Fired Boilers shall also be considered.
4. For evaluation of PQR, the credentials of the bidder alone, and not that of the Group Company shall be considered.

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

ANNEXURE - 2

CHECK LIST

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

1	**Name of the Tenderer**	
2	**Address of the Tenderer**	
3	**Type of the Firm/ Company**	
(i)	In case of Individual Tenderer	His / her full name, address and place & nature of business shall be furnished along with the offer.
(ii)	In case of Partnership Firm	The names of all the partners and their addresses, A copy of the partnership deed/instrument of partnership dully certified by the Notary Public shall be furnished along with the offer..
(iii)	In case of Companies	a) Date and place of registration including date of commencement certificate in case of Public Companies (certified copies of Memorandum and articles of Association are also to be furnished). b) Nature of business carried on by the Company and the provisions of the Memorandum relating thereof.
4.a	**Details of Contact person for this Tender**	Name : Mr/ Ms Designation: Telephone No: Mobile No: Email ID: Fax No:
4.b	**Details of alternate Contact person for this Tender**	Name : Mr/ Ms Designation: Telephone No: Mobile No: Email ID: Fax No:
5	**EMD DETAILS**	Mode of payment: Demand Draft/ NEFT/ RTGS/ OTHER Details of Transaction:
6	**Validity of Offer**	TO BE VALID FOR **SIX MONTHS** FROM DUE DATE

	DESCRIPTION	**APPLICABILITY (BY BHEL)**	**ENCLOSED BY BIDDER**
7	Whether all pages of the Tender documents including annexures, appendices etc are read and understood	Applicable	YES / NO
8	Whether the format for compliance with **PRE QUALIFICATION CRITERIA** (ANNEXURE – 1) is understood and filled with proper supporting documents referenced in the specified format	Applicable	YES / NO
9	Audited Balance Sheet and profit & Loss Account for the last three years	Applicable	YES / NO
10	Copy of PAN Card	Applicable	YES / NO
11	Copy of GST registration	Applicable	YES / NO

SL. NO.	DESCRIPTION	APPLICABILITY (BY BHEL)	ENCLOSED BY BIDDER
12	Organization Chart of the tenderer's organization, including the names, addresses and contact information of the Directors/Partners shall be furnished along with the offer.	Applicable	YES / NO
13	Integrity Pact	Applicable	YES / NO
14	Offer forwarding letter / tender submission letter ***[Form No. F-01 (Rev 00)]***	Applicable	YES / NO
15	Declaration by Authorised Signatory ***[Form No: F-02 (Rev 00)]***	Applicable	YES / NO
16	Declaration by Authorised Signatory regarding Authenticity of submitted documents ***[Form No: F-02A (Rev 00)]***	Applicable	YES / NO
17	No Deviation Certificate ***[Form No: F-03 (Rev 00)]***	Applicable	YES / NO
18	Declaration confirming knowledge about Site Conditions ***[Form No: F-04 (Rev 00)]***	Applicable	YES / NO
19	Declaration for relation in BHEL ***[Form No: F-05 (Rev 00)]***	Applicable	YES / NO
20	Non-Disclosure Certificate ***[Form No: F-06 (Rev 00)]***	Applicable	YES / NO
21	Bank Account Details for E-Payment ***[Form No: F-07 (Rev 00)]***	Applicable	YES / NO
22	Format for seeking clarification ***[Form No: F-08 (Rev 00)]***	Applicable	YES / NO
23	Capacity Evaluation of Bidder for current Tender ***[Form No: F-09 (Rev 00)]***	Applicable	YES / NO
24	Power of Attorney for Submission of Tender/Signing Contract Agreement ***[Form No: F-25 (Rev 00)]***	Applicable	YES / NO
25	Analysis of Unit rates ***[Form No: F-26 (Rev 00)]***	Applicable	YES / NO
26	Tie Ups/Consortium Agreement are submitted as per format ***[Form No: F-22 (Rev 00)]***	Not Applicable	YES / NO

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

DATE :

AUTHORISED SIGNATORY
(With Name, Designation and Company seal)

ANNEXURE - 3

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

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

ANNEXURE – 4

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

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

BHEL-IP

INTEGRITY PACT

Between

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

and

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

Preamble

The Principal intends to award, under laid-down organizational procedures, contract/s for _____

_____

_____ . The Principal values full compliance with all relevant laws of the land, rules and regulations, and the principles of economic use of resources, and of fairness and transparency in its relations with its Bidder(s)/ Contractor(s).

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

Section 1- Commitments of the Principal

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Section 4 - Compensation for Damages

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

4.2 If the Principal has terminated the contract according to Section 3, or if the Principal is entitled to terminate the contract according to section 3, the Principal shall be entitled to

demand and recover from the Contractor liquidated damages equivalent to 5% of the contract value or the amount equivalent to Security Deposit/ Performance Bank Guarantee, whichever is higher.

Section 5 - Previous Transgression

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

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

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

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

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

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

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

Section 8 - Independent External Monitor(s)

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

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

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

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

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

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

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

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

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

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

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

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

Section 9 - Pact Duration

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

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

Section 10 - Other Provisions

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

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

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

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

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

For & On behalf of the Principal

(Office Seal)

For & On behalf of the Bidder/ Contractor

(Office Seal)

Place----------

Date----------

Witness:_____

(Name & Address) _____

_____

Witness:_____

(Name & Address) _____

_____

वी. के. गुप्ता/V. K. GUPTA
अपर महाप्रबंधक (उप संविदा एवं क्रय)
Addl.General Manager (SCP)
भारत हेवी इलेक्ट्रिकल्स लिमिटेड, पावर सेक्टर-उत्तरी क्षेत्र
Bharat Heavy Electricals Ltd., Power Sector-Northern Region
प्लॉट सं.25, सेक्टर-16ए, नोएडा/Plot No.25, Sec.16A, Noida

TECHINICAL CONDITIONS OF CONTRACT

OF

ERECTION, TESTING, COMMISSIONING, TRIAL OPERATION, HANDING OVER AND FINAL PAINTING OF FGD & AUXILIARIES

FOR

1X660 MW PANKI THERMAL POWER PROJECT, PANKI, KANPUR, U.P.

Bharat Heavy Electricals Limited
(A Govt. Of India Undertaking)
Power Sector – Northren Region,
Plot No. 25 , Sector - 16A,
Distt. Gautam Buddh Nagar,
NOIDA – 201 301 (INDIA)

TECHNICAL CONDITIONS OF CONTRACT (TCC)
INDEX

Sl. No.	Title	Description
1	Owner	**UTTAR PRADESH RAJYA VIDYUT UTPADAN NIGAM LIMITED (UPRVUNL), LUCKNOW**
2	Project Title	Panki Thermal Power Station (1X660 MW)
3	Project Site Location	Panki, Kanpur, U.P., India
4	Nearest Railway Station	Panki (5 Km.)
5	Nearest Airport	Kanpur (25 Km.), Lucknow (80 Km.)
6	Extreme Recorded DBT	Maximum (47.3^{o}C) , Minimum (-0.9^{o}C)
7	Average Relative Humidity	Annual Average (65%)
8	Rainfall	Annual Average (832.6 mm)
9	Nearest Water Body	Lower Ganga Canal (adjacent to site)
10	Basic Wind Speed	47.0 m/s (As per IS: 875 Part-III)
11	Seismic Data	Zone-III (As per IS: 1893)

THE SCOPE OF THE WORK WILL COMPRISE OF BUT NOT LIMITED TO THE FOLLOWING
(All the works mentioned hereunder shall be carried out within the accepted rate unless otherwise specified.)

2.0 **SCOPE OF WORK**

2.1 BHEL has been awarded the work of Design, Engineering, Supply, Erection, Testing & Commissioning of 1X660 MW Panki Thermal Power Station Extension at Panki, Kanpur, U.P. by **UTTAR PRADESH RAJYA VIDYUT UTPADAN NIGAM LIMITED (UPRVUNL)**.

2.2 Scope of work under this tender specification consists of **ERECTION, TESTING, COMMISSIONING, TRIAL OPERATION, HANDING OVER AND FINAL PAINTING OF FGD & AUXILIARIES.**

2.3 **The scope of the work under these specifications broadly consists of but not limited to following:**

1. Receipt of materials from site store/yard, storage, preservation, erection and commissioning of the system.
2. Their preservation and, safe keeping, watch and ward
3. Checking, Dressing, Chipping, Leveling of foundations
4. Pre-assembly, Erection, Alignment of structures, etc.
5. Welding, Heat Treatment, Radiography, UT and Non-Destructive Tests, as per approved documents / FQP.
6. Air Leak test, and other pre commissioning tests,
7. Insulation, Touch up and finish painting include supply of paints, etc.
8. Assistance during PG test as per scope given in the tender
9. Unit Trial Operation, resolving any deficiencies observed and Handing over of FGD & Auxiliaries at **1x 660MW Panki TPS, Panki, Kanpur, UP.**

2.4 The work to be carried out at quoted / accepted rates by the Contractor under the scope of these specifications covers the complete work of handling, loading and transporting of materials from project stores sheds / storage yards to site of erection or preassembly yard and unloading at pre-assembly area/erection site, checking, cleaning chipping and levelling of foundations, providing packers and shims/pre-assembling of equipments at the preassembly yard, inspection, minor rectification, preservation, erection, levelling, and other adjustments, cutting, edge / surface preparation, welding, grinding,

radiography, LPI/ MPI/ UT testing wherever needed, heat treatment, carrying out air tightness test by soap solution / kerosene, hydraulic test, steam / air blowing, including inter connection of all the termination points, erection and dismantling of all temporary piping, valves, pumps, tanks etc., required for the above operations, all pre-commissioning tests and trial runs of the FGD & Aux including supply and application of Final Painting for **1X660MW Panki TPS, at Panki, Kanpur, U.P**.

2.5 Supply of Bed materials such as Beam, Channel, Angles & flats for Pre-Fabrication shall be under the scope of the contractor without any extra cost to BHEL.

2.6 The quantities indicated in the tender specification are approximate and are liable for variation and alteration at the discretion of BHEL. The quoted unit rate shall be applicable for any additional product group also, if included at a later date integral to the main scope of work / package envisaged. The work executed shall be measured and priced as per the unit rate arrived at for each work area as mentioned in the relevant clauses.

2.7 **PG wise break up of FGD & Auxiliaries is tentative as indicated under Annexure-A**

Regarding the tonnage indicated, the decision of the BHEL Engineer with respect to scope, and keeping the work suitability, quality and time schedule will be final and binding on the contractor. However, the work under this tender shall be broadly as per following:

2.7.1 **Tentative weight to be erected for the FGD & Aux. shall be indicated in Annexure-A. Accordingly, approximate weight to be erected shall be 5,587 MT.**

Contractor is required to erect actual tonnage (irrespective of any variation plus or minus) which may be necessary to complete their work and commissioning the above systems and complete the work in all respects as detailed in tender specifications, for which payments shall be released on finally accepted tonnage rates. Contractor undertakes to erect/ commission actual quantities as per advice of BHEL Engineer and accordingly the final contract price shall be worked out on the basis of quantities actually erected at site and payments will also be regulated for the same.

Customer, M/s UPRUVNL and / or their Consultant may depute their representative for checking and supervision of important stages of work. The contractor shall be required to provide all facilities for inspection of works, without any cost implications to the BHEL.

Any defect in quality of work or deviations from drawings/ specifications pointed out during such inspection shall be made good by the contractor in the same way as if pointed out by the BHEL Engineer, without any cost implication to BHEL.

2.8 Supervisors / Engineers, consumables etc., required for the scope of work shall be provided by the contractor. All the expenditure including taxes and incidentals in this connection will have to be borne by him unless otherwise specified in the relevant clause. The contractor's quoted rates should be inclusive of all such contingencies.

2.9 It shall be specially noted that the contractor's labour and staff may have to work round the clock to meet the completion schedules / plans, which may involve payment of considerable overtime. The contractor's quoted rates should be inclusive of all such contingencies.

2.10 The terminal points can be inferred from the relevant drawings and any further clarifications can be obtained / decided by BHEL and that is final and binding on the contractor for deciding the scope of work and effecting the payment for the work done up to the terminals. Carrying out work as per the specification between equipments constituting terminal points, whether the terminal equipments fall within the scope of work/specification, contractor shall carry out the terminal joints at either end. Also where the piping connection to the terminal points involve flanged joints, matching of flanges, fixing gaskets, bolting and tightening as per BHEL Engineers instructions is in the scope of work. In case piping connected to equipment, matching of flanges for achieving the parallelism and alignment at the equipment end, by suitably resorting to heat correction or other method as instructed by BHEL Engineer, with in the quoted rate.

2.11 The work shall conform to dimensions and tolerances given in various drawings and quality manuals provided by BHEL. If any portion of work is found to be defective in workmanship not conforming to drawings or other stipulations, the contractor shall dismantle and redo the work duly replacing the defective materials at his cost, failing which the job will be carried out by BHEL by engaging other agencies / departmentally and recoveries will be effected from contractor's bill towards expenditure incurred including BHEL's overhead charges.

2.12 Contractor has to work in close co-ordination with other erection agency at site. BHEL engineer will co-ordinate area clearance. In a project of such magnitude, it is possible that the area clearance may be less/more at a particular given time. Activities and erection

program have to be planned in such a way that the milestone events like boiler light up, steam blowing, SV Floating, Trial Operation etc., are achieved as per schedule/ plans. Contractor shall arrange & augment the resources accordingly.

2.13 No member of the already erected structure/ platform, pipes, grills, platform, other component and auxiliaries should be cut without specific approval of BHEL engineer.

2.14 The storage yard is located within the plant boundary. ODC consignments will be unloaded near to erection site as per the space availability. Some other materials may also be unloaded near to erection site as per space availability. All other materials have to be transported from storage yard to construction area by the contractor at his own cost.

2.15 **SITE VISIT**

Contractor should visit site and acquire full knowledge & information about site conditions and in & around the plant premises, together with all statutory, obligatory, mandatory requirements of various authorities before submission of bid. Post Award of work NO claim shall be admissible in this regard.

2.16 **SITE ORGANISATION**

2.16.1 Contractor shall provide adequate staff in the following areas in addition to the staffing requirements of execution as instructed/informed by BHEL:

1. Overall planning, monitoring & control.
2. Quality control and quality assurance.
3. Materials management.
4. Safety, fire & security.
5. Industrial relations and fulfilment of labour laws and other statutory obligations.

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

2.16.3 On award of contract, the contractor shall submit to BHEL its site organization chart indicating the various levels of experts to be deployed on the job. BHEL reserves the right to reject or approve the list of personnel proposed by the Contractor. The persons, whose bio-data have been approved by BHEL, will have to be posted at site and deviations in this regard will not generally be permitted.

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

2.16.5 Organization chart for site should indicate the various levels of experts to be posted for supervision in the various fields in erection, commissioning etc as applicable. For proper supervision of the work, the contractor shall ensure providing one qualified supervisor against deployment of every 15 workmen.

2.17 ERECTION SCHEDULE

2.17.1 Within 15 days of LOI date Contractor shall submit detailed program (L2 schedule) of construction / erection / commissioning, along with matching resources, T&P deployment and manpower deployment schedule for approval to BHEL Site In-Charge/Project manager-Noida. L2 schedule shall be the working level document demonstrating contractor's ability and methods of completing the work within the key milestones identified in the tender specification. This program shall be further detailed showing start of erection and subsequent activities and shall form the basis for site execution and detailed monitoring. The three monthly rolling program with the first month's program being tentative based on the site conditions would be prepared based on these program. The Contractor shall also be involved along with the Customer/BHEL to tie up detailed resource mobilization plan over the period of time of the contract matching with the performance targets.

2.17.2 Program shall be jointly finalized by the site in-charge of the contractor with BHEL/Customer's project coordinator as well as the site planning representative. The erection program will also identify the sequential erectable tonnages.

2.18 **Important information for the Erection Work of FGD system under this tender specifications:**

2.18.1 Absorber System W/D (wet dry) interface having lining of C276 material. Site welding of liner is in the contractor scope. BHEL shall supply the liner with plug welding and special electrode for the welding of liner shall be supplied by BHEL Ranipet. Welding to be done as per approved procedure of BHEL/UPRVUNL.

2.18.2 Rubber lined pipes shall be supplied by BHEL.

2.18.3 Tanks shall be supplied by the units in more than one segment (rolled sections) having height of each segment approx. 2500 mm. Contractor have to complete the assembly at site with necessary welding/NDT/testing as per the approved FQP**. Rubber lining of the tanks (along with surface preparation by blasting or any other approved method and necessary testing i.e spark test/ pin hole test of the rubber lining) excluded from the scope of work and shall be done by rubber lining vendor of BHEL Ranipet.** However necessary assistance to be provided by the contractor.

2.18.4 Lime stone silos shall be supplied by the units in more than one segment (3 to 4 segment) and height of each segment shall be 2500 mm. Contractor shall have to complete the assembly, final welding, /NDT/testing as per the approved drawings/ documents/ FQP.

2.18.5 Erection and commissioning of the below mentioned equipments/system under FGD system **excluded** from the scope of work under this contract. Erection and commissioning shall be done by the BHEL Ranipet vendor /system supplier/OEM of the system.
a. Absorber Elevator
b. Rubber lining of tanks and absorber.

2.18.6 BHEL shall provide the technical support for commissioning of below mentioned equipments on need basis.

a. Slurry Recirculation Pump System
b. Mist Eliminator & Accessories
c. Air Oxidation System
d. Slurry Pumps & Accessories
e. Agitators
f. Limestone Mill
g. Primary Hydrocyclone And Accessories
h. Secondary Hydrocyclone And Accessories
i. Gypsum Belt Filter And Accessories

Note:

Quantities and dimensions mentioned above for tanks, silos, absorber are indicative and to give general idea regarding the extent of work for estimation purpose. Quantity and dimension detail based on the engineering /drawings documents available as on date of NIT and liable for variation.

2.19 DEWATERING

2.19.1 Contractor shall ensure at all times that his work area & approach/access roads are free from accumulation of water, so that the materials are safe and the erection/progress schedule are not affected. No separate claim in this regard shall be admitted by BHEL. No separate payments for dewatering of subsoil, surface water or catchment water, if required, at any time during execution of the work including monsoon period shall be considered by BHEL.

2.19.2 Contractor shall make necessary arrangements to ensure that the atmosphere in working area (under the scope of work in this tender) and on roads is free from particulate matter like dust, sand etc. by keeping the top surface wet for ease in breathing. Provision of required tanker with spraying arrangement has to be ensured by contractor within the quoted rates, at no extra cost to BHEL.

2.20 The contractor shall comply with following towards Social Accountability;

a) The contractor shall not employ any employee less than 15 years of age in pursuant to ILO convention. If any child labour were found to have been engaged, the Contractor shall be levied with expenses of bearing his education expenditure which will include stipend to substantiate appropriate education or employ any other member of family enabling to bear the child education expenditure.
b) The contractor shall not engage Forced/ Bonded Labour and shall abide by abolition of Bonded Labour System (Abolition) Act, 1976.
c) The contractor shall maintain Health & safety requirement as stipulated in the Contract and Contract Labour (Regulation & Abolition) Act, 1970.
d) The Contractor shall abide by UN convention w.r.t. Human Rights and shall be liable for Discrimination/ Corporal punishment for failure in meeting with relevant requirements.

e) The Contractor shall abide the requirement of Contract Labour (Regulation & Abolition) Act, 1970 for working hours.
f) The Contractor shall abide by the Statutory requirement of Minimum Wages Act 1948, payment of Wages Act 1936.
g) The Contractor shall arrange potable drinking water to its employees & workers.

2.21 Contractor shall ensure daily housekeeping and keep proper cleanliness of work place and do the disposal of wastes to certified area.

2.22 BHEL shall recover the amount of compensation paid to victim(s) by BHEL towards loss of life/ permanent disability due to an accident which is attributable to the negligence of the contractor, agency or firm or any of its employees as detailed below:

a) **Victim:** Any person who suffers permanent disablement or dies in accident as defines below.
b) **Accident:** Any death or permanent disability resulting solely and directly from any unintended and unforeseen injurious occurrence caused during the manufacturing/ operation and works incidental thereto at BHEL factories/ offices and precincts maintenance, trouble shooting, servicing, overhaul, renovation and retrofitting, trial operation, performance guarantee testing undertaken by the company or during any works/ during working at BHEL Units/ Offices/ townships and premises/ Project sites.
c) **Compensation** in respect of each of the victims:
    I. In the event of **death or permanent disability** resulting from **Loss of both limbs**: Rs 10,00,000/- (Rs Ten Lakhs)
    II. In the event of **other permanent disability**: Rs 7,00,000/- (Rs Seven Lakhs)

d) **Permanent Disablement:** A disablement that is classified as a permanent total disablement under the provision to Section 2(l) of the Employee's Compensation Act. 1923.

2.23 **Painting (Applicable in entire scope of work):** All FGD & Aux structures/ components shall be supplied from BHEL units/ workshops with finish coats of paint. Painting (wherever required), incidental to the work, shall be in the scope of the contactor, including supply of the required paints and primers and associated consumables.

Any shop painted structure/component is required to be repainted due to the various reasons such as Mishandling, damage during erection process, other reasons incidental

to the work etc, such re-painting/finish painting of the components/structures shall be in the scope of the contractor including the supply of paints and primers along with all required consumables.

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

3.0 FACILITIES IN THE SCOPE OF BHEL/ CONTRACTOR

S.No.	Description	Scope		Remarks
		BHEL	Contractor	
	PART-I			
1.1	**ESTABLISHMENT**			
1.1.1	**FOR CONSTRUCTION PURPOSE**			
A.	Open space for office	**YES**		Limited space (Free of charge). As and where made available by customer M/s UPRVUNL /BHEL
B.	Open space for storage	**YES**		Limited space (Free of charge). As and where made available by customer M/s UPRVUNL/BHEL
1.1.2	**FOR LABOUR COLONY**			
A.	Open space		**YES**	To be arranged by Contractor outside plant premises.
1.2	**ELECTRICITY**			
1.2.1.	Electricity for construction purposes			**Chargeable**. As per UPRVUNL/ UPPCL standard rates Contractor shall install calibrated energy meter for metering electricity consumption.
1.2.1.1	Single point source	**YES**		
1.2.1.2	Further distribution for the work to be done which include supply of materials & execution		**YES**	

S.No.	Description	Scope		Remarks
		BHEL	Contractor	
1.2.2	**Electricity for the office, stores, canteen etc of the bidder which include:**			
1.2.2.1	Distribution from single point including supply of materials & service		**YES**	
1.2.2.2	Supply, Installation & connection of material of energy meter including operation & maintenance		**YES**	
1.2.2.3	Charges, Duties & deposits including statutory clearances for above		**YES**	
1.2.2.4	Demobilization of the facilities after completion of works		**YES**	
1.2.2.5	Electricity for living accommodation of the bidder's Staff, engineers, supervisors etc. on the above lines	**NA**	**YES**	**No Accommodation inside premises.**
1.3	**WATER SUPPLY**			
1.3.1	**FOR CONSTRUCTION**			
1.3.1.1	Making the water available at single point	**YES**		Shall be provided at single point source as per availability. **However, Bidder has to ensure an alternative arrangement for construction water at his own cost by resorting to the methods like bore well, water tankers, etc**.
1.3.1.2	Further distribution as per the requirement of work including supply of materials & execution		**YES**	
1.3.2	**Water supply for bidder's office, stores, canteen etc**			
1.3.2.1	Making the water available at single point		**YES**	

S.No.	Description	Scope		Remarks
		BHEL	Contractor	
1.3.2.2	Further distribution as per the requirement of work including supply of materials & execution		YES	
1.4	**LIGHTING**			
1.4.1	For Construction work (supply of all materials) 1. At office storage area 2. At Yard or any other places where material is unloaded/stored 3. At the construction site /area		YES	
1.4.2	For Construction work (Execution of lighting work/arrangements) 1. At office storage area 2. At Yard or any other places where material is unloaded/stored 3. At the construction site /area		YES	
1.4.3	Providing the necessary consumables like bulbs, tubelights, Switches, etc. for maintaining the lighting system		YES	
1.5	**Communications facilities for site operations of the bidder**			
1.5.1	Telephone, fax, internet, intranet, email etc.		YES	
1.6	**COMPRESSED AIR SUPPLY**			
1.6.1	Supply of compressor and all other equipment is required for compressor & compressed air system including pipes, valves, storage system, etc		YES	
1.6.2	Installation of above system and operation & maintenance of the same		YES	

S.No.	Description	Scope		Remarks
		BHEL	Contractor	
1.6.3	Supply of all consumables for the above system during the contract period.		YES	
1.7	**TRANSPORTATION**			
1.7.1	For site personnel of the bidder		YES	
1.7.2	For bidder's equipments and consumables (T&P, Consumables etc)		YES	

S.No.	Description	Scope		Remarks
		BHEL	Contractor	
2.	**ERECTION FACILITIES**			
2.1	Providing the erection drawings for all equipments covered under this scope	YES		
2.2	Drawings for construction methods	YES	YES	In consultation with BHEL
2.3	As-built drawings – wherever deviations observed and executed and also based on the decisions taken at site- example – routing of small bore pipes		YES	In consultation with BHEL
2.4	Shipping lists etc for reference and planning the activities	YES		Planning activity in consultation with BHEL
2.5	Preparation of site erection schedules and other input requirements		YES	In consultation with BHEL
2.6	Review of performance and revision of site erection schedules in order to achieve the end dates and other commitments	YES	YES	In consultation with BHEL
2.7	Weekly erection schedules based on Sl No 2.5		YES	In consultation with BHEL

S.No.	Description	Scope		Remarks
		BHEL	Contractor	
2.8	Daily erection / work plan based on Sl No 2.7		**YES**	For daily monitoring meeting at site
2.9	Periodic visit of the senior official of the bidder to site to review the progress so that works are completed as per schedule.		**YES**	
2.10	Preparation of preassembly bay		**YES**	
2.11	Arranging the materials required for preassembly		**YES**	

3.1 **OPEN SPACE**:

3.1.1 Minimum Open space as made available by customer will be provided at free of charges to the contractor, for construction of temporary office shed, contractor's stores shed(s).

3.1.2 BHEL shall not provide to the contractor any residential accommodation to any of his staff and the contractor has to make his own arrangements. Contractor has to make his own arrangements for labour colony outside plant premises.

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

3.2 **ELECTRICITY**

3.2.1 The construction power (415V) will be provided at a single point for construction. Construction power shall be provided from the nearest Substation / tapping point which may be away from the erection site. For the purpose of measurement of power consumed, the contractor shall provide Energy meter with valid calibration certificate. Distribution from this source for different locations is to be arranged by the bidder at his cost.

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

3.4 BHEL will not be responsible for any loss or damage to the contractor's equipment as a result of variation in voltage or frequency or interruptions in power supply.

3.5 The Contractor shall be responsible for providing all necessary facilities like residential accommodation, transport, electricity, water, medical facilities etc. at his own cost as required under various labour laws and statutory rules and regulations framed there under to the personnel employed by him.

3.6 Provision of distribution lines of electrical power from the central points to the required place with proper distribution boards observing the safety rules laid down by the electrical authorities of the state shall be done by the contractor, supplying all the materials like cables, distribution board, switch boards, TPN, CBS, ELCBS/ MCCBS/ Copper / Brass clamps, copper conductor, change over switches pipes etc. at his own cost. If any failure is caused in supply of the power and water, it is the responsibility of the contractor to make alternate arrangements at his cost. The contractor shall adjust his working shifts / hours accordingly and deploy additional manpower if necessary so as to achieve the targets. **The energy meter as required to be installed by the contractor & shall be tested and certified by State Electricity Board or any other agency approved by the customer at his cost.**

3.7 The contractor while drawing construction power supply from Distribution Board should strictly adhere to following points.

a) All electrical installations should be as per Indian Electricity rules.
b) All distribution Boards installed by the contractor should be constructed with fireproof materials viz. Steel frames, Bakelite sheets etc.
c) Connection for single phase should be taken from phase and neutral. Nowhere the connection should be taken with earth as neutral.
d) All electrical connections should be made through connectors, nuts and bolts, switches, plug and sockets. Loose connections or hooking up of wires shall not be permitted.
e) Contractors have to make their own earthing arrangement for their equipment / DB earthing.
f) All electrical equipment / tools and plants should be properly earthed. DBs to be earthed diagonally opposite at two points.
g) Contractor should use “MCCB” and “ELCB” either on incoming or outgoing connections to the DBs.
h) Contractor should ensure that all the CBs / TPNs/ Fuses/ MCCB / ELCB cables etc. should be of adequate rating/ capacity.
i) For permission of supply connections contractor has to submit a test report of their installations with a single line diagram of connected/ proposed loads.

3.8 ELCB will be tested once in a week or as directed by BHEL by actually simulating the earth leakage for all installations and the same shall be recorded in the logbook to be maintained by the contractor.

3.9 In case of power cuts / load shedding no compensation for idle labour or extension of time for completion of work will be given to contractor.

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

3.11 **DRINKING WATER -** Bidder shall provide drinking water at the work spot at their own cost.

3.12 On completion of work or as and when required by BHEL, all the temporary buildings, structures, pipe lines, cables etc. shall be dismantled and levelled and debris shall be removed, as per instructions of BHEL, by the contractor at his cost. In the event of his failure to do so, the Engineer will get it done and expenses incurred shall be recovered from the contractor along with prevailing overheads. The decision of BHEL Engineer in this regard shall be final.

3.13 Compressor of required capacity for construction purposes shall be arranged by Contractor.

3.14 **OTHER FACILITIES:** Adequate water-less urinals, at least 2 nos, and toilets, at least 2 Nos., shall be arranged by the contractor within quoted rates, at site of construction with proper disposal arrangement.

4.0 T&Ps AND MMEs DEPLOYED BY CONTRACTOR

S.NO.	EQUIPMENT	CAPACITY	QTY. IN NOs
1.	Tyre Mounted Mobile Crane with Telescopic Boom	40 MT	1
2.	Tyre Mounted mobile Crane/ Hydra	12/ 14/ 18 MT	APR
3.	Trailer with Pulling Unit	20 MT	APR
4.	Drilling Machines		APR
5.	Grinding Machines		APR
6.	Submerged Arc welding Machine		APR
7.	Oxy- acetylene Gas Cutting Set		APR
8.	Plasma Cutting Machine		APR
9.	Hoisting & Pulling Devices/ Pulleys etc		APR
10.	Electric Winch	2/5/10MT	APR
11.	Welding sets with accessories and ovens for welding electrodes backing and holding		APR
12.	**Radiography arrangement including source**		
	Iridium 192		APR
13.	Chain Pulley blocks of various & suitable capacities		APR
14.	Three phase DB with complete set up for drawl and distribution of construction power		APR

S.NO.	EQUIPMENT	CAPACITY	QTY. IN NOs
15.	Electrical cables for drawl and distribution of construction power, heating machines		APR
16.	Sleepers of suitable sizes		APR
17.	Concrete block for pre-assembly bed		APR
18.	Various sizes of clamps/ fixtures for assembling		APR
19.	Dewatering pumps		APR
20.	Magnetic particle testing equipment DRY & WET Type		APR
21.	DPT Kit		APR
22.	Elcometer for paint thickness checking		APR
23.	Hand Operated Megger 500/1000V		APR
24.	Tong Tester 10,20 or 50 Amp +/-3% accuracy		APR
25.	Digital Analogue Multi meter		APR
26.	U Tube manometer 0-2000mm Water Column		APR
27.	Inclined Manometer 0-50mm Water column		APR
28.	Calibrated Electrically operated torque Wrench		APR
29.	Bolt Tension Calibrator		APR
30.	Scaffolding Pipes		Min. 1000 Nos/ APR
31.	Micrometre (inside and Outside)		APR
32.	Dial Gauge		APR

Note: APR- As per requirement (Contractor shall have to deploy the T&P whenever required at site as decided by BHEL ENGINEER)

4.1 The above list specifies only major T&Ps (tentative, may not be complete) to be deployed by the contractor and is based on minimum requirement. All additional / other tools and plants including suitable capacity D shackles, slings, rails, sleepers, hydraulic / mechanical jacks etc which are required for satisfactory & timely completion of work shall also be deployed by the contractor within finally accepted rate / price.

4.2 **The above list is only indicative and these T&Ps may not be required for entire contract period but contractor shall ensure the availability of the T&Ps as per work requirement and T&P Deployment schedule.**

T&P Deployment schedule shall be finalized at site in consultation with BHEL Engineer, prior to commencement of work, based on the work fronts/work requirement. Deployment may be revised time to time depending upon work requirement. BHEL decision shall be final and binding regarding the T&P deployment schedule. Contractor shall mobilize / maintain the T&P's as per the deployment schedule notified time to time by BHEL Engineer.

4.3 If any one of T&P mentioned above is not needed for proper execution of scope of work, provided contractor has not utilized BHEL free issued T&P for completing such work, no recovery from contractor shall be applicable.

4.4 Any additional item required in addition to above mentioned T&P for proper execution of scope of work, contractor has to arrange such T&P within quoted rate on the instruction of BHEL within two weeks.

4.5 **In case the contractor does not deploy or delays deployment or deploys for a shorter period of major T&P with reference to schedule specified or T&P deployed is out of service/non-available for continuous more than 5 days or cumulative downtime/ non-availability of 10 days in a month, BHEL will recover non-refundable penalty per day in the following manner:**

a) 40 MT crane- @ Rs 5000/- per day
b) 12/ 14/ 18 MT hydra crane - @ Rs 3000/- per day
c) 20 MT Trailer - @ Rs 2000/- per day

For the daily recovery rate for other T&P/IMTEs BHEL Engineer decision shall be final and binding on the contractor.

4.6 In addition to the deduction mentioned in clause 4.5 above, if work gets delayed due to non-availability of any T & P, BHEL reserves the right to get the work done at the risk and cost of contractor.

4.7 In case BHEL had to deploy its own T&P, hire charges of T&P applicable for outside agencies as per extant guidelines for "Hire Charges on issue of Capital Tools & Plants" shall be recovered.

In case BHEL had to deploy the T&P from outside agency, actual hiring cost plus applicable overheads shall be recovered.

4.8 All the tools and tackles/measuring instruments shall be duly tested/calibrated and valid certificate to that effect should be submitted to BHEL site in-charge before the start of work.

4.9 **If the work related to T & Ps mentioned above is completed then, BHEL can release that T & P during contract period / extended period if any**. However, written permission shall be taken by contractor from BHEL construction Manager for releasing the T&P.

5.0 T&Ps AND IMTEs DEPLOYED BY BHEL ON SHARING BASIS

LIST OF T&P BEING PROVIDED BY BHEL ON FREE OF HIRE CHARGES AND ON SHARING BASIS				
Sl. No.	**Equipment**	**Capacity**	**Qty.**	**Remark**
1	**CRAWLER CRANE**	135 MT	1 No.	On sharing basis
2	**CRAWLER CRANE**	250 MT/270 MT	1 No.	On sharing basis
3	**AIR BLOWER**	Suitable Capacity	1 No.	On sharing basis

NOTES:

1. **Cl.4.2.2.16 c) of SCC** shall be read as:-
   a. **For BHEL's cranes 75 MT & above:-** Day-today upkeep and running maintenance like filling topping up of lubricants, changing filters, etc. including repair of self-starter, batteries and dynamo of these cranes shall be excluded from the scope of the contractor.
   b. **For BHEL's cranes below 75 MT capacity:-** Day-today upkeep and running maintenance like filling topping up of lubricants, changing filters, etc. including repair of self-starter, batteries and dynamo of these cranes shall be responsibility of the contractor. If on checking it is found that tge same is not followed, BHEL shall exercise its right to get the job/works done at the risk and cost of the contractor.
   c. **Common for above Sl. No. (a) & (b):-** In case of breakdown of crane, contractor shall provide the necessary manpower for maintenance of the BHEL owned crane to maintenance agency (deployed by BHEL), failing to do so BHEL will get the job done at the risk and cost of contractor. BHEL may also provide cranes through crane hiring agencies in which case the day-to-day upkeep and running maintenance shall also be excluded from scope of contractor. The contractor shall arrange fuel for the operation of hired & BHEL owned cranes also.

2. **Cl.4.2.2.16 e.) of SCC**. shall be read as:-
   a. **For BHEL's cranes 75 MT & above:-** The operator, helper & maintenance personal (Engineer/Technician/OEM) for BHEL's cranes 75 MT & above capacity being provided by BHEL free of cost. Further fuel for operation of all BHEL cranes shall be provided by contractor without any extra cost.
   b. **For BHEL's cranes below 75 MT capacity:-** The operators for BHEL's cranes 75 MT below capacity shall be provided by the contractor free of cost. These operators should possess valid license for heavy vehicle. Further fuel for

operation of all BHEL cranes shall be provided by contractor without any extra cost.

3. The Crane at Sl No. 1 will be provided as per requirement and availability at the sole discretion of the BHEL Engineer.

4. Crane(s) for erection of materials beyond the capacity of above mentioned cranes shall be provided by BHEL free of hire charges on sharing basis.

5. The spares of Huck Bolting Machines i.e. anvils, carbon brushes, nose assembly, jaw sets, trigger switch & service kit for installation tools will **be in contractor's scope.**

6. The contractor shall make necessary arrangement like lying of special sleeper beds, assembly & dismantling of heavy lift attachment, boom, jib etc. for movement and operation of crane.

7. Cranes are only for erection purpose and shall not be available for material transportation purpose. Contractor shall make their own arrangements for material transportation to erection site.

8. Other T&P than mentioned above, contractor shall transport from BHEL stores, install, operate, carry out maintenance, dismantle after use and return to BHEL stores or as specified by BHEL.

9. In case of non-availability of these equipment's, due to any reason i.e., unavoidable breakdown, major overhaul or any other reason etc., the contractor should make arrangement at his own cost to meet the erection targets. No extra claim will be admitted due to non-availability of any of the above equipment. No delay in execution of work shall be accepted on this account.

Cranes provided by BHEL will be on sharing basis with other agencies / contractors of BHEL. The allocation of cranes shall be the discretion of BHEL engineer, which shall be binding on the contractor. Cranes will be deployed at appropriate time as decided by BHEL for suitable duration and intended purpose. Augmentation of BHEL T & P under special circumstances shall be discretion of BHEL

6.0 TIME SCHEDULE

6.1 INITIAL MOBILIZATION

After receipt of LOI, contractor shall discuss with Project Manager / Construction manager regarding initial mobilization. Contractor shall mobilize necessary resources within **15 days of issue of LETTER OF INTENT** or as per the directive of BHEL. Such resources shall be progressively augmented to match the schedule of milestones and commissioning. **However, BHEL Engineer will certify the actual date of start of work after adequate mobilization of manpower, major equipment and other T&P by the contractor.**

6.2 AUGMENTATION OF MOBILISATION

Contractor shall subsequently augment his resources in such a manner that daily erection activities shall be completed on daily basis and the entire work is completed within the time schedule/contract period. Mobilization of contractor's resources shall be made and augmented from time to time in such a manner that the work in scope is carried out in an uninterrupted manner.

6.3 CONTRACT PERIOD

Entire work as detailed in the tender specifications shall be completed within **19 (Nineteen) months** from the Zero date as per program / milestones indicated by BHEL Engineer. Contractor has to mobilize adequate resources to meet BHEL‟s commitments to their customer as indicated from time to time.

6.4 Entire work under this specifications shall be carried out in accordance with the broad schedule as furnished below, within the stipulated completion period. This schedule will undergo review and based on progress vis-à-vis project requirement, contractor shall submit revised schedule for approval of BHEL/Customer M/s UPRVUNL:

MILESTONES	MONTH	REMARKS
Start of Erection	ZERO/1st month	
Air Tightness Test of complete ducting	10th month	M1
Boiler Light up	10th month	
Commissioning of FGD	13th month	M2
Synchronization (Coal)	13th month	
Full load	14th month	
Trial/Initial Operation	17th month	
Completion of facilities	19th month	

Provision of Penalty in case of slippage of Intermediate Milestones:

M1 & M2 are the intermediate LD milestone. Milestones LD shall be applicable if the delay in achieving the milestone solely attributable to the contractor.

1. In case of slippage of these identified Intermediate Milestones, Delay Analysis shall be carried out on achievement of each of these two Intermediate Milestones
2. In case delay in achieving M1 Milestone is solely attributable to the contractor, 0.5% per week of executable contract value*, limited to maximum 2% of executable contract value, will be withheld.
3. In case delay in achieving M2 Milestone is solely attributable to the contractor, 0.5% per week of executable contract value*, limited to maximum 3% of executable contract value , will be withheld.
4. Amount already withheld, if any against slippage of M1 milestone, shall be released only if there is no delay attributable to contractor in achievement of M2 Milestone.
5. Amount required to be withheld on account of slippage of identified intermediate milestone(s) shall be withheld out of respective milestone payment (corresponding RA Bill) and balance amount (if any) shall be withheld @10% of RA Bill amount from subsequent RA bills.
6. Final deduction towards LD (if applicable), on account of delay attributable to contractor shall be based on final delay analysis on completion/ closure of contract. Withheld amount, if any due to slippage of identified intermediate milestone(s) shall be adjusted against LD or released as the case may be.
7. In case of termination of contract due to any reason attributable to contractor before completion of work, the amount already withheld against slippage of intermediate milestones shall not be released and be converted into recovery

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

6.5 Contractor shall plan their work in such a manner so as to meet the above project schedule, in consultation with BHEL/ customer. To achieve the above schedule contractor shall work in the all the available fronts concurrently and be prepare for working in the shift operation as per the instruction of BHEL Engineer.

6.6 Completion of facilities shall be completed in all respects only when on successful erection, trial run of individual equipment's and successful commissioning, trial operation, attending punch points, handing over of the ESP & auxiliaries to the customer.

6.7 Work under the scope of this contract shall be deemed to have been completed in all respects only when so certified by BHEL. The decision of BHEL shall be final and binding on the contractor.

6.8 If the completion of work as detailed in the scope of work gets delayed beyond the contract/ completion period, the contractor shall request for an extension of the contract and BHEL at its discretion may extend the contract as per the GCC clause 2.11.

6.9 Commencement of performance guarantee shall be as per clause no.2.24 (Performance Guarantee for Workmanship) of General Conditions of Contract. **The commencement of guarantee period for the quality of the workmanship shall start from the date of trial operational acceptance of facilities/handing over to the customer, whichever is earlier**.

7.0 TERMS OF PAYMENT

7.1 BHEL Engineer will certify regarding the actual work executed in the measurement books and bills, which shall be accepted by the contractor in measurement book.

7.2 Contractor shall submit bills for the work completed under the specification, once in a month detailing work done during the month. The format for billing shall be approved by BHEL before raising invoices.

7.3 Subject to any deduction, which BHEL may be authorized to make under the contract, the contractor on the certificate of the Engineer at site be entitled for payment as explained hereunder.

7.3.1 PROGRESSIVE PAYMENT ON PRORATA BASIS

(I) 85% of Unit rates

SN	FGD Erection Works	%					
	PRO RATA PAYMENTS (85%)	**Structures & Ducts**	**Tanks**	**Rotating Machines**	**GGH**	**Insulation**	**Piping**
1.1	ON PRE-ASSEMBLY WHEREVER APPLICABLE (IF NOT APPLICABLE, THIS PORTION SHALL BE CLUBBED WITH PLACEMENT IN POSITION)	20	15	8			20
1.2	PLACEMENT IN POSITION	20	20	30		50	20
1.3	ALIGNMENT	20	20	30		15	10
1.4	WELDING/BOLTING/FIXING	20	20	15		20	15
1.5	COMPLETION OF NON DESTRUCTIVE EXAMINATION & STRESS RELIEVING/ HEAT TREATMENT (if not applicable, then this portion to be paid along with welding)	5	10	2			10
1.6	HANGERS & SUPPORTS ETC WHEREVER NECESSARY AS PER DRG						5
1.7	HYDRAULIC TEST OR PNEUMATIC TEST /HOLIDAY TEST (as applicable)						5

SN	FGD Erection Works	%					
	PRO RATA PAYMENTS (85%)	**Structures & Ducts**	**Tanks**	**Rotating Machines**	**GGH**	**Insulation**	**Piping**
1.8	COMPLETION OF SUPPORT STEEL SQUARENESS AND LEVELLING, EXPANSION ARRANGEMENT, HOUSING PANEL ERECTION AND ALIGNMENT, ERECTION, ALIGNMENT AND WELDING OF PEDESTALS				10		
1.9	COMPLETION OF ERECTION, ALIGNMENT AND WELDING OF SUPPORT BEARING, GUIDE BEARING, ROTOR POST, BOTTOM AND TOP CENTRE SECTIONS, HOT AND COLD END CONNECTING PLATES				16		
1.10	COMPLETION OF ERECTION AND ALIGNMENT OF MODULES				15		
1.11	COMPLETION OF ERECTION, ALIGNMENT AND WELDING OF PIN RACK ASSEMBLY AND DRIVE ASSEMBLY				12		
1.12	COMPLETION OF SEALS SETTING				17		
1.13	ERECTION, ALIGNMENT AND WELDING OF LUBE OIL SYSTEMS, CLEANING DEVICE, FIRE SENSING DEVICE, DELUGE AND WATER WASH LINES, OBSERVATION PORT AND LIGHTING ASSEMBLIES AND OTHER ACCESSORIES				14		
1.14	COMPLETION OF GGH ERECTION				1		
1.15	**TOTAL FOR PRO RATA PAYMENTS (TOTAL 85%)**	**85**	**85**	**85**	**85**	**85**	**85**

(II) Stage/Milestone Payments (15%)

SN	Stage/Milestone Payments	%					
		Structures & Ducts	Tanks	Rotating Machines	GGH	Insulation	Piping
2.1	Air & Gas Tightness Test for Ducts (LHS & RHS)	2 X 1 %			2	2 X 2 %	
2.2	Completion of Trial run of Slurry Pumps			2			2
2.3	Completion of Water Fill Test (Tanks/Absorber)	2	6				
2.4	Trial run of Wet Ball Mills			2 X 1 %			2
2.5	Trial run of Oxidation Blowers			2 X 1 %		1	1
2.6	Trial run of Gypsum Dewatering System			2			2
2.7	Trial run of GGH				4	3	
2.8	Trial run of FGD System	3	2	2	4	2	2
2.9	Painting	4	3	1	1	1	2
2.10	Material Reconciliation	1	1	1	1	1	1
2.11	Area cleaning, temporary structures cutting/removal and return of scrap	1	1	1	1	1	1
2.12	Punch List points/pending points liquidation	1	1	1	1	1	1
2.13	Completion of Contractual Obligation	1	1	1	1	1	1
2.14	**TOTAL FOR STAGE / MILESTONE PAYMENTS (15%)**	**15**	**15**	**15**	**15**	**15**	**15**
2.15	**TOTAL I + II**	**100**	**100**	**100**	**100**	**100**	**100**

***- If any of the milestone payment not is applicable, then respective the portion is to be paid along with Trial run of FGD System.**

Note:

1. **The Terms of payment is only for enabling release of payments through RABs and is not indicative of the actual quantum or value of work**
2. **If the commissioning activities could not be carried out due to no fault of contractor, BHEL Site in-charge, at his discretion, after recording reasons for exercising such option, can split and release payment up to 50% of milestone payment on completion of work, to the extent possible, required for carrying out that particular milestone/ commissioning activity.**
3. **In line with GCC clause 2.23.1.(v) to facilitate part payment, BHEL Site Engineer at his discretion may further split the contracted rates/percentages to suit site conditions, cash flow requirements according to the progress of work.**

8.0 TAXES & DUTIES

8.1.1 Price quoted should be inclusive of all applicable Taxes/charges but **Excluding GST**. The Contractor shall pay all other taxes, fees, royalty, commission etc. which may be levied on the contractor in executing the contract. In case BHEL is forced to pay any of such taxes, it shall be recovered from Contactor's bills or otherwise as deemed fit.

GST Shall be payable extra as per following:

8.1.2 Contractor/Vendor has to issue invoice indicating HSN/SAC code, Description, Value, Rate, applicable tax and other particulars in compliance with the provisions of relevant GST Act and Rules made thereunder. With the implementation of e way bill provisions, contractor shall comply with same as applicable.

8.1.3 Vendor has to submit GST compliant invoice within seven days from the due date of invoice as per GST Law. In case of delay, BHEL reserves the right of denial of GST payment if there occurs any hardship to BHEL in claiming the input thereof. In case of goods, vendor has to provide scan copy of invoice & GR/LR/RR to BHEL before movement of goods starts. Special care should be taken in case of month end transactions.

8.1.4 GST amount claimed in the invoice shall be released on fulfilment of all the following conditions by the Contractor : -

a. Supply of goods and/or services have been received by BHEL.
b. Original Tax Invoice has been submitted to BHEL.
c. Respective invoice has appeared in BHEL's GSTR - 2A for the month corresponding to the month of invoice. Alternatively, BG of appropriate value may be furnished which shall be valid at least one month beyond the due date of confirmation of relevant payment of GST on GSTN portal or sufficient security is available to adjust the financial impact in case of any default by the contractor.

8.1.5 TDS under GST law as applicable shall be deducted.

8.1.6 Contractor shall be solely responsible for discharging his GST liability according to the provisions of GST Law and BHEL will not entertain any claim of GST/interest/penalty or any other liability on account of failure of contractor in complying the provisions of GST Law or discharging the GST liability in a manner laid down thereunder

8.1.7 In case declaration of any invoice is delayed by the vendor in his GST return or any invoice is subsequently amended/altered/deleted on GSTN portal which results in any adverse financial implication on BHEL, the financial impact thereof including interest/penalty shall be recovered from the Contactor's due payment.

8.1.8 Any denial of input credit to BHEL or arising of any tax liability on BHEL due to non-compliance of GST Law by the Contractor in any manner, will be recovered along with liability on account of interest and penalty (if any) from the payments due to the Contactor.

8.1.9 The admissibility of GST, taxes and duties referred in this chapter or elsewhere in the contract is limited to direct transactions between BHEL & its Contractor. BHEL is not

responsible for any liability that may arise due to any transaction beyond the direct transaction between BHEL & its Contractor.

8.1.10 **Variation in Taxes & Duties:**

Any upward variation in GST shall be considered for reimbursement provided supply of goods and services are made within schedule date stipulated in the contract or approved extended schedule for the reason solely attributable to BHEL. However downward variation shall be subject to adjustment as per actual GST applicability.

In case the Government imposes any new levy/tax on the output service/goods after price bid opening, the same shall be reimbursed by BHEL at actual. The reimbursement under this clause is restricted to the direct transaction between BHEL and its contactor only and within the contractual delivery period only.

In case any new tax/levy/duty etc. becomes applicable after the date of Bidder's offer but before opening of the price Bid, the Bidder/Contractor must convey its impact on his price duly substantiated by documentary evidence in support of the same before opening of price bid. Claim for any such impact after opening the price bid will not be considered by BHEL for reimbursement of tax or reassessment of offer.

8.1.11 **Modalities of Tax Incidence on BHEL:** Where GST law permits more than one option or methodology for discharging liability of tax/ levy/ duty; the contractor shall approach BHEL before choosing any option to discharge his tax liability. BHEL shall have the right to direct the contractor to adopt the appropriate option considering the amount of tax liability on BHEL as well as procedural simplicity with regard to assessment of the liability.

The option chosen by BHEL shall be binding on the contractor for discharging the obligation of BHEL in respect of the tax liability to the contractor.

8.2 BUILDING & OTHER CONSTRUCTION WORKERS (REGULATION OF EMPLOYMENT AND CONDITIONS OF SERVICE) ACT, 1996 (BOCW Act) AND RULES OF 1998 READ WITH BUILDING & OTHER CONSTRUCTION WORKERS CESS Act, 1996 & CESS RULES, 1998.

In case any portion of work involves execution through building or construction workers, then compliance to the above titled Acts shall be ensured by the contractor and contractor shall obtain license and deposit the cess under the Act. In the circumstances it may be ensured as under:-

8.2.1 It shall be the sole responsibility of the contractor in the capacity of employer to forthwith (within a period of 15 days from the award of work) apply for a license to the Competent Authority under the BOCW Act and obtain proper certificate thereof by specifying the scope of its work. It shall also be responsibility of the contractor to furnish a copy of such certificate of license / permission to BHEL within a period of one month from the date of award of contract.

8.2.2 It shall be the sole responsibility of the contractor as employer to ensure compliance of all the statutory obligations under these act and rules including that of payment / deposit of 1% cess on gross payment made for value of work involving building or construction workers engaged by the contractor within a period of one month from the receipt of payment.

8.2.3 It shall be the responsibility of the sub-contractor to furnish the receipts /challans towards deposit of the cess together with the number, name and other details of beneficiaries (building workers) engaged by the sub-contractor during the preceding month.

8.2.4 It shall be the absolute responsibility of the sub-contractor to make payment of all statutory payments & compensations to its workers including that is provided under the Workmen's Compensation Act, 1923.

8.2.5 The contractor shall, however ensure before deposit of any BOCW Cess, that customer is not depositing the same in order to avoid excess deposit of cess.

8.2.6 The contractor shall bear cost of BOCW cess either by way of deposit or through recovery by BHEL in case the same is deposited by the customer.

8.2.7 In case of failure in above mentioned compliances, BOCW Cess @ 1% as well as applicable penalty as specified in BOCW Act/Rules shall be deducted from the contractor.

Notes

1) The Gross amount is to be construed as cost of construction in line with the provisions of the BOCW of the BOCW Cess act and in case of compliance by customer by way of deduction at source in line with clause No 3(2) of the act an equitable adjustment to the relatable cost of construction attributable to the bidder shall be made in terms of clause no 8.2 of TCC.

2) In case compliance by customer by way of deduction at source in line with clause no 3(2) is not resorted to, the compliance of BOCW Cess act shall be ensured by the bidder in line with the provisions of BOCW Cess act in terms of clause no 8.2.2 of TCC.

3) The bidder may consider the cost of construction for levy of BOCW Cess inclusive of GST, however, due to whatsoever reason if the GST does not form the cost of construction for levy of aforesaid Cess an equitable adjustment thereof shall be made to the contract price.

9.0 In order to give Phillip to Pradhan Mantri Kaushal Vikas Yojana:

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

ANNEXURE- A

WEIGHT SCHEDULE OF FGD AND AUXILARIES AT 1X660 MW PANKI TPS

S.No	DPN	PG-MA	PGMA_DESCRIPTION	PGMA weights (Kg)	CATEGORY
1	30	FW212	SLURRY RECIRCULATION PUMP SYSTEM	55000	R
2	200	FW213	ABSORBER SYSTEM INTERNALS FGD	55000	S
3	295	FW214	ABSORBER BAFFLE GRATING	1000	S
4	205	FW215	MIST ELIMINATOR & ACCESSORIES	30000	S
5	40	FW216	ABSORBER BAFFLE GRATING SUPPORT	8000	S
6	150	FW217	ABSORBER ME SUPPORT	41000	S
7	75	FW218	ABSORBER SPRAY PIPE SUPPORT	21000	S
8	35	FW219	ABSORBER SYSTEM-BASE	18000	S
9	71	FW220	ABSORBER SYSTEM-STRUCTURES	250800	S
10	81	FW221	ABSORBER SYSTEM-CASING BOTTOM	160000	S
11	120	FW222	ABSORBER SYSTEM-CASING TOP	250000	S
12	640	FW223	ABSORBER SYSTEM ACCESSORIES	5000	S
13	231	FW226	EMERGENCY QUENCH WATER TANK	5000	T
14	270	FW227	EMERGENCY QUENCH SYSTEM	4000	S
15	225	FW228	ABSORBER-W/D INTERFACE	8000	S
16	370	FW229	W/D WASH SYSTEM	4000	S
17	80	FW230	OXIDATION BLOWER & ACCESSORIES	20000	R
18	66	FW231	ABSORBER SHEAR PLATE	2000	S
19	105	FW232	DUCT SUPPORT BTW BYPASS DUCT & BUF/GGH	39000	S
20	110	FW233	DUCT SUPPORT BTW BUF/GGH AND ABSORBER	10000	S
21	195	FW234	DUCT SUPPORT BTW ABSORBER AND STACK/BYPASS	47000	S
22	345	FW235	SPECIAL FASTENERS	1200	S
23	125	FW236	STRUCTURES FOR RC PUMP HOUSE	105000	S
24	140	FW237	GALLERIES & RAILING FOR STAIR	10000	S
25	591	FW240	STEAM PIPELINE DISTRIBUTION	5000	P
26	685	FW243	SLURRY DISTRIBUTION SYSTEM- RC PUMP & ABSORBER	50000	P
27	690	FW244	OXIDATION AIR DISTRIBUTION SYS	10000	P
28	695	FW249	HANDLING EQUIPMENT - RC PUMP	10000	R
29	235	FW250	FLOOR GRILLS-UNITIZED SYSTEM	20000	S
30	275	FW251	EXPANSION JOINT - METALLIC	17692.43	S
31	375	FW252	EXPANSION JOINT- NON METALLIC	30000	S
32	285	FW255	DUCT BETWEEN BYPASS AND BUF/GGH/ABSORBER	431711.2	S
33	100	FW256	DUCT BETWEEN BUF/GGH AND ABSORBER	100000	S

S.No	DPN	PG-MA	PGMA_DESCRIPTION	PGMA weights (Kg)	CATEGORY
34	190	FW257	DUCT BETWEEN ABSORBER AND BYPASS/STACK	274000	S
35	376	FW259	GGH INTERCONNECTING DUCT	10000	S
36	85	FW260	DUCT STRUCTURE BETWEEN BYPASS AND BUF/GGH/ABSORBER	318000	S
37	91	FW261	DUCT STRUCTURE BETWEEN BUF/GGH AND ABSORBER	45000	S
38	185	FW262	DUCT STRUCTURE BETWEEN ABSORBER AND BYPASS/STACK	252000	S
39	595	FW267	INSULATION MATERIALS FOR DUCT	45000	I
40	600	FW268	FIXING COMPONENTS FOR DUCT	50000	I
41	605	FW269	CLADDING SHEET FOR DUCT	15000	I
42	385	FW280	FOUNDATION MATL FOR DUCT STRUCTURE	11670.71	S
43	10	FW281	FOUNDATION MATL FOR ABSORBER	50000	S
44	15	FW282	FOUNDATION MATL FOR ELEVATOR	4000	S
45	25	FW283	FOUNDATION MATL FOR RC PUMP SHED	10000	S
46	350	FW285	SUPRTING STR FOR EMERGENCY QWT	10000	S
47	145	FW292	STRUCTURES FOR ELEVATOR	34000	S
48	596	FW294	INSULATION MATERIALS FOR GGH	25000	G
49	601	FW295	FIXING COMPONENTS FOR GGH	30000	G
50	606	FW296	CLADDING SHEET FOR GGH	5000	G
51	240	FW610	GALLERIES&RAILINGS FOR ABSORBER	70000	S
52	241	FW611	GALLERIES AND RAILINGS FOR GGH	10000	G
53	250	FW613	GALLERIES AND RAILINGS FOR DUCTS	20000	S
54	610	FW712	FLOOR GRILLS-COMMON SYSTEM	30000	S
55	386	FW701	SLURRY PUMPS & ACCESSORIES	40000	R
56	155	FW702	WATER PUMPS & ACCESSORIES	20000	R
57	276	FW710	MONORAIL FOR HOIST & CRANES	30000	S
58	680	FW713	CHAIN PULLEYS	15000	S
59	625	FW714	HOISTS	25000	S
60	335	FW717	MAN HOLE DOOR	10000	S
61	160	FW720	AGITATORS	30000	R
62	255	FW721	AGITATOR SUPPORT	20000	S
63	170	FW722	GALLERIES & RAILINGS FOR TANK	15000	S
64	395	FW723	AIR CANNON - SILO	3000	T
65	400	FW724	BAG FILTER & FAN ASSEMBLY- SILO	3000	R
66	410	FW725	NOZZLES & FLANGES	20000	S
67	201	FW730	LIMESTONE SILO STRUCTURE	295000	S
68	420	FW731	LIMESTONE SILO	224682.5	T

S.No	DPN	PG-MA	PGMA_DESCRIPTION	PGMA weights (Kg)	CATEGORY
69	260	FW733	LIMESTONE SILO APPROACH PLATF	5000	S
70	230	FW735	LIMESTONE MILL & ACCESSORIES	278000	R
71	90	FW738	GYPSUM BELT FILTER AND ACCESS	80000	R
72	20	FW740	FOUNDATION MATL FOR TANKS	8035.915	S
73	45	FW742	LIMESTONE SLURRY STORAGE TANK	68881.41	T
74	50	FW743	AUXILIARY ABSORBER TANK	70717.43	T
75	55	FW744	FILTRATE TANK	5138.554	T
76	60	FW745	WASTE WATER TANK	11978.93	T
77	65	FW747	HYDROCLONE WASTE WATER TANK	21244.22	T
78	70	FW748	PROCESS WATER TANK	10477.16	T
79	175	FW749	ALL TANKS INTERNAL STRUCTURE	15000	T
80	425	FW751	PROCESS WATER PIPE & ACCESSORIES	50000	P
81	430	FW752	COOLING WATER PIPE & ACCESSORIES	15000	P
82	435	FW753	SLURRY PIPE & ACCESSORIES	42000	P
83	440	FW754	SERVICE AIR PIPE & ACCESSORIES	12000	P
84	445	FW755	INSTRUMENT AIR PIPE ACCESSORIE	12000	P
85	265	FW760	FOUNDATION MATL FOR PIPE RACKS	8000	S
86	280	FW761	STRUCTURE FOR PIPERACKS	50000	S
87	115	FW762	FNDN MATL FOR SILO STRUCTURE	5000	S
88	300	FW763	FNDN:MATL FOR SUB PIPE RACKS	2000	S
89	315	FW765	STRUCT:FOR SUB PIPE RACK	10000	S
90	310	FW766	PLATFORM FOR PIPE RACK	15000	S
91	325	FW767	PLATFORM FOR SUB PIPE RACK	5000	S
92	305	FW768	TRESTLE FOR MAIN PIPE RACK	89000	S
93	320	FW769	TRESTLE FOR SUB PIPE RACKS	40000	S
94	180	FW784	HSFG BOLTS	5000	S
95	156	FW785	BELT FILTER WASHING TANK	3000	T
96	286	FW787	STRUCTURES INSIDE GDWB & BMB	20000	S
97	405	FW798	AIR RECEIVERS	18000	T
98	450	FW802	NEUTRALISATION TANK & ACCESSOR	5932.24	T
99	650	FW814	ROOFING SHEET	5000	S
100	475	FW815	RC PUMP INELT & OUTLET VALVE	40000	P
101	480	FW816	Manual Butterfly valves- Utility	1400	P
102	485	FW817	Motorized Butterfly valves- Utility	1000	P
103	490	FW818	Pneumatic Butterfly valves- Utility	500	P
104	495	FW819	Manual Butterfly valves- Limestone Slurry	2500	P
105	500	FW820	Motorized Butterfly valves- Limestone Slurry	5000	P
106	505	FW821	Pneumatic Butterfly valves- Limestone Slurry	1000	P

S.No	DPN	PG-MA	PGMA_DESCRIPTION	PGMA weights (Kg)	CATEGORY
107	510	FW822	Manual Butterfly valves- Gypsum Slurry	3500	P
108	515	FW823	Motorized Butterfly valves- Gypsum Slurry	9000	P
109	540	FW828	Manual Gate valves- Utility	14000	P
110	545	FW829	Motorized Gate valves- Utility	1000	P
111	590	FW834	Manual Globe valves- Utility	4300	P
112	55	FW840	Ceramic Valves	500	P
113	560	FW841	Control Valves	600	P
114	565	FW842	Manual Pinch Valves- Gypsum Slurry	500	P
115	570	FW845	Ball Valves- Water	500	P
116	575	FW848	Check Valves- Water	800	P
117	580	FW851	Diaphragm valves- Slurry	800	P
118	585	FW854	Root Valves for Instrumentation	3100	P
119			WET BALL MILL MOTORS	4150	R
120			OXIDATION BLOWER MOTORS	4160	R
121			RC PUMP MOTORS	10500	R
122	322	52 010	Rotor assy	100000	G
123	323	52 024	Heating element baskets, Drive assembly, Support & Guide bearing, Cleaning device, OCU, Seal air, Low leakage fan system, HP,LP pump system etc., for GGH	352000	G
124	324	52 030	Rotor Housing for GGH	23500	G
125	331	52 041	Hot end Connecting plate	48000	G
126	326	52 042	Cold end Connecting plate	50000	G
127	328	52 220	General Details	20000	G
128			SS MATERIAL	5000	SS
			TOTAL Wt. (Kg)	**5587472.699**	
			TOTAL Wt. (MT)	**5587.47**	

CATEGORY	ID	WT. (MT)
STRUCTURE	S	3505.11
TANKS	T	463.05
PIPING	P	286.00
ROTARY	R	554.81
INSULATION	I	110.00
GGH	G	663.50
SS	SS	5.00
TOTAL (MT)		**5587.47**

Notes:

1. Weight mentioned in the Annexures-A is tentative only and based on the engineering /drawings /documents available as on date of NIT and liable for variation.
2. The contractor is required to erect actual tonnage (irrespective of any variation plus or minus) which may be necessary to complete their work and commissioning FGD system in all respects as detailed in tender specifications and as per the drawings/ documents for which payments shall be released on finally accepted tonnage rates.
3. The contractor undertakes to erect / commission actual quantities as per advice of BHEL Engineer and accordingly the final contract price shall be worked out on the basis of quantities actually erected at site and payments will also be regulated for the same.

11.0 GENERAL

11.1 The intent of this specification is to provide services for execution of project according to most modern and proven techniques and codes. The omission of specific reference to any method, equipment or material necessary for the proper and efficient services towards installation of the plant shall not relieve the contractor of the responsibility of providing such services/ facilities to complete the work or portion of work awarded to him. The quoted/ accepted rates/ lump sum price shall deem to be inclusive of all such contingencies.

11.2 The contractor shall carry out the work in accordance with standard practices / codes / instructions / drawings / documents / specification/ manuals supplied by BHEL from time to time.

11.3 The work shall conform to dimensions and tolerances given in various drawings and documents that will be provided during execution. If any portion of work is found to be defective in workmanship, not conforming to drawings or other stipulations, the contractor shall dismantle and redo the work duly replacing the defective materials at his cost failing which the job will be carried out by BHEL by engaging other agencies / departmentally and recoveries will be affected from contractor's bills towards expenditure incurred including BHEL's usual overhead charges.

11.4 Following shall be the responsibility of contractor and have to be provided within finally accepted rates/ prices:

- Provision as required of all types of labour, supervisors, engineers, watch and ward, tool & tackles, calibrated inspection, measuring and test equipment as specified and otherwise required for the work, consumables for erection, testing and commission including material handling.
- Proper out-turn as per BHEL’s plan and commitment
- Completion of work as per BHEL schedule
- Good quality and accurate workmanship for proper performances of equipment
- Repair and Rectification
- Preservation/ Re-conservation of all components during storage/ reaction till handing over

11.5 The contractor shall carry out the work in accordance with standard practices/ codes/ instruction/ drawings/ documents/ specification/ manuals supplied by BHEL from time to time.

11.6 Contractor shall execute the work as per sequence and procedure prescribed by BHEL at site. BHEL engineer, depending upon the availability of materials, fronts, etc, will decide the sequence of erection and methodology. No claims for extra payment from the contractor will be entertained on the grounds of deviation from the method of erection adopted in erection of similar jobs or for any reason whatsoever.

11.7 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.

11.8 The quantities indicated in the tender specification are approximate and are liable for variation and alteration at the discretion of BHEL. The quoted unit rate shall be applicable for any additional product group also, if included at a later stage integral to the main scope of work/ package envisaged. The work executed shall be measured and priced as per the unit rate arrived at for each work area as mentioned in the relevant clauses.

11.9 The terminal points as decided by BHEL shall be final and binding on the contractor.

11.10 Contractor has to work in close co-ordination with other erection agencies at site. BHEL engineer will co-ordinate area clearance. In a project of such magnitude, it is possible that the area clearance may be less / more at a particular given time. Activities and erection program have to be planned in such a way that the milestones are achieved as per schedule / plans. Contractor shall arrange & augment the resources accordingly.

11.11 **HOUSE KEEPING:** The contractor is supposed to carryout housekeeping of the work area on regular basis to keep the work place neat and tidy and available for the SAFE working. The scrap, generated daily during the Execution activities, is to be dumped at designated area as decided by BHEL/ customer on daily basis. The erection materials issued to the contractor and kept near the work are should also be staged properly at site. Compliance report on above shall be submitted by the contractor to BHEL on Daily basis. In case the contractor fails to do so, BHEL have rights to carry out the same from the other party at Risk & Cost of the contractor. The cost applicable with BHEL overheads shall also be recovered from the monthly running bills of contractor.

12.0 CIVIL WORKS, FOUNDATION, GROUTING

12.1 BHEL/ Customer shall provide all equipment foundations. For the correctness of these foundation as per drawings, the contractor shall check the dimensions & locations of the foundations, pockets, anchor-bolt pitch. Further, top elevation of foundations shall be checked with respect to benchmark. All minor adjustments of foundation level, dressing and chipping of foundation surfaces up to 50mm, enlarging the pockets in foundations, cleaning using compressed air, etc., as may be required for the erection of equipment/ plants shall be carried out by the contractor.

12.2 While on the job, care is essential to avoid too much chipping and resultant lowering of level. In case of excess chipping, contractor has to arrange additional packer plates as per requirements provided BHEL Engineer allows it. When required by manufacturers, the embedded sub-sole plates shall be scraped and checked with Prussian blue to get the required contact with frames.

12.3 The required packer plates shall be provided by BHEL free of cost. 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.

12.4 Contractor shall ensure perfect matching of packer plates including machining, scraping and blue matching with foundation by dressing the foundation, as well as perfect matching between the packer plates and the base plate of equipment to the satisfaction of BHEL Engineer. If required the packer plates may have to be aligned and fixed on the foundations using special high strength, non-shrinking and quick setting grouts. The minimum thickness below the packer plate should be 20mm. The material required for this alignment has to be arranged for by the contractor at his cost.

12.5 **Complete grouting of structures equipment, including anchor/ foundation bolts, beneath base, base hollows, etc. as may be applicable, is EXCLUDED in the scope of contractor. Grouting will be carried out by BHEL civil agency.**

While grouting will be carried out by other agency, the contractor has to ensure that all the matching joints which are not to be grouted shall be kept free from the grouting mixture by applying tape or any other alternative method approved by Engineer. All assistance required has to be provided by the contractor. If required, decoupling of equipment's 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.

Contractor shall check and verify the alignment of equipment. The contractor has to ensure that all the matching joints which are not to be grouted shall be kept free from the grouting mixtures by applying tape or any other alternative method approved by Engineer. All assistance required has to be provided by the contractor.

12.6 Contractor shall check and verify the alignment of equipment, alignment of shafts of rotating machines, the slopes of all bearing pedestals, centering of rotors with respect to their sealing bores, coupling etc. as applicable and the likes items to ensure that no displacement had taken place during post grouting check-up and verification. Such pre and post grout records of alignment details shall be maintained by the contractor in a matter acceptable to the Engineer.

13.0 MATERIAL HANDLING, TRANSPORTATION AND SITE STORAGE

The scope of the work will comprise of but not limited to the following:
(All the works mentioned hereunder shall be carried out within the accepted rate unless otherwise specified.)

13.1 Loading at BHEL / Customer stores and storage yard, transport to site, unloading at site / working area of equipment, placement on respective foundation / location, fabrication yard, pre-assembly bay or at working area are in the scope of work. The scope includes taking materials / Equipments from customer stores / storage yard also. Contractors Quoted / Accepted rate shall be inclusive of the same. Required cranes, tractors, trailer or trucks/ slings/ tools and tackles/ labour including operators, fuel, lubricants etc. for Loading & unloading of materials will be in the scope of contractor.

13.2 The storage yard is located inside the Main Plant Boundary, in more than one location.

13.3 Some consignments like ODC consignments may be unloaded near to erection site as per space availability.

13.4 Loading at storage yard and transporting to site, unloading at site / pre assembly area or at working area, is in the scope of work. Required cranes for loading & unloading of materials, trailer shall be in the scope of contractor. The contractor shall provide any fixtures, concrete blocks & wooden sleepers, sandbags which are required for temporary supporting of the components at site.

13.5 The equipments/ materials from the storage yard shall be moved in sequence to the actual site of erection/ location at the appropriate time as per the direction of BHEL Engineer so as to avoid damage / loss of such equipment at site.

13.6 Contractor shall plan and transport equipments, components from storage yard to erection site in such a manner and sequence that material accumulation at site does not lead to congestion at site of work.

13.7 Sometimes it may become necessary for the contractor to handle certain unrequited components in order to take out the required materials. The contractor has to take this contingency also into account. No extra payment is payable for such contingencies.

13.8 Materials shall be stacked neatly, preserved and stored in the contractor's shed / work area in an orderly manner. In case it is necessary to shift and re-stack the materials kept

at work area / site to enable other agencies to carry out their work, same shall be done by the contractor at no extra cost.

13.9 All pipe and tube ends shall be covered with plastic caps or will be closed with wooden plugs as the case may be.

13.10 The contractor shall take necessary measures to see that all the machined surfaces are preserved and covered.

13.11 The contractor shall take all such measures as may be reasonably necessary to ensure that its arrangements and those of its sub-contractors with respect to the transport of Goods, Materials and Labour to the site do not interfere with local traffic in the vicinity of the site and where such interference is unavoidable shall make such special arrangements as may be reasonably required to minimize the effect of such interference.

14.0 ERECTION

The scope of the work will comprise of but not limited to the following:
(All the works mentioned hereunder shall be carried out within the accepted rate unless otherwise specified.)

14.1 All normal erection and assembly techniques necessary for completion of works under this specification and magnitude have to be carried out. The omission of specific technique/ method/ process does not absolve the contractor of his responsibility for the particular operation. These would include,

a) Scaffolding and rigging operations,
b) Machine/ flame/ electric cutting, grinding, welding, radiography and stress relieving
c) Fitting, Fettling, Filing, Straightening, Chamfering, Chipping, Scrapping, Reaming as cleaning, checking, levelling, blue matching, aligning and assembly
d) Machining, Surface grinding, drilling, doweling, shaping
e) Temporary erections for alignment, dismantling of certain equipment for checking, cleaning, servicing and site fabrication
f) Insulation and painting

14.2 Any fixtures, scaffolding materials, approach ladder, concrete block supports, steel structures required for temporary supporting, pre-assembly or checking, welding, lifting and handling during pre-assembly and erection shall be arranged by contractor at his cost.

14.3 Loading at storage yard after identification, transporting to site or preassembly yard / erection site, unloading at pre-assembly yard / erection site, pre-assembling of equipments wherever required for inspection or checking, erecting the material, aligning, welding, fastening, supporting, carrying out the necessary non- destructive testing as may be required, providing services for trial operation, pre-commissioning activities up to the time of completion of commissioning activities and supply and application of final painting. The contractor should erect and assemble the components as per the drawings issued and the number of components supplied to him will be on the basis of shipping list / completion schedules. Complete pre assembling of components are in the scope of the contractor.

14.4 Any other systems / Components which are integral to FGD & auxiliaries, supplied by BHEL manufacturing units are also to be erected and commissioned by the contractor within the quoted / accepted tonnage rate / lump sum value.

14.5 No member of any ladder/ structure/ platform should be cut without specific approval of BHEL. In case it is necessary to cut, the contractor shall rectify / repair in a manner acceptable to BHEL/ customer without any additional cost.

14.6 The contractor shall erect scaffolding/ temporary platforms for erection. These should be replaced when not found suitable during erection work and dismantled on work completion and removed from site.

14.7 It should be responsibility of the contractor to provide ladders on columns for initial work till such time stairways are completed. For this, the ladder should not be welded on the column and should be pre-fabricated clamping type ladders. No temporary welding on any structural members is permitted except under special circumstances with approval of BHEL. In case it is absolutely necessary then the contractor shall cut the temporary structure and rectify the column as directed by the engineer.

14.8 The contractor is strictly prohibited in using the FGD/ Auxiliary components for any temporary supporting or scaffolding works etc. in case of such misuse a sum of determined by Engineer will be recovered from contractor's bills.

14.9 Below mentioned erection sequence is **indicative only and only to give the general idea** to the contractor for absorber erection:

a) Marking and packer liner setting
b) Bottom Plate installation
c) 1st Stage casing Panel installation
d) Baffle Plate Installation
e) Scaffolding and Structure upto 24.8 m
f) 2nd stage casing panel installation
g) Scaffolding and Structure upto 28.5 m
h) 3rd stage casing panel installation
i) Inlet duct panel installation
j) Scaffolding structure upto 31.75 m
k) 4th stage casing panel installation
l) Scaffolding and Structure up to 35.4m and spray pipe installation
m) 5th stage casing panel installation
n) Scaffolding and Structure up to 39 m.
o) 6th stage casing panel installation
p) Scaffolding and Structure up to 43 m.
q) 7th stage casing panel installation
r) Scaffolding and Structure up to 47 m. and remaining structure erection
s) Ceiling panel installation
t) Rubber lining
u) Dismantling of scaffolding up to mist eliminator level

v) Absorber internals (Spray pipe and mist eliminator) installation
w) Dismantling of scaffolding up to spray pipe level
x) Absorber internals (Spray pipe and spray nozzle) installation
y) All scaffolding dismantling
z) Fiber grating installation
aa) Agitator installation

14.10 Casing Panel Installation

14.10.1 Splices of bottom plates at which casing panel are located shall be cleaned.

14.10.2 Location of casing shall be marked on the foundation. Then, according to the casing panel assembly drawings, the location of vertical splices between plates shall be marked

14.10.3 Temporary assembly of lower stage casing panel shall be done by Tack-weld the guide pieces to the bottom plate at prescribed intervals of inside and outside the circular marking.

14.10.4 Temporary assembly of upper stage casing panel shall be done As per Match marks which have been provided on the inside surface of the lower stage casing panel shall be matched to vertical splice line and assembled.

14.10.5 After that welding of the casing panel to be done the weld between lower stage casing panel and bottom plate shall be performed in a suitable time after the completion of vertical splice for lower stage casing panel.

14.10.6 Vertical splice shall be welded from side by back step method of 1/3 of wall plate width after the completion of assembly of upper wall plate. After the welding from outside, grinding from inside shall be performed with grinder. Welding of horizontal splices shall alternate across the 1st wall. 2nd wall weld's shall be laid simultaneously.

14.10.7 Spacers used for root gap of welds shall be removed.

14.10.8 Appurtenances such as manholes and nozzles shall be installed after marking on correct locations in accordance with the layout drawings. The time to install then shall be decided in consideration of site construction progress.

The location of large diameter nozzles which will be connected to rubber lined pipes shall be determined in accordance with the final piping locations which shall be set at the site.

14.11 Spray Pipe Installation

14.11.1 Check all concerned absorber dimensions, ie. tolerance of absorber casing, support beam location, absorber nozzle location, flange face location, bolt hole location, size and spacing etc., before Spray Pipe installation.

14.11.2 Install the temporary support on absorber nozzles for inserting Spray Pipe into absorber.

14.11.3 The temporary support shall be installed at almost the same height of bottom of Spray Pipe

14.11.4 Lift Spray Pipe up to the same height as absorber nozzle.

14.11.5 Insert the tip of Spray Pipe into the absorber, and unload the tip of Spray Pipe onto the temporary support.

14.11.6 Insert Spray Pipe into the absorber by using of chain block.

14.11.7 Insert bolt to Spray Pipe flange and Spray Pipe saddle, and tighten as temporary. Then check the horizontal level and insert shim plate to adjust the horizontal level. The level tolerance should be referred to specific drawing.

14.11.8 Tighten all the bolts and nuts. In case of dissimilar material between Spray Pipe flange (especially FRP made) and absorber flange, bolt tightening procedure should be strictly complied with the specific drawings in order to prevent the crack on the flanges.

14.11.9 Loosen the saddle setting bolts and nuts by half rotation to allow the Spray Pipe thermal expansion, and then lock the nuts by double nuts fixing.

14.12 Spray Nozzle

14.12.1 Modify the scaffolding for installation of Spray Nozzle.

14.12.2 Set the Spray Nozzle on the Spray Pipe flange, and tighten the bolts and nuts up to about 75% of full torque by using of torque wrench.

14.12.3 Check the horizontal level of Spray Nozzle face within the tolerance which is specified in the drawings, and tighten up to full torque. This level is most important for FGD performance.

14.12.4 The special care shall be taken to SiC made Spray Nozzle, since these are weak against mechanical shock and impact.

14.13 Mist Eliminator Installation

1. Check all concerned absorber dimensions, ie. tolerance of absorber casing, support beam location, bolt hole location, size and spacing etc., before installation of Mist Eliminator.
2. Insert the lower washing spray pipe into the absorber. In order to protect the FRP made pipe, do not slide the pipe on the support.
3. Insert the dedicated shim plates between pipe and pipe support, and fixing U-bands or U-bolts and external flanges.
4. Install the lower panel of Mist Eliminator and tightly coupled each other by means of comb brace and tie insulock.
5. Install the lower down washing spray pipe and upper up washing spray pipe as same manner as the above.
6. Install the upper panel of Mist Eliminator, and install upper washing spray pipe as same manner as the above.
7. After installation of Mist Eliminator, to protect the panels by means of load spreaders e.g. wooden planks to allow walking on them during further stage of installation.

14.14 Certain adjustments in length may be necessary while erecting pipelines/ ducts/ casing etc. The contractor should remove the extra lengths/ add extra lengths to suit the final layout after preparing edges afresh by adopting specified heat.

14.15 Suspensions for ducting will be supplied in running lengths, which shall be cut to size and adjusted as required. Ducts/ expansion bellows are displaced to site in loose walls plates/ pieces and these are to be assembled and welded at site along with stiffeners etc. before erection within finally accepted rates. All joints connecting duct expansion piece and dampers shall be seal welded on inside as well as on outside.

14.16 Mechanical erection works associated with the power cylinders, valves, valve actuators, etc. coming under various groups shall be provided by contractor within the finally accepted rates. The erection testing and commissioning of all the electrically operated valves, actuators and dampers is covered within the scope of this specification.

14.17 The contractor shall carry out trial run of all motors including checking the direction of rotation in the uncoupled condition. Checking of alignment and recoupling of the motor to the driven equipment as per instructions of BHEL engineer and to their satisfaction. 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. Vendor shall all necessary MMDs including the motorized insulation testers for the above test.

14.18 The contractor shall fabricate pipe, special bends etc, threading and welding required for installation lube oil system and carry out the acid cleaning of the fabricated piping. The contractor shall also service the lube oil system, carrying out the hydraulic test of oil coolers etc.

14.19 Contractor shall carry out kerosene testing of all bearing housings of various rotating equipment like pumps, fans, etc, as per BHEL engineer's instructions. Performance of hydro test of oil coolers of rotating machines and hydro test of other equipment as per BHEL engineer's instructions is included in the scope of work. Forced lube oil system of motors or rotating equipment form parts of the work under this specification.

14.20 Certain rotating machinery after initial runs and commissioning of the equipment have to be hot aligned as per the instructions of BHEL engineer. Cleaning fans, ducting etc. free of extraneous steel, scaffolding materials electrodes, all foreign materials, etc before trial run of rotating machinery and at various stages of pre-commissioning activities as per BHEL engineer's instruction, is within the scope of work.

14.21 Some of the rotating equipment and electrical motors are provided with protective greases only. Contractor shall arrange for cleaning of the same with kerosene or some other reagent. If necessary, dismantling some of the parts of the equipment world be necessary. He shall arrange for re-greasing/ lubricating them with recommended lubricants and for assembling back the dismantling parts, at quoted rate. Lubricants will, however, be4 supplied free of cost by BHEL.

14.22 After initial trial of rotating equipment, control and power cabling for motors and other equipment/ instrumentation shall have to be disconnected for checking alignment and re-setting/ re-alignment/ hot alignment. Contractor shall have to arrange for disconnecting control and power cabling after realignment. Quoted tonnage rate shall be inclusive of the above.

14.23 Packer Plates supplied may have to be machined to the correct dimensions. It may also be necessary to blue match the same with each other / with equipment/ with foundations as per BHEL instructions.

14.24 Contraction shall arrange changing of preservative oil in the gearboxes, journal and other bearing assemblies of rotating equipment when in storage areas or after erection of equipment as the case may be as per the instructions of BHEL engineer. Necessary

lubricants/ oil will be supplied by BHEL and the same will be drawn by contractor from BHEL/ customer's stores and transporting to site. No additional payment will be made under regular dispatch-able unit (DU) number against Product Group Main Assembly (PGMA) and appearing in the sipping list. Prior to the commissioning of the equipment, oil should be drained and collected in drums provided by BHEL and returned to BHEL/ customer's stores.

14.25 The fans, mills and other rotating machines shall be checked for clearances and other vital tolerances. Necessary assistance for balancing of equipment during trial run, if required, shall be provided by the contractor free of cost.

14.26 Whenever required the contractor shall arrange for pre-qualification of process task performers.

14.27 Ducts/ expansion bellows (metallic & non-metallic) are normally supplied in loose wall plates/ segments and these are to be assembled and welded at site before erection. Correction of oval ties/ distortion of ducts, expansion bellows, etc occurred during transportation / handling are to be carried before erection as part of work. Erection of mechanical components of non- metallic joints is included in the scope of work. All joints connecting ducts, expansion pieces and dampers shall be seal welded. These welds have to be made leak proof and tested as per technical instruction/ requirement.

14.28 Non specified jobs at the interface/ terminal points like bolting welding, gasket changing etc have to be done by the contractor within the quoted price.

14.29 Instrument tapping coming on the FGD and associated equipments to be welded/ fitted by the contractor within the quoted price.

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

14.31 Actuator/ drives of 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.

14.32 All rotating machines and equipment shall be cleaned, lubricated, checked for their smooth rotation, if necessary by dismantling and refitting before erection. If, in the opinion of Engineer, the equipment is to be checked for clearance, tolerance at any stage of work or during commissioning period, all such works are to be carried out by contractor at his cost.

14.33 All the shafts of rotating equipment shall be properly aligned to those of the matching equipment within design tolerances. All bearings, shafts and other rotating parts shall be thoroughly cleaned and suitably lubricated before starting.

14.34 All the motors and equipment shall be suitably doweled after alignment of shafts with taper/ parallel machined dowels as per the direction of the Engineer. Dowel pins required are to be machined by the contractor at his own cost. However, materials for dowel pins shall be issued by BHEL free of cost.

14.35 The HT motor bearings shall be blue matched at site and checked for bearing clearances. The contractor if required shall carry out scraping of bearing housing. No extra claim for blue matching up to 1mm initial gap will be entertained.

14.36 The contractor at no extra cost to BHEL shall carry out servicing and realignment of skid mounted equipment.

14.37 Certain instruments like pressure gauges, pressure transmitters, temperature gauges, flow switches and indicators etc are received in assembled condition as integral part of equipment. Contractor shall be responsible for safe receipt, installation and custody of these instruments supplied mounted on skids/ equipment. The calibration of skid/ equipment mounted instruments shall be arranged by BHEL through other agency engaged for C&I. Contractor will be informed by BHEL engineer about the details of C&I agency. The contractor shall coordinate with the C&I agency for removal, calibration and re-installation of instruments. Though C&I agency will remove and reinstall the instruments after calibration, the contractor for this package will maintain the list of all the instruments after removed & reinstalled. Instruments prior to removal and after reinstallation shall be considered in custody of the contractor for this package.

14.38 All electrical panels, control gears, motors and such other devices shall be properly dried by heating to improve IR value, before they are energized. Bearings, slip rings, commutators and other exposed parts shall be protected against moisture ingress and corrosion during storage and periodically inspected.

14.39 The contractor shall completely erect and test all the piping systems, covered in the specification including sampling lines up to and including sample coolers, hangers & supports, valves and accessories in accordance with the drawings furnished. This includes all necessary bolting, welding, pre-heating, stress relieving, testing, cleaning and painting. System shall be demonstrated in condition to operate continuously in a manner acceptable to the Engineer. Welding shall be used throughout for joining pipes except

where flanged, screwed or other type joints are specified or sown on the drawings. All piping shall be erected true to the lines and elevation as indicated in the drawings.

14.40 Pipes sent in standard length shall be cut to suit the site conditions and the layouts. Tubes or pipes wherever deemed to be conveniently will be sent in running lengths with sufficient bends. Bends up to 65mm nominal bore will have to be fabricated at site. Only cold cutting methods are to be employed for cutting of pipes and tubes irrespective of the size and material. Gas cutting, if any, will be allowed only in CS LP Piping.

14.41 The contractor shall ensure lowering of pipes in position with adequate precautions as to avoid any damage to either material or men. Only the anchoring points earmarked for the purpose of lowering the pipes are to be used.

14.42 It is possible that a few flanges may not be matching. The contractor shall be required to cut and re-weld the same as and when required without any additional cost.

14.43 Wherever piping erected by the contractor is connected to equipment/ piping erected by the other agencies the joint at the connecting point shall be the responsibility of the contractor who is erecting the piping under this specifications.

14.44 Normally the high pressure valves will have prepared edges for welding. But, if it becomes necessary, the contractor will prepare new edges or recondition the edges by grinding or chamfering to match the corresponding tubes and pipes within the scope of work.

14.45 All fitting like 'T'- pieces, weld neck flanges, reducers, etc shall be suitably matched with pipes for welding. The valves will have to be checked, cleaned or overhauled in full or in part before erection and during commissioning.

14.46 The contractor shall be responsible for correct orientation of all valves so that seats, stems and hand wheels will be in desired location. It is the responsibility of the contractor to obtain the information regarding orientation of valves not fully located on drawings before the same are installed.

14.47 Suspension for piping, etc., will be supplied in running lengths, which shall be cut to suitable sizes and adjusted as required.

14.48 The adjustment of all hangers & supports erected in both cold & hot conditions for maintaining the proper slopes towards the drain pots and application of cold pull in the piping wherever required is also included in the scope of the contractor.

14.49 Spring suspensions/ constant load hangers have to be pre-assembles for required load and erection carried out as per instruction of BHEL. Any adjustments, removal of temporary arrests/ locks etc. have to be carried out as and when required.

14.50 Contractor shall install piping in such a way that no excessive or destructive expansion forces exists in either the cold condition or under conditions of maximum temperature and pressure. All bends, expansion joints and any other special fittings necessary to take care of proper expansion shall be incorporated as per the advice of Engineer. During installation of expansion joints, anchors, care must be taken to see full design movement is available at all times from maximum and minimum temperature.

14.51 The hanger assemblies shall not be used for attachment for rigging to hoist the pipes into position. Other means shall be used to securely hold the pipe in position till pipe supports are completely assembled and attached to the pipe and building structure.

14.52 Layout of small bore piping, oil systems etc. as required 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 pipelines even after completion of erection or jointing of extension spindle for valves to suit the site conditions and operational facility shall be part of erection work within the quoted rates.

14.53 All valves, including motorized valves, flap valves, dampers, actuators etc. shall be serviced and lubricated to the satisfaction of Engineer before erecting the same and during pre- commissioning also. Welding of jointing of extension spindle for valves to suit the site conditions and operational facility shall be part of erection work within the quoted rates.

14.54 Erection and welding of necessary instrumentation tapping points, thermocouple pads, thermos-wells, valves, battery of first root valves, condensing vessels, flow nozzles and control valves to be provided on, auxiliaries and pipe lines are covered within the scope of this specification. This will be responsibility of the contractor and will be done as per instructions of BHEL engineer.

The welding of all the above items will be contractor's responsibility even if the:

a) Product groups, under which these items are released, are not covered in the scope of this tender
b) Items are supplied by any agency other than BHEL.

14.55 The contractor shall carry the tightening of the field bolts on the equipment and piping covered under this specification by using either the calibrated torque wrench method or

the turn of part method. The methods used the tools and the equipment deployed shall be subject to the approval of Engineer. The competent technicians shall carry out the bolting work.

14.56 The contractor shall prepare as built piping drawings & submit to BHEL Engineer for approval & verification of material used.

14.57 Contractor has to make canopies for motors, actuators, lube oil units, control valves etc. Material for this will be free issued by BHEL in random lengths/ sizes. No separate payment for fabrication is envisaged. Only the erection tonnage rate applicable for structure **Item Sl. No 1 of rate schedule** will be paid for this work.

14.58 The contractor shall erect scaffoldings/ temporary platforms supports etc required during erection before the permanent supports are erected. These should be of adequate capacity and shall never be overloaded. These should be replaced when not found suitable during erection work. All structure materials required for the above shall be arranged by the contractor at his own cost. No such material shall be columns shall be avoided. In case of absolute necessity, contractor shall take prior approval from BHEL Engineer. Further, any cutting or alteration of member of the structure or platform or other equipment shall not be done without specific prior approval of BHEL Engineer.

14.59 Tanks shall be supplied by the units in more than one segment (rolled sections) having height of segment approx. 2500mm. Contractor have to complete the assembly at site with necessary welding/NDT/testing as per the approved FQP. Rubber lining of the tanks shall be in the scope of the rubber lining vendor.

14.60 Lime stone silos shall be supplied by the units in more than one segment (3 to 4 segment) and height of segment shall be 2500mm. Contractor shall have to complete the assembly, final welding/ NDT/ testing as per the approved drawings/ documents/ FQP.

14.61 Contractor has to arrange required fire proof tarpaulins to protect the machined components / assembled parts drawn from BHEL before and after erection at their cost.

14.62 Erection & dismantling of air blowers and connecting pipes & ducts, providing blanks/ dummies at the required locations and conducting gas-tightness test is in the scope contract and shall be carried out within the quoted rate.

14.63 Certain extra lengths of various tubes/pipes are provided as erection allowance and the same have to be cut/ adjusted to suit the site conditions and layouts or certain small lengths may have to be added for adjustments to suit the site conditions. For any

mismatch while matching the joints in tubes, the cutting, adjusting, re welding, addition spool pieces should be done by the contractor to match site conditions without any extra payment.

14.64 Normally supports are issued in running meters. Any additional supports as called for by BHEL Engineer shall be fabricated by the contractor and provided at no extra cost. However, the raw material required for fabrication of such supports shall be supplied by BHEL free of cost.

14.65 D.S.L / equivalent system for hoisting equipments are also to be erected and commissioned including load testing by the contractor within the quoted rates. Required manpower including electricians are to be arranged by the contractor for carrying out commissioning of electrical hoist and load testing of the above electrical hoist. Required loads will be provided by BHEL free of cost.

14.66 Prior to erection of any components inspection to be done for any foreign materials and damages and they are to be removed / attended as per BHEL engineer.

14.67 For skid mounted equipment, the checking and re-alignment required at site is in the scope of work.

14.68 Additional platforms of permanent nature for approaching different equipments, as per site requirement which may not be indicated in drawings shall be fabricated and installed by the contractor. However the contractor will be paid for this work on accepted tonnage rate for erection. The material required for platform will be supplied by BHEL free of cost.

14.69 **Field Quality Assurance Formats: -** It is the responsibility of the contractor to collect and fill up the relevant FQA log sheets of BHEL and present the same to BHEL after carrying out the necessary checks as per the log sheets and obtaining the signature of BHEL and customer as token of their acceptance. Payment to the contractor will be linked with the submission of these FQA log sheets.

14.70 All tests required as per **FQP** (**Field Quality Plan**) will be in Bidder's scope. FQP shall be provided during execution time.

14.71 Any fixtures, lifting arrangement for columns, etc, scaffolding materials, approach ladder, concrete block supports, steel structures required for temporary supporting, pre-assembly or checking, welding, lifting and handling during pre-assembly and erection shall be arranged by contractor at his cost. Any such materials, if supplied by manufacturing unit will be issued free of cost by BHEL.

14.72 Contractor shall erect scaffolding/ temporary platforms for erection. These should be of adequate capacity and shall never be over loaded. These should be replaced when not found suitable during erection work and dismantled on work completion and removed from such site.

14.73 It shall be the responsibility of the contractor to provide ladders on columns for initial work till such a time stairways are completed. For this, the ladder should not be welded on the column and should be pre-fabricated clamping type ladders. No temporary welding on any structural member is permitted except under special circumstances with the approval of BHEL. In case it is absolutely necessary then the contractor shall cut the temporary structure and rectify the column as directed by the engineer.

14.74 Contractor is strictly prohibited in using the FGD/ Auxiliary Components for any temporary supporting or scaffolding works etc. In case of such misuse a sum of determined by Engineer will be recovered from the contractor's bills.

14.75 In the case of structural members / ducts, in certain cases, the raw material will be supplied in random lengths and the contractor will have to make up the length/prepared the edges to suit the matching profile weld/bolt connect the joints at no extra cost.

14.76 Normally, the matching profile will be cut out for the structural members but the contractor will have to carry out suitable alterations / adjustments at site, without any extra payment, in case it becomes necessary.

14.77 The contractor shall take all reasonable care to protect the materials and equipment during erection. Touch up painting required to be done on any equipment or part during the course of erection will have to be done by the contractor.

14.78 Contractor shall carryout necessary touch up painting periodic application of preservation on all components and other equipment during erection / after erection until completion of work. Contractor shall provide necessary crew with all items like wire brushes, paint brushes, emery paper, cotton waste, scaffolding materials etc.

14.79 It is the responsibility of the contractor to do the alignment, checking, etc. if necessary, repeatedly to satisfy BHEL Engineer / Customer Engineers with all the necessary tools and tackles, manpower etc. without any extra cost. The alignment will be completed only when jointly certified so, by the BHEL Engineer & Customer. Also the contractor should ensure that the alignment is not disturbed afterwards.

14.80 Works such as minor rectification of foundation bolts, reaming of holes, drilling of dowels, matching of bolts and nuts, making new dowel pin etc. are covered in the scope of work.

14.81 Contractor shall engage separate gangs throughout the contract period, exclusively for proper housekeeping of the site. The contractor has to make necessary arrangements for collection and for bringing down the scrap from various locations as indicated by BHEL Engineer. The housekeeping must be a routine and continuous activity in the various work fronts. If the contractor does not do this job satisfactorily, BHEL will arrange for the same at the cost of the contractor. Periodical payments to the contractor for the work done will be considered only if the housekeeping is certified as satisfactory by the customer.

14.82 It is the responsibility of the contractor to engage his workmen in shifts or on overtime basis for achieving the desired progress and target set by BHEL. The contractor‘s quoted rate shall include all these contingencies.

14.83 All the valves, lifting equipments, etc. shall be serviced and lubricated to the satisfaction of BHEL Engineer before erecting the same and also during pre-commissioning. The bearings shall be properly cleaned, serviced and lubricated before commissioning at no extra cost. Even after commissioning the equipments, if there are problems in the operation they have be attended to by the contractor during the tenure of the contract. Welding or joining of extension spindle for valves to suit the site conditions and operational facility shall be part of erection work within the quoted rate.

14.84 All hangers, supports and anchors (including concreting or welding) shall be installed as per drawing to obtain are reliable and complete installation as per instructions of BHEL Engineer. Normally supports are issued in running meters. Any additional supports as called for by BHEL Engineer shall be fabricated by the contractor and provided at no extra cost. However, the raw material required for fabrication of such supports shall be supplied by BHEL free of cost. (Any machining or threading is involved will only be done by BHEL).

14.85 Before lifting the heavy components, soft materials like gunny bags to be used while lashing the rope to avoid dents, rubbing marks etc. The capacity, number of sheave pulleys, size of the rope, guide pulley locations are to be decided at site with respect to the capacity and positioning of the winch. The end caps provided at shop for various stubs are to be removed during final fit up only.

14.86 Ducts/ expansion pieces are dispatched to site in loose walls/ plates and these are to be assembled at site before erection.

14.87 Non specified jobs at the interface/ terminal points like bolting welding, gasket changing etc have to be done by the contractor within the quoted price.

14.88 Instrument tapping coming wherever to be welded/ fitted by the contractor within the quoted price.

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

14.90 Certain instruments like pressure gauges, pressure transmitters, temperature gauges, flow switches and indicators, etc. are received in assembled condition as integral part of equipment. Contractor shall be responsible for safe receipt, installation and custody of these instruments supplied mounted on skids/ equipment. The calibration of skid/ equipment mounted instruments shall be arranged by BHEL through other agency engaged for C&I. Contractor will be informed by BHEL engineer about details of C&I agency. The contractor shall coordinate with the C&I agency for removal, calibration and re-installation of the instruments. Though C&I agency will remove and reinstall the instruments after calibration, the contractor for this package will maintain the list of all instruments removed and reinstalled. Instruments prior to removal and after reinstallation shall be considered in custody of the contractor for this package. All instruments such as pressure gauges/ temperature gauges, switches etc. forming part of product group (PG) are under the erection scope of this contract and shall be installed and commissioned by the contractor of this package at no extra cost to BHEL. However, the calibration of these instruments shall be done by C&I agency as above.

14.91 All electrical panels, control gears, and such other devices shall be properly dried by heating to improve IR valve before they are energized. Exposed parts shall be protected against moisture ingress and corrosion during storage and periodically inspected.

14.92 The contractor shall completely erect and test all the piping systems, covered in the specification including sampling lines up to and including sample coolers, hangers & supports, valves and accessories in accordance with the drawings furnished. This includes all necessary bolting, welding, pre-heating, stress relieving, testing cleaning and painting. System shall be demonstrated in condition to operate continuously in a manner acceptable to the Engineer. Welding shall be used throughout for joining pipes except where flanges, screwed or other type joints are specified or sown on the drawings. All piping shall be erected true to the lines and elevation as indicated in the drawings.

14.93 It is possible that a few flanges may not be matching. The contractor shall be required to cut/ re-weld the same as and when required without any additional cost.

14.94 Statutory Approval

It shall be the responsibility of the Contractor to obtain the all necessary approvals/permits from the inspection/regulatory authorities etc. on behalf of the Employer, as may be required for design/calculations, manufacturing and erection procedure, testing etc. As called for under the statutes, regulations and the safety codes. All such documentation required to be submitted to the statutory authorities shall be submitted to the Employer for its review.

15.0 **WELDING, HEAT TREATMENT, RADIOGRAPHY AND NDT**
(All the works mentioned hereunder shall be carried out within the accepted rate unless otherwise specified)

15.1 **Special care regarding surface, profile, joint and edge preparation** is to be taken care by Contractor, in FGD and associated auxiliaries, during and after welding process. For the same following **European Quality Standards are to be followed** without any fail:

a. **EN 14879-1:2005: E**
b. **EN 14879-3:2006: E**
c. **EN 14879-4:2007 (E)**

15.2 All welders shall be tested and approved by BHEL Engineer before they are actually engaged on work even though they may possess a valid certificate. BHEL reserves the right to reject any welder if the welder's performance is not found to be satisfactory. The contractor shall maintain the records of qualification of welders. BHEL Engineer will issue all the welders qualified for the work, an identity card. The welder will keep the same with him at work place at all times. He may be stopped from work if he is not found in possession of the same.

15.3 Engineer may stop any welder from the work if his performance is unsatisfactory for any reason or if there is a high percentage of rejection in the joints welded by him. The welder having passed qualification tests does not absolve the contractor of contractual obligation to continuously check the welder's performance.

15.4 Faulty welds caused by the poor workmanship shall be cut and re-welded at the contractor’s expense. The Engineer, prior to any repair being made, shall approve the procedure for the repair of defective welds. After the repair has been carried out, the compliance shall be submitted to the engineer.

15.5 All expenses for testing of contractor's welders including destructive and nondestructive tests conducted by BHEL at site or at laboratory shall have to be borne by the contractor only. Limited quantity of raw material required for making test pieces will be supplied by BHEL free of cost.

15.6 The regulators used on welding machines shall be calibrated before putting these into use for work. The Contractor at his cost shall also arrange periodic calibration for the same.

15.7 **Only BHEL/ CUSTOMER approved electrodes and filler wire are to be arranged and used by the contractor, within the finally quoted price. BHEL/ CUSTOMER reserve the right to test from the certified lab of approved electrode being used by the contractor.** Testing charges for the same shall be borne by the contractor. All electrodes shall be baked and dried in the electric electrode-drying oven to the required temperature for the

period specified by the Engineer before these are used in erection work. All welders shall have electrodes drying portable oven at the work spot. The electrodes brought to the site will have valid manufacturing test certificate. The test certificate should have a co-relation with the lot number/ batch number given on electrode packets. No electrodes will be used in the absence of above requirement. The thermostat and thermometer of electrode drying oven will be also calibrated and test certificate from Govt. approved/ accredited test house traceable to National/ International standards will be submitted to BHEL before putting the oven in use. The contractor shall also arrange periodical calibration for the same.

15.8 The contractor shall maintain a record in the form as prescribed by BHEL of all operations carried out on each weld. He has to maintain a record indicating the number of welds, the names of welders who welded the same, date and time of start and completion, preheat temperature, radiographic results, rejection if any, percentage of rejection etc. and submit copies of the same to the BHEL Engineer as required. Interpretation of the BHEL Engineer regarding acceptability or other wise of the welds shall be final.

15.9 The contractor shall carry out the edge preparation of weld joints at site in accordance with the details acceptable to BHEL Engineer. Wherever possible machining or automatic flame cutting should be done. Gas cutting will be allowed only wherever edge preparation otherwise is impractical. All slag / burrs shall be removed from the edge and all the hand cuts shall be ground smooth to the satisfaction of engineer.

15.10 All welds shall be painted with anticorrosive red oxide paint once radiography and stress reliving works are over. Necessary consumables and scaffolding etc including paints shall be provided by contractor at his own cost.

15.11 Pre-heating, radiography, UT and other NDT tests, post heating and stress relieving after welding of tubes, pipes, including attachment welding wherever necessary, are part of erection work and shall be carried out by the contractor in accordance with the instructions of the Engineer. Contractor at his cost shall arrange all equipment and consumables essential for carrying out the above process.

15.12 The contractor shall also be equipped for carrying out other NDT like LPI / MPI/UT / Hardness test etc. as required as per welding schedules / drawings within the finally accepted price / rates. For UT machine shall be used of recordable type.

15.13 The technical particulars, specification and other general details for radiography work shall be in accordance with ASME or ISO as specified by BHEL.

15.14 Contractor for radiography work shall use iridium-192. The geometric un-sharpness shall not exceed 1.5 mm. The contractor should take adequate safety precautions while

carrying out radiography. Contractor at his cost shall arrange necessary safe guards required for radiography (including personnel from BARC).

15.15 Low speed high contrasts, fine grain films (D-7 or equivalent) in 10 cm width only be used for weld joint radiography. Film density shall be between 1.5 to 2.0.

15.16 All radiographs shall be free from mechanical, chemical or process marks, to the extent they should not confuse the radiographic image and defect finding. Penetrameter as per ASME or ISO must be used for each exposure.

15.17 Lead numbers and letters are to be used (generally 6mm size) for identification of radiographs. Contract number, joint identification, source used, welder's identification and SFD are to be noted down on paper cover of radiograph.

15.18 Lead intensifying screens for front and back of the film should be used as per the above-referred ASME specification.

15.19 The joint is to be marked with permanent mark A, B, C to identify the segments. For this a low stress stamp shall be used to stamp the pipe on the down streamside of the weld.

15.20 For multiple exposures on pipes, an overlap of about 25-mm of film should be provided.

15.21 Radiography personnel with sufficient experience and certified by M/s BARC for conducting radiographic tests in accordance with safety rules laid down by Division of Radiological protection only have to be deployed. These personnel should also be registered with DRP / BARC for film badge service.

15.22 All arrangements for carrying out radiography work including dark room and air conditioner and other accessories shall be provided by contractor within the space allotted for office at his cost. As an alternative the contractor may deploy an agency having all above facilities and who are duly approved / accredited by BARC and / or other Regulatory authorities. Detailed particulars of such agencies will be submitted and got approved by BHEL Engineer before the actual deployment of agency for radiography work.

15.23 The contractor shall have a dark room fully equipped with radiography equipment, film (un-exposed), chemicals and any other dark room accessories.

15.24 Radiography inspection of welds shall be performed in accordance with requirement and recommendation of BHEL Engineer. The quantum of radiographic inspection shall be as per provision of ASME /BHEL/NTPC/UPRVUNL approved documents. However, minimum percentage of joints to be radiographed shall not be less than the requirement of BHEL

welding schedule / IBR / Customer's requirements. The percentage may be increased depending upon the quality of joints and at the discretion of BHEL.

15.25 Radiography on LP piping joints is not envisaged. However, other NDT test as called for in the FQP including LPI, MPI and HT will have to be carried out. Since, radioisotopes are being used, all precautions and safety rules as prescribed by BHEL/BARC/ Customer shall be strictly followed. BARC / DRP certificate to be provided before taking up the work.

15.26 The percentage of Radiography are tentative, which may be increased depending upon the quality of joints at the discretion of BHEL.

15.27 All the Radiographs shall be properly preserved and shall become the property of BHEL. They are to be reconciled with the work done, joints radio graphed and submitted to BHEL / customer.

15.28 Radiography of joints shall be so planned after welding that the same is done either on the same day or next day of the welding to assess the performance of HP welders. If the performance of welder is unsatisfactory, he is to be replaced immediately.

15.29 Wherever radiographs are not accepted, on account of bad shot, joints shall be re-radiographed and re- submitted for evaluation.

15.30 However, if the defect persists after first repair, further repair work followed with radiography shall be repeated till the joint is made acceptable. In case the joint is not repairable, the same shall be cut, re-welded and re-radiographed at contractor's cost.

15.31 If the contractor does not carry out radiography work due to non-availability of source / film / chemical / operator etc., BHEL will get the work done departmentally or through some other agency at the risk and cost of the contractor.

15.32 Radiography may be required to be carried out at any time (day and night) to ensure the continuity of progress. The contractor shall make all necessary arrangements including labour, supervisors/ Engineer required for the work as per directions of BHEL.

15.33 Check slots as per requirement BHEL/ Customer will be taken at contractor's cost.

16.0 APPLICATION OF INSULATION

(All the works mentioned hereunder shall be carried out within the accepted rate unless otherwise specified)

16.1 All attachment welding, including welding of hooks/ supports as per pitch both on equipment and piping shall be done as directed by Engineer. Attachment welding shall have to be done by certified welders. If necessary contractor may have to cut the hooks to correct length. Application of red oxide paint including supply of paint on welded portions as directed by BHEL is also included in the scope of work.

16.2 The contractor has to supply and apply heat resistant primer on welded portions before application of insulation.

16.3 The mineral wool mattresses (bonded/ un- bonded)/ LRB mattresses are received at site in standard sizes. These are to be dressed/ cut to suit site requirements by the contractor.

16.4 The number of layers/ thickness of mineral wool/ LRB mattresses for auxiliaries, pipe lines, valves and other vessels shall be as per various drawings and as directed by Engineer. For applying the mineral wool mattress, the required holding materials, if necessary by fabrication of rings/ hooks shall be fixed as directed and as per drawings and spec.

16.5 Contractor should ensure, proper finishing surface of the insulation, sheeting and cementing.

16.6 Contractor should ensure that the finished surface of the insulation works conforms to the dimensions and tolerances given in the drawings. Aesthetic finish and accuracy of work are most important.

16.7 It is the responsibility of the contractor to ensure that the insulation materials and sheet metal covering issued to him for application are well protected against loss or damage from weather conditions. Closed/ semi-closed sheds or any other arrangements required for this will by him at his cost. If any damage occurs to the material due to improper storage or due to any causes attributable to the contractor except for normal breakage or damages allowed in such cases, the cost of such damaged material shall be to the account of contractor.

16.8 Aluminum sheet cladding will be fabricated to the sizes and shapes specified in drawings. Beading, Swaging, Beveling of sheets, crowning the sheets, if necessary, will be carried out by him. Two coats of anti-corrosive black bituminous paint are to be applied on inner surfaces of the cladding. Bitumen sealing compound on the joints if necessary is included in the scope of this work. **Contractor may note that he will also supply anti-corrosive black bituminous paint & bituminous sealing compound required for above works at his**

cost. However, if any material for such purpose is received from BHEL Manufacturing Units then the same shall be issued free of cost to Contractor.

16.9 Aluminum sheet metal cladding over insulation will consists of plain/ ribbed/ corrugated sheets. The sheets will be supplied in standard sizes. Cutting them to required size, grooving, fabricating bends, boxes etc for proper covering is contractor's responsibility. Any cutting/ bending/ welding of fabricated skin casing sheets if required will also covered within the scope of this contract.

16.10 A log book shall be maintained by the contractor to obtain clearance for application of insulation. If the contractor does the work on his own accord without prior permission the area may have to be redone at his cost.

16.11 Contractor is liable for the exact accounting of the material issued to him and he shall make any unaccountable losses good. Allowed Wastage for the material issued are as below:

1. Wool/ LRB mattresses and cladding sheets	2%
2. Insulation bricks and mortar	2%
3. Castable Refactory	1%

16.12 The entire surplus, unused materials etc supplied by BHEL shall be returned to BHEL after the work is over. Materials like gunny bags and packing materials, empty containers may be returned at periodical intervals.

16.13 The contractor shall leave certain gaps and openings while doing the work as per instructions of BHEL engineer to facilitate inspection during commissioning and to fix gauges, fittings and instruments. The gaps will have to be finished as per the drawings at a later date by the contractor at his cost.

16.14 If during erection and commissioning any of the parts are to be insulated temporarily fixed and then replaced by permanent ones at a later date or if any of the parts are to be removed for modification, rectification, adjustment and then refitted or if some parts are to be opened for inspection, checking and for measurement of metal surface temperature the same may necessitate removal and re-application of insulation and sheet metal cladding, which shall be done by the contractor and the erection rate quoted shall be inclusive of such contingencies.

16.15 Removal type insulation shall be provided for valves, fittings, expansion joints, etc as per the drawing or as directed by BHEL Engineer.

16.16 All temporary pipelines required during testing, pre-commissioning and commissioning should be insulated as directed by BHEL at no extra cost to BHEL. However, required insulation material shall be issued by BHEL free of cost.

16.17 Insulation of expansion joints, dampers, etc. shall be carried out after NDT/air tightness test is completed.

16.18 Day to day cleaning of insulation debris and scraps to be ensured by the contractor. Excessive wastage will attract cost recovery.

17.0 PAINTING INCLUDING FINISH PAINTING & STENCILING

(All the works mentioned hereunder shall be carried out within the accepted rate unless otherwise specified.)

17.1 The scope of work shall also include supply and application of final painting of all the erected equipment's as required and specified as per painting schedules. Before commencement of Final Painting, the contractor has to obtain written clearance from BHEL/Customer for effective completion of surface preparation.

17.2 All exposed metal parts of the equipment, structure, auxiliaries, piping, and other items (covered within the scope of this contract) after installations are to be painted. Mostly the equipment / components installed are with one coat each of primer paint and synthetic enamel / heat resistant paint. However, due to aging, the same may have got deteriorated for peeled off. The surfaces are to be thoroughly cleaned of all dirt, rust, scales, grease, oils and other foreign materials by wire brushing, scrapping, any other method as per requirement of BHEL. The same will be inspected and approved by the engineer before painting.

17.3 Required paints, thinner, and other consumables such as wire brush, brush etc. shall have to be arranged by the contractor at their own cost. The required manpower, other required consumables, T & P etc. shall be provided by the contractor with in the quoted rate. The arrangement of primer/paint for final painting will be in contractor's scope.

17.4 After applying the primer paints all structure/ equipment/ items, shall be finish painted with two coats of alloyed resin machinery enamel paints as specified by BHEL engineer. In case proper finish is not obtained in two coats, the contractor shall apply additional coat(s) till proper finish is achieved. Before applying the subsequent coats the thickness of each coat shall be measured and recorded with BHEL / Customer. After completion of painting all bright spots shall be cleaned to the satisfaction of Engineer.

17.5 Certain equipment like control panels, valves etc. shall require spray painting. The contractor shall make arrangements of the required equipment for spray painting. Spray painting at the job site shall be permitted only at times and locations approved by Engineer.

17.6 Contractor at no extra cost to BHEL shall supply all paints, primers, tools and other consumables including scaffolding materials required for finish painting. Paint is to be BHEL/Customer approved make only and painting should be as per colour scheme and quality approved / specified by Engineer. Valid Test Certificate for the paint so supplied shall be made available before use of the same on work. No paint whose shelf life has expired should be used for painting.

17.7 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.
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.
(**Painting procedure to be followed also for touch-up painting on damaged areas**).

17.8 Each coat (Primer, intermediate, finish) shall have a minimum thickness of dry film thickness (DFT) in microns and the DFT of finish paint shall not be less than the specified. Necessary instrument for measuring the thickness of paint applied is to be arranged by the contractor.

17.9 The contractor may be required to fill up dents / marks by applying putty before final painting of equipment. All materials and arrangements have to be made within quoted lump sum price/rates.

17.10 The contractor shall provide legends with direction of flow on equipment and piping in size specified by Engineer. Letter writing shall be done in Hindi / English or in both languages.

17.11 The painters have to undergo test on a mock plate of size 1m*1m and only qualified painters will be allowed to work.

17.12 The contractor shall ensure availability of

- Ford Cup-4 to measure consistency of paint,
- Automatic magnetic gauge/Elcometer to measure the dry film thickness and
- SSPC Visual standards to assess degree of cleanliness of surfaces to be painted.

17.13 All paints should be stored in well-ventilated store. The painters and other personnel deployed should use proper protective equipment to avoid inhalation of fumes.

18.0 TESTING , PRE-COMMISSIONING & COMMISSIONING AND POST COMMISSIONING

(All the works mentioned hereunder shall be carried out within the accepted rate unless otherwise specified)

18.1 Contactor shall carry out all the required tests and pre-commissioning and commissioning activities required for their successful and reliable operation of FGD system. These would include Air/ Gas tightness test of ducts, Hydraulic test of piping, Water fill test/ vacuum box test of tanks, trial run of pumps/ blowers/ ball mills/ feeders/ vacuum belt filter/ hydro cyclones, etc. as instructed by BHEL using contractors own consumables, labour and scaffoldings etc. Specific omission of any test which is required for the successfully commissioning all the equipment's covered under scope does not absolve the contractor of its responsibilities of performing of that test.

18.2 All required tests (Mechanical and electrical) indicated by BHEL and their clients for successful commissioning are included in the scope of these specifications. HT and LT electrical testing of motors and megger/IR value checking is also part of scope. These tests/ activities may not have been listed in these specifications.

18.3 The 'initial operation'/ trial operation of the complete facility as an integral Unit shall be conducted for 720 hours. During the period of initial operation of 720 hours, the FGD system shall operate continuously at full load for a period not less than 72hours. The initial operation shall be considered successful, provided that each item/ part of the facility can operate continuously at the specified operating characteristics, for the period of Initial operation with all operating parameters within the specified limits and at or near the predicted performance of the equipment/ facility.

18.4 After completion of erection of ducts, the contractor shall conduct the air/gas tightness of the inlet duct from ID fan outlet to booster fan to absorber inlet and outlet duct from absorber outlet up to wet stack chimney. Erection etc. of blowers and blanks and putty required for conducting air tightness test shall be carried out as part of work (putty to be procured by the contractor without any extra cost of work)

18.5 All the tests may have to be repeated till all the equipment satisfy the requirement /obligation of BHEL at various stages. The contractor shall do all the repairs for site-welded joints arising out of the failure during testing.

18.6 Scope of pre-commissioning activities cover installation of all necessary equipment including temporary piping, supports, valves, blanking, with accessories with access platforms valves, pressure gauges, electrical cables, switches, cutting of some existing valve, or for any other tests as the case may be and will carry out above activities under this scope of work as per instruction of BHEL Engineer. The scope also covers the offsite

disposal of effluents of the tests under the scope of this contract as per instruction of BHEL Engineer.

18.7 All items / material required for conducting hydraulic test, alkali boil out, acid cleaning/EDTA cleaning steam blowing, pre commissioning test and commissioning etc., will be supplied by BHEL / its customer. However, installation, servicing, dismantling after commissioning and returning of the same to stores is the responsibility of the contractor who is erecting the equipment. The contractor may note that no separate payment shall be released for any temporary works that are to be carried out for conducting pre-commissioning and commissioning tests. Bidders are advised to include expenses on temporary works along with the rates being quoted by them. Broadly the work on temporary systems will be as under:

- Erection etc. of blowers and blanks and putty, temporary fixtures & ducts required for conducting air leak test are to be installed. (Putty to be procured by the contractor).
- Dismantling of the temporary equipment etc. and return the same to the BHEL stores is also included in the scope of work.

The above is only a broad breakup of the temporary works. The engineer at site will make final break up. His decision will be final and binding by all the parties.

18.8 Contractor shall lay all necessary electric cables and switches etc. required for the air leak test, other tests etc., and maintain the system till the tests are completed satisfactorily.

18.9 It shall be the responsibility of the contractor to provide various category of workers in sufficient numbers along with Supervisors during pre-commissioning, commissioning and post commissioning of equipment and attending any problem in the equipment erected by the contractor till handing over. Contractor will provide necessary consumables, Certified T&P's, IMTE's etc., and any other assistance required during this period. Association of BHEL's / Client's staff during above period will not absolve contractor from above responsibilities.

18.10 It shall be specifically noted that the above employees of the contractor may have to work round the clock along with BHEL Engineers and hence overtime payment by the contractor to his employees may be involved. The contractors finally accepted rates should be inclusive of all these factors also.

18.11 In case, any rework is required because of contractor's faulty erection, which is noticed during pre-commissioning and commissioning, the same has to be rectified by the contractor at his cost. If any equipment / part is required to be inspected during pre-

commissioning and commissioning, the contractor will dismantle / open up the equipment / part and reassemble / redo the work without any extra claim.

18.12 During commissioning, opening / closing of valves, changing of gaskets, realignment of rotating and other equipment, attending to leakage and adjustments of erected equipment may arise. The finally accepted price / rates shall also include all such work.

18.13 The contractor shall make all necessary arrangements including making of temporary closures on piping/ equipment for carrying out the hydrostatic testing on all piping equipment covered in the specification at no extra cost.

18.14 The valves will have to be checked, cleaned or overhauled in full or in part before erection, during pre-commissioning and commissioning as may be necessary.

18.15 In case any defect is noticed during tests, trial runs and commissioning such as loose components, undue noise or vibration, strain on connected equipment etc., the contractor shall immediately attend to these defects and take necessary corrective measures. If any readjustment and realignment are necessary, the contractor at his cost shall do the same as per Engineer's instructions including repair, rectification and replacement work. The parts to be replaced shall be provided by BHEL.

18.16 All temporary supports shall be removed in such ways that pipe supports are not subjected to any sudden load. During hydraulic testing of the pipes, all piping having variable spring type supports shall be held securely in place by temporary means while constant spring type support hangers shall be pinned or blocked solid during the test.

18.17 The contractor shall carry out cleaning and servicing of valves and valve actuators prior to pre-commissioning tests and / or trial operations of the plant. A system for recording of such servicing operations shall be developed and maintained in a manner acceptable to BHEL Engineer to ensure that no valves and valve actuators are left unserviced. Wherever necessary as required by BHEL Engineer, the contractor shall arrange to lap / grind valve seats. Cleaning and servicing of all the filters / strainers, toppings of oils coming in the system shall be done by the contractor within the accepted price.

18.18 Necessary technical support during commissioning of the equipments shall be provided by BHEL.

18.19 At the time of each inspection, the contractor shall take note of the decisions / changes proposed by the Engineer and incorporate the same at no additional cost. The contractor shall carry out any other test as desired by BHEL Engineer/ Manufacturer on erected

equipment covered under scope of this contract during testing and commissioning to demonstrate the physical completion of any part or parts of the work performed by the contractor.

18.20 Scope of pre-commissioning, commissioning and post commissioning activities cover installation of all necessary temporary piping, supports, valves, blanking, pumps, tanks etc. and other accessories with access platforms valves, pressure gauges, electric cables, switches, cutting of some of existing valve, placing of rubber wedges in the valves etc., required for hydro test, or for any other tests as the case may be and will carry out above activities under this scope of work as per instructions of BHEL. The scope also covers the offsite disposal of effluents.

18.21 Any temporary fasteners, gaskets etc, if required to be provided for commissioning of the system, are under the scope of this contract within the quoted rates.

18.22 It shall be the responsibility of the contractor to preserve the cleaned surface as per BHEL's requirement.

18.23 The contractor shall make all necessary arrangements including making of temporary closures on piping/ equipment for carrying out the hydrostatic testing on all piping equipment covered in the specification a no additional cost. The contractor shall carryout the required test on the pipelines such as Hydraulic test of various piping system, Ultrasonic Test for weld defects and finding thickness, Dye Penetration test, Magnetic particles test for weld defects and material defects etc. All facilities (manpower, materials, equipment, consumables etc) including proper approaches wherever required for these tests shall be arranged by the contractor along with qualified technician within finally accepted rates.

18.24 In certain places blanking has to be resorted prior to Hydraulic test and spool pieces have to be erected in place of control valve, orifices and other fittings and these spool pieces have to be subsequently replaced with the regular valves/ fittings by the contractor at no extra cost.

18.25 All required tests (Mechanical and electrical) indicated by BHEL and their clients for successful commissioning are included in the scope of these specifications. These tests/ activities may not have been listed in these specifications.

18.26 Valves will have to be checked, cleaned or overhauled in full or in part before erection, alkali flushing, steam blowing and during commissioning as may be necessary.

18.27 During this period though the BHEL's/ client's staff will also be associated in the work, the contractor's responsibility will be to arrange for the complete requirement of supervision, consumables, labour, T&P and IMTEs required till such time the commissioned units are taken over by the BHEL's customer.

18.28 It is possible that due to any reason the final supporting may not be completed before conducting Hydraulic Test. The contractor may have to strengthen or install any additional supports as per instruction of BHEL. This work is a part of the work and no additional payment shall be made on this account.

18.29 All the shafts of the equipment shall have to be properly aligned to that of matching equipment to perfection, accuracy as required and the equipment shall be free from excessive vibration s as to avoid over-heating of bearings or other conditions, which may tend to shorten the life of the equipment. All bearings, shafts and other rotating parts shall be thoroughly cleaned and lubricated as per recommendations of BHEL engineer.

18.30 Contractor to provide necessary commissioning assistance from pre-commissioning state onwards and up to continuous operation of the Unit & handing over to customer. The category of personnel to be as per site requirement and to meet the various pre-commissioning and commissioning programs made to achieve the schedule agreed with customer.

18.31 After synchronization, the commissioning activities will continue. It shall be the responsibility of the contractor to provide manpower including necessary consumables, hand tools and supervision as part commissioning assistance for a period of six months after synchronization or till handing over of sets to customer, whichever is earlier.

18.32 Commissioning of the FGD & Aux will involve trial runs of all the equipments erected. Contractor shall provide required workers along with supervisors with all the requisite tools round the clock and material for all these works, which shall form part of the work to be done.

18.33 During commissioning any improvement or rectification due to design requirement is involved and if the contractor is asked to carry out the job, they shall be paid at man-day rates as per GCC clause no. 2.15. For this purpose, daily labour report indicating therein nature of work carried out, consumables used, etc. shall be maintained by contractor, and got signed by BHEL Engineer every day. It is not obligatory on the part of BHEL to get the works done by the contractor. They can employ any other agency if they so desire at that time.

18.34 During commissioning changing of gaskets, tightening of bolts, realigning of rotating and other equipment, attending to leakage and minor adjustments erected equipment may arise. The quoted rate of the contractor shall be inclusive of all such works.

18.35 During commissioning any improvement / repair / rework / rectification / fabrication / modification due to design improvement / requirement is involved, the same shall be carried out by the contractor promptly and expeditiously.

18.36 Lubricating oil units of the rotating machines are to be cleaned thoroughly before pouring of final lubricating oil. Topping up of lubricants during running of the set till handing over to be done by the vendor. Required lubricants both for the first filling and topping up are to be supplied by BHEL free of cost. The empty containers of the lubricating oils should be returned to BHEL free of cost. The empty containers of the lubricating oils should be returned to BHEL stores/ place indicated by BHEL from time to time.

18.37 The contractor has to provide required man power assistance during pre-commissioning and commissioning checks of motor operated valves, actuators, control valves etc. without any extra charges.

18.38 The instruction of motor manufacturer regarding storage of the motors and re conservation must be strictly followed without any deviation.

18.39 Attending punch points post commissioning and resolve the deficiency for handing over the Unit to customer.

18.40 All oils and greases to be filled in the main equipment's as first fill and subsequent topping up's will be furnished by BHEL. All services including labor and T&P will be provided by the contractor for transporting from BHEL/ customer stores handling, filling, emptying, refilling etc. The consumption of lubricants/chemicals shall be properly accounted for. Surplus material if any shall be properly stacked/tagged and returned to BHEL/Customer stores at no extra cost to BHEL. BHEL reserves the right to recover costs for wastage by the contractor.

18.41 For conducting gas tightness test, it may be required to erect the blowers and connecting ducts and commission the same for tightness test. It is the responsibility of the contractor to erect the blowers & dismantle once the test is over. Contractor shall carry out the work within the quoted rate and BHEL will provide required temporary pipes / ducts, blowers and dummies free of cost for conducting the test.

18.42 The commissioning activities and trial operations will continue till handing over of the unit. It shall be the responsibility of the contractor to provide various categories of workers in sufficient numbers as per the work requirement along with supervisors including necessary consumable tools etc., during this period. The rate quoted shall indicate all these contingencies also. The various categories of workers required for pre-commissioning, commissioning and post-commissioning activities are as follows:

a) Fitters
b) Structural welders
c) Riggers
d) Unskilled workers
e) Supervisors
f) Electricians
g) Laggers
h) Sheet metal fabricator/fitter
i) Any other category of workers as may be required.

Further in addition to the above, contractor has to arrange the following minimum manpower exclusively for assisting BHEL commissioning engineers during stabilization and trial operation period. This manpower will be directly controlled by BHEL commissioning engineers.

1. One Supervisor in charge per shift for three shifts.
2. Two Fitters per shift for three shifts.
3. Four Helpers per shift for three shifts.
4. One Electrician per shift for three shifts.

18.43 The completion criteria shall be that as given in the commissioning procedure, and shall be done up to the satisfaction of BHEL Engineer.

UNPRICED RATE SCHEDULE

ITEM NO.	DESCRIPTION OF WORK	TOTAL VALUE "A" IN INR (IN FIGURES AND WORDS)
1.0	TOTAL PRICE FOR THE TOTAL WORK OF "ERECTION, TESTING, COMMISSIONING, TRIAL OPERATION, HANDING OVER AND FINAL PAINTING OF FGD & AUXILIARIES" AS PER TENDER SPECIFICATIONS AT 1X660MW PANKI TPS, PANKI, KANPUR.	
Notes:		
1.	The rates of individual item for the entire scope of work as define in BOQ Chapter X shall be arrived as per Calculation defined in Annexure-B.	
2.	The derived item rate will remain firm throughout the contract period	

Annexure-B

Calculation ratio for different items based upon the total value as per rate schedule

Sl. No	DESCRIPTION OF WORK	Qty. (in MT)	FACTOR (F)	Rate per MT (INR)= [(F)*(A)] 1,00,000	Amount (INR)= Rate per MT x Qty
1.	Erection, testing, commissioning, trial operation and handing over of **Structures, etc** as per tender specifications **(As per Annexure- A)**	3,505.11	15.86384518		
2.	Erection, testing, commissioning, trial operation and handing over of **Tanks, etc** as per tender specifications **(As per Annexure- A)**	463.05	19.97626629		
3.	Erection, testing, commissioning, trial operation and handing over of **Piping and accessories, etc** as per tender specifications **(As per Annexure- A)**	286	29.53334273		
4.	Erection, testing, commissioning, trial operation and handing over of **Rotating Machines, etc** as per tender specifications **(As per Annexure- A)**	554.81	9.886767398		

Sl. No	DESCRIPTION OF WORK	Qty. (in MT)	FACTOR (F)	Rate per MT (INR)= [(F)*(A)] 1,00,000	Amount (INR)= Rate per MT x Qty
5.	Erection, testing, commissioning, trial operation and handing over of **GGH System** as per tender specifications **(As per Annexure- A)**	663.5	29.37523724		
6.	Erection, testing, commissioning, trial operation and handing over of **Insulations, sheeting etc** as per tender specifications **(As per Annexure- A)**	110	13.1390399		
7.	Erection, testing, commissioning, trial operation and handing over of **SS Works** as per tender specifications **(As per Annexure- A)**	5	55.56738191		
	TOTAL AMOUNT "A" (INR)				

Notes:

i. Bidder's quoted price above shall be complete in all respect for the full scope defined in specification and in accordance with all terms & conditions of tender.

ii. Contractor shall fully understand description and specifications of items mentioned in BOQ.

iii. Conditional price bids with any deviation / clarification etc. are liable to be rejected. No cutting / erasing / over writing shall be done.

iv. Quantities mentioned in rate schedules are approximate only and liable for variation on either side depending upon site / design requirement. The tentative contract value (CV) of entire scope of work shall be calculated as per finally quoted / accepted rates & the Quantities indicated in Rate Schedule.

v. Contractor's total quoted price as per RATE SCHEDULE (ANNEXURE-B) will be taken as tentative only. The contractor undertakes to execute actual quantities as per advice of BHEL Engineer and accordingly the final contract price shall be worked out on the basis of quantities actually executed at site and payments will also be regulated for the same

vi. Taxes (GST) shall be payable extra as per relevant clauses in Technical Conditions of Contract.