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NOTICE INVITING TENDER

(Document No PS:MSX:NIT)

Bharat Heavy Electricals Limited



Ref: BHEL/NR/SCT/TANDA/ESP/1012

Date: 28/11/15

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NOTICE INVITING E-TENDER (NIT)
BIDDER TO SUBMIT OFFERS ON PORTAL
<https://bheleps.buyjunction.in>

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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.

1.0 Salient Features of NIT

SL NO	ISSUE	DESCRIPTION	
i	TENDER NUMBER	BHEL/NR/SCT/TANDA/ESP/1012	
ii	Broad Scope of job	MATERIAL MANAGEMENT AND ERECTION, TESTING, COMMISSIONING, TRIAL OPERATION & HANDING OVER OF ELECTROSTATIC PRECIPITATOR (ESP) OF UNIT NO.1 & 2 AT 2X660 MW, TANDA STPS OF NTPC, TANDA	
iii	DETAILS OF TENDER DOCUMENT		
a	Volume-IA	<i>Technical Conditions of Contract (TCC) consisting of Scope of work, Technical Specification, Drawings, Procedures, Bill of Quantities, Terms of payment, etc</i>	Applicable
b	Volume-IB	<i>Special Conditions of Contract (SCC)</i>	Applicable
c	Volume-IC	<i>General Conditions of Contract (GCC)</i>	Applicable
d	Volume-ID	<i>Forms and Procedures</i>	Applicable
e	Volume-II	<i>Price Schedule (Absolute value).</i>	Applicable
iv	Issue of Tender Documents	<ol style="list-style-type: none"> <u>Sale from BHEL PS Regional office at :</u> Start : 28/11/15 , Time :0900HRS Closes: 21/12/15 , Time :1200 HRS From BHEL website (www.bhel.com) and https://bheleps.buyjunction.in Tender documents will be available for downloading from website till due date of submission 	Applicable
v	DUE DATE & TIME OF OFFER SUBMISSION	Date : 21/12/15 , Time : 1500 HRS Place : on https://bheleps.buyjunction.in	Applicable
vi	OPENING OF TENDER	Date : 21/12/15 <i>(within 2 hours of the latest due date and time of offer submission).</i> Notes:	Applicable

		(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 on online	
vii	EMD AMOUNT	Rs 2,00,000/-	Applicable
viii	COST OF TENDER	Rs 2,000/-	NOT Applicable
ix	LAST DATE FOR SEEKING CLARIFICATION	Date:14/12/15 Along with soft version also, addressing to undersigned & to others as per contact address given below	Applicable
x	SCHEDULE OF Pre Bid Discussion (PBD)		Not applicable.
xi	INTEGRITY PACT & DETAILS OF INDEPENDENT EXTERNAL MONITOR (IEM)	Shri V.V.R Sastry, 957, 9th Main 3 Stage, 3 Block Basaveswaranagar Bangalore- 560079 Email : sastry@gmail.com	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://bheleps.buyjunction.in and not in the newspapers . Bidders to keep themselves updated with all such information	

- 2.0 The offer shall be submitted as per the instructions of tender document and as detailed in this NIT. Bidders to note specifically that all pages of tender document, including these NIT pages of this particular tender together with subsequent correspondences shall be submitted by them. **Rates/Price including discounts/rebates, if any, mentioned anywhere/in any form in the techno-commercial offer other than the Price Bid, shall not be entertained.**
- 3.0 Unless specifically stated otherwise, bidder shall remit cost of tender and courier charges if applicable, in the form of Demand Draft drawn in favour of Bharat Heavy Electricals Ltd, payable at Power Sector Regional HQ at 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.
- 4.0 Unless specifically stated otherwise, bidder shall deposit EMD through Demand Draft/Pay Order in favour of Bharat Heavy Electricals Ltd, payable at Noida. As this tender is an E-Tender and no paper bids will be accepted therefore the scanned copy of the Demand Draft/Pay Order should be uploaded in the E procurement portal. Hard Copy of the Demand Draft/Pay Order should reach BHEL PSNR HQ Noida before the due date and time of bid submission. BHEL shall not be responsible for postal or any other delays in this regard. For other details and for 'One Time EMD' please refer General Conditions of Contract.

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

Documents Comprising the e-Tender

The tender shall be submitted online ONLY EXCEPT Tender Cost and 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. Earnest money Deposit (EMD) furnished in accordance with NIT Clause 4.0. Alternatively, documentary evidence for claiming exemption as per clause 29 of NIT.
- ii. Technical Bid (without indicating any prices).

b. Price Bid:

- i. Prices are to be quoted in the attached Price Bid format online on e-tender portal.
- ii. The price should be quoted for the accounting unit indicated in the e-tender document.
- iii. Note: It is the responsibility of tenderer to go through the Tender document to ensure furnishing all required documents in addition to above, if any. Any deviation would result in REJECTION of tender and would not be considered at a later stage at any cost by BHEL.
- iv. A person signing (manually or digitally) the tender form or any documents forming part of the contract on behalf of another shall be deemed to warrantee that he has authority to bind such other persons and if, on enquiry, it appears that the persons so signing had no authority to do so, the purchaser may, without prejudice to other civil and criminal remedies, cancel the contract and hold the signatory liable for all cost and damages.
- v. A tender, which does not fulfil any of the above requirements and/or gives evasive information/reply against any such requirement, shall be liable to be ignored and rejected.
- 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).

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 M Junction services Limited, Kolkata

Godrej Water Side, 3rd Floor, Tower-1, Plot-V, Block - DP
Sector - V, Salt Lake, Kolkata-700091, West Bengal, INDIA
The contact details of the service provider are given below:

- 1) First level: MJ Helpdesk : 033-66011717, eps.customercare@mjunction.in

- 2) Second Level: Bhaskar Chakraborty: 8584008205, bhaskar.chakraborty@mjunction.in,
Santosh Kumar: 9717149600, santosh.kumar@mjunction.in
- 3) Third Level: Rimi Ghosh: 9650044156, rimi.ghosh@mjunction.in
1. Customer care Help Desk of M/s MJUNCTION SERVICES LIMITED, Kolkata:
Tel ~ 033 - 66011717 (From 9.30 am to 5.30 pm),
Mob - 91633 48283 - 86/ 85840 08116 (From 5.30 pm to 8.30 pm)
HELPDESK email: eps.customercare@mjunction.in,
The process of utilizing e-procurement necessitates usage of **DSC (Digital Signature Certificate) (Class 3- SHA2- 2048 BIT- SIGNING & ENCRYPTION)** and you are requested to procure the same immediately, if not presently available with you. Please note that only with DSC, you will be able to login the e-procurement secured site and take part in the tendering process.

2. 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 www.bheleps.buyjunction.in

6.0 Not Used

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

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

9.0 **Assessment of Capacity of Bidders:**

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

- I. **LOAD**: Load takes into consideration **ALL** the contracts of the Bidder under execution with BHEL Regions, irrespective of whether they are similar to the tendered scope or not. The 'Load' is the sum of the unit wise identified packages (refer Table-1) for contracts with BHEL Regions. The cut off month for reckoning 'Load' shall be the month, two (2) months preceding the month corresponding to the 'latest date of bid submission', in the following manner:

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

- i). **Total number of Packages**

Total number of Packages in hand = P

Where

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

- II. **PERFORMANCE**: Here 'Monthly Performance' of the bidder for all the packages (**under execution/** executed during the 'Period of Assessment' in all the Power Sector Regions of BHEL) **SIMILAR** to the packages covered under the tendered scope, excepting packages not commenced shall be taken into consideration. The 'Period of Assessment' shall be 6 months preceding the cut off month. The cut off

month for reckoning 'Period of Assessment' shall be the month two (2) months preceding the month corresponding to the 'latest date of bid submission', in the following manner:

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

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

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

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

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

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

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

	the 'period of assessment for corresponding similar Package (as in row 1)								
3	Monthly performance scores for the corresponding period (as in Row 2)	S ₁₋₁ , S ₁₋₂ , S ₁₋₃ , S ₁₋₄ , ... S _{1-T1}	S ₂₋₁ , S ₂₋₂ , S ₂₋₃ , S ₂₋₄ , ... S _{2-T2}	S ₃₋₁ , S ₃₋₂ , S ₃₋₃ , S ₃₋₄ , ... S _{3-T3}	S ₄₋₁ , S ₄₋₂ , S ₄₋₃ , S ₄₋₄ , ... S _{4-T4}	S ₅₋₁ , S ₅₋₂ , S ₅₋₃ , S ₅₋₄ , ... S _{5-T5}	S _{N-1} , S _{N-2} , S _{N-3} , S _{N-4} , ... S _{N-TN}	-----
4	Sum of Monthly Performance scores of the corresponding Package for the corresponding period (as in row-3)	S ₁	S ₂	S ₃	S ₄	S ₅	...	S _N	Sum (Σ) of columns (iii) to (ix) = S _T

ii) Calculation of Overall 'Performance Rating' (R_{BHEL}) in case 'similar Package/Packages' for the tendered scope ARE NOT AVAILABLE, during the 'Period of Assessment':

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

- a) 'Period of Assessment.
- b) 12 months preceding the cut-off month
- c) 24 months preceding the cut-off month
- d) 36 months preceding the cut-off month

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

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

Sl no	Overall Performance Rating (R _{BHEL})	Corresponding value of 'L'
1	=60	NA
2	> 60 and ≤ 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 9.I)

IV. **Explanatory note:**

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

Table-1

	Civil	Electrical & CI	Mechanical
	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). CI iii). Others (Elec & CI)	i). Boiler & Aux (All types including CW Piping if applicable) ii). Power Cycle Piping/Critical Piping iii). LP Piping iv). ESP v). Steam Turbine Generator set & Aux vi). Gas Turbine Generator set & Aux vii). Hydro Turbine Generator set & Aux viii). Turbo Blower (including Steam Turbine) ix). Material Handling x). Material Management xi). Material Handling & Material Management xii). Others (Mechanical)

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

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

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

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

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

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

In case assessment of ‘FIRST TIMER’ cannot be done for 9 months due to **completion of work in less than 9 months**, the ‘FIRST TIMER’ tag will be removed and the vendor shall be considered as ‘NEW VENDOR’ for any new tender/s, provided the average score for which Performance Evaluation has been done, is not less than 60%.

- d) In the unlikely event of all bidders shortlisted against Technical and Financial Qualification criteria not meeting the criteria on ‘Assessment of Capacity of Bidders’ detailed above, OR leads to a

single tender response on applying the criteria of 'Assessment of Capacity of Bidders' or due to non-approval by Customer, then BHEL at its discretion reserves the right to consider the further processing of the Tender based on the **Overall Performance Rating 'R_{BHEL}'** only, starting from the upper band.

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

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

- f) Performance evaluation in CL 9 above is applicable to Prime bidder and consortium partner (or Technical tie up partner) for their respective scope of work.

- 10.0 Since the job shall be executed at site, bidders must visit site/ work area and study the job content, facilities available, availability of materials, prevailing site conditions including law & order situation, applicable wage structure, wage rules, etc before quoting for this tender. They may also consult this office before submitting their offers, for any clarifications regarding scope of work, facilities available at sites or on terms and conditions.
- 11.0 For any clarification on the tender document, the bidder may seek the same through e-procurement portal , as per specified format, within the scheduled date for seeking clarification, from the office of the undersigned. BHEL shall not be responsible for receipt of queries after due date of seeking clarification due to postal delay or any other delays. Any clarification / query received after last date for seeking clarification may not be normally entertained by BHEL and no time extension will be given.
- 12.0 BHEL may decide holding of pre-bid discussion [PBD] with all intending bidders as per date indicated in the NIT. The bidder shall ensure participation for the same at the appointed time, date and place as may be decided by BHEL. Bidders shall plan their visit accordingly. The outcome of pre-bid discussion (PBD) shall also form part of tender.
- 13.0 In the event of any conflict between requirement of any clause of this specification/ documents/drawings/data sheets etc or requirements of different codes/standards specified, the same to be brought to the knowledge of BHEL in writing for clarification before due date of seeking clarification (whichever is applicable), otherwise, interpretation by BHEL shall prevail. Any typing error/missing pages/ other clerical errors in the tender documents, noticed must be pointed out before pre-bid meeting/submission of offer, else BHEL's interpretation shall prevail.
- 14.0 Unless specifically mentioned otherwise, bidder's quoted price shall deemed to be in compliance with tender including PBD.
- 15.0 Bidders shall submit Integrity Pact Agreement (Duly signed by authorized signatory who signs in the offer), **if applicable**, along with techno-commercial bid. This pact shall be considered as a preliminary qualification for further participation. **The names and other details of Independent External Monitor (IEM) for the subject tender is as given at point (1) above.**
- 16.0 The Bidder has to satisfy the Pre Qualifying Requirements stipulated for this Tender in order to be qualified. The Price Bids of only those bidders will be opened who will be qualified for the subject job on the basis of satisfying the Pre Qualification Criteria specified in this NIT as per Annexure-I (as applicable), past

performance etc. and date of opening of price bids shall be intimated to only such bidders. BHEL reserves the right not to consider offers of parties under HOLD.

17.0 NOT USED.

18.0 An email intimation regarding e - price bid opening shall be sent to all technocommercially qualified parties .Validity of the offer shall be for **six months** from the latest due date of offer submission (including extension, if any) unless specified otherwise.

19.0 BHEL reserves the right to decide the successful bidder on the basis of Reverse Auction process. In such case all qualified bidders will be intimated regarding procedure/ modality for Reverse Auction process prior to Reverse Auction and price will be decided as per the rules for Reverse Auction. .

However, if reverse auction process is unsuccessful as defined in the RA rules/procedures, or for whatsoever reason, then the sealed 'PRICE BIDS' will be opened for deciding the successful bidder. BHEL's decision in this regard will be final and binding on bidder.

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

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

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

23.0 Not used.

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

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

26.0 The 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.

27.0 BHEL reserves the right to go for **Reverse Auction (RA)** instead of opening the price bid, submitted by the bidder. This will be decided after techno-commercial evaluation. All bidders to give their acceptance 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.

In case BHEL decides to go for Reverse Auction, only those bidders who have given their acceptance to participate in RA will be allowed to participate in the Reverse Auction. Those bidders who have given their acceptance to participate in Reverse Auction will have to necessarily submit „online sealed bid“ in the Reverse Auction. Non-submission of "online sealed bid" by the bidder will be considered as tampering of the tender process and will invite action by BHEL as per extant guidelines in vogue."

Information and General Terms and Conditions governing RA shall form part of the RFQ/ Enquiry.

28.0 It may please be noted that **guidelines/rules** in respect of Suspension of Business dealings', 'Vendor evaluation format', 'Quality, Safety & HSE guidelines', 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**".

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

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

Type under MSE	SC/ST owned	Others
Micro		
Small		

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

MSE suppliers can avail the intended benefits only if they submit along with the offer, attested copies of either EM-II certificate having deemed validity (five years from the date of issue of acknowledgement in EM-II) or valid NSIC certificate or EM-II certificate along with attested copy of a CA certificate (format enclosed as Annexure – 4 where deemed validity of EM-II certificate of five years has expired) applicable for the relevant financial year (last audited). Date to be reckoned for determining the deemed validity will be the date of bid opening (Part 1 in case of two part bid). Non submission of such documents will lead to consideration of their bids at par with other bidders. No benefits shall be applicable for this enquiry if any deficiency in the above required documents are not submitted before price bid opening. If the tender is to be submitted through e-procurement portal, then the above required documents are to be uploaded on the portal. Documents should be notarized or attested by a Gazetted officer.

MSEs shall be exempted from payment of tender fee.

MSEs shall be exempted from payment of earnest money at the time of tender deposit. However, there is no exemption of security deposit submission.

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

31.0 Order of Precedence

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

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

for BHARAT HEAVY ELECTRICALS LTD
(SCT)

Enclosure:-

- (i) Annexure-1: Pre Qualifying criteria.
- (ii) Annexure-2: Check List.
- (iii) Annexure-3: Modification / Deletions in Standard Clause of General Conditions of Contract (GCC) or Special Conditions of Contract (SCC)
- (iv) Annexure-4: Chartered Accountant certificate for MSMED
- (v) Annexure-5 General Terms and Conditions of Reverse Auction (RA)
- (vi) Annexure-6: Authorization of representative who will participate in the online Reverse Auction Process
- (vii) Annexure-7: Feedback form
- (viii) Annexure-8: Integrity Pact
- (ix) Other Tender documents as per this NIT.

ANNEXURE - 1**PRE QUALIFYING REQUIREMENTS**

SL NO	PRE QUALIFICATION CRITERIA	Bidders claim in respect of fulfilling the PQR Criteria
A	Submission of Integrity Pact duly signed	Applicable
B	Technical Criteria	Applicable
B-1	Bidder who wish to participate should have executed works of similar nature of at least	
B1.1	One Boiler/ESP of one unit of 190 MW or higher or One STG of 400 MW or higher, under direct order of BHEL	
B1.2	during last 7 years, as on the date of opening of Technical Bid.	
C	Financial Criteria	Applicable
C-1	TURNOVER Bidders should have achieved an average annual financial turnover (Audited) of Rs. 568 Lacs or more over last three Financial Years (FY) i.e 2012-2013, 2013-2014,2014-2015.	
C-2	NETWORTH Net worth of the bidder based upon the latest Audited Accounts as furnished for 'C 1' above should be positive.	Applicable
C-3	PROFIT Bidder must have earned cash profit in any one of the three Financial Years as applicable in the last three Financial Years defined in 'C 1' above on latest Audited Accounts.	Applicable
D	Relevant documents meeting above requirement at 'B' and 'C' shall be submitted by bidder	Applicable
E	Assessment of Capacity of Bidder to execute the work as per SI no. 9 of NIT	Applicable
F	Approval of Customer by BHEL	Applicable
G	Consortium criteria	Not Applicable
Explanatory Notes for QR 'A'		
<ol style="list-style-type: none"> For B , 'Executed' means :The bidder should have achieved the criteria specified in the QRs even if the Contract has not been completed or closed,by the date of Technical Bid opening If the qualifying work is completed in the Seven (7) years period specified above, even if it has been started earlier, the same will also be considered meeting the qualifying requirements. Bidder to submit Audited Balance Sheet and Profit and Loss Account for the respective years as given above along with all annexure. In case audited financial statements have not been submitted for all the three years as indicated in "C", then the applicable audited statements submitted by the bidders against the requisite three years, will be averaged for three years. If financial statements are not required to be audited statutorily, then instead of audited financial statements, financial statements are required to be certified by Chartered Accountant. 		

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

ANNEXURE - 2**CHECK LIST****NOTE:- Tenderers are required to fill in the following details and no column should be left blank**

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

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

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

DATE :

AUTHORISED SIGNATORY
(With Name, Designation and Company seal)

Annexure-3**Modification / Deletions in Standard Clause of General Conditions of Contract (GCC)**

	Modification/ deletion in Price Variation Compensation Clause no. 2.17of GCC:
10.2.1	Clause No. 2.17.5 of GCC shall be modified as below:- Base date shall be the calendar month of the schedule completion date of the contract. Schedule Completion date shall be the actual start date plus delivery period as defined in clause no 6.0 of TCC (Part-I)
10.2.2	Clause No. 2.17.9 shall be modified as:- PVC shall be applicable only for the extended period of contract (if any) after the schedule completion date. However, the total Quantum of Price Variation amount payable/recoverable shall be regulated as follows:
10.2.2.1	For the portion of backlog attributable to the contractor, no PVC shall be paid.
10.2.2.2	For the period of Force Majeure, the PVC (if applicable) will be limited to the indices applicable at the beginning of the force majeure period.
10.2.2.3	For the portion of backlog attributable to BHEL, the PVC will be as per the indices applicable for the respective months
10.2.2.4	The total amount of PVC shall not exceed 15% of the cumulatively executed contract value. Executed contract value for this purpose is exclusive of PVC, ORC, Supplementary/Additional Items and Extra works.
10.3	All other terms & conditions of Clause No. 2.17 of GCC shall remain same.

ANNEXURE - 4**Certificate by Chartered Accountant on letter head**

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

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

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

Rs.....Lacs

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

Rs.....Lacs

(Strike off which is not applicable)

The above investment of Rs.....Lacs is within permissible limit of
 Rs.....Lacs for Micro / Small **(Strike off which is not applicable)**

Category under MSMED Act 2006.

Or

The company has been graduated from its original category (Micro/Small) (Strike off which is not applicable) and the date of graduation of such enterprise from its original category is (dd/mm/yyyy) which is within the period of 3 years from the date of graduation of such enterprise from its original category as notified vide S.O. No. 3322(E) dated 01.11.2013 published in the gazette notification dated 04.11.2013 by Ministry of MSME.

Date:

(Signature)

Name -

Membership number -

Seal of Chartered Accountant

GENERAL TERMS AND CONDITIONS OF REVERSE AUCTION (RA)

Against this enquiry for the subject item/ system with detailed scope of supply as per enquiry specifications, BHEL may resort to "REVERSE AUCTION PROCEDURE" i.e., ON LINE BIDDING (THROUGH A SERVICE PROVIDER). The philosophy followed for reverse auction shall be English Reverse (No ties).

1. For the proposed reverse auction, technically and commercially acceptable bidders only shall be eligible to participate.
2. Those bidders who have given their acceptance for Reverse Auction (quoted against this tender enquiry) will have to necessarily submit "online sealed bid" in the Reverse Auction. Non submission of "online sealed bid" by the bidder for any of the eligible items for which techno commercially qualified, will be considered as tampering of the tender process and will invite action by BHEL as per extant guidelines in vogue.
3. BHEL will engage the services of a service provider who will provide all necessary training and assistance before commencement of on line bidding on internet.
4. In case of reverse auction, BHEL will inform the bidders the details of Service Provider to enable them to contact & get trained.
5. Business rules like event date, time, bid decrement, extension etc. also will be communicated through service provider for compliance.
6. Bidders have to fax the Compliance form before start of Reverse auction. Without this, the bidder will not be eligible to participate in the event.
7. In line with the NIT terms, BHEL will provide the calculation sheet (e.g., EXCEL sheet) which will help to arrive at "Total Cost to BHEL" like Packing & forwarding charges, Taxes and Duties, Freight charges, Insurance, Service Tax for Services and loading factors (for non-compliance to BHEL standard Commercial terms & conditions) for each of the bidder to enable them to fill-in the price and keep it ready for keying in during the Auction.
8. Reverse auction will be conducted on scheduled date & time.
9. At the end of Reverse Auction event, the lowest bidder value will be known on auction portal.
10. The lowest bidder has to fax/e-mail the duly signed and filled-in prescribed format for price breakup including that of line items, if required, as provided on case-to-case basis to Service provider within two working days of Auction without fail.
11. In case BHEL decides not to go for Reverse Auction procedure for this tender enquiry, the Price bids and price impacts, if any, already submitted and available with BHEL shall be opened as per BHEL's standard practice.
12. Bidders shall be required to read the "Terms and Conditions" section of the auctions site of Service provider, using the Login IDs and passwords given to them by the service provider before reverse auction event. Bidders should acquaint themselves of the

„Business Rules of Reverse Auction“, which will be communicated before the Reverse Auction.

13. If the Bidder or any of his representatives are found to be involved in Price manipulation/ cartel formation of any kind, directly or indirectly by communicating with other bidders, action *as per extant BHEL guidelines*, shall be initiated by BHEL and the results of the RA scrapped/ aborted.
14. The Bidder shall not divulge either his Bids or any other exclusive details of BHEL to any other party.
15. In case BHEL decides to go for reverse auction, the H1(s) bidder (whose quote is highest in online sealed bid) may not be allowed to participate in further RA process.

ANNEXURE – 6**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 – 7**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	

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 IPC/ PC 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 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.

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 Bidder(s)/ Contractor(s) undertake(s) to obtain from all subcontractors a commitment consistent with this Integrity Pact and report Compliance to the Principal. This commitment shall be taken only from those sub-contractors whose contract value is more than 20 % of Bidder's/ Contractor's contract value with the Principal. The Bidder(s)/ Contractor(s) shall continue to remain responsible for any default by his Sub-contractor(s).
- 6.2 The Principal will enter into agreements with identical conditions as this one with all Bidders and Contractors.
- 6.3 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 /Sub-contractors

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.
- 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 As soon as the Monitor notices, or believes to notice, a violation of this agreement, he will so inform the Management of the Principal and request the Management to discontinue or take corrective action, or heal the situation, or to take other relevant action. The Monitor can in this regard submit non-binding recommendations. Beyond this, the Monitor has no right to demand from the parties that they act in a specific manner, refrain from action or tolerate action.
- 8.6 The Monitor will submit a written report to the CMD, BHEL within 8 to 10 weeks from the date of reference or intimation to him by the Principal and, should the occasion arise, submit proposals for correcting problematic situations.
- 8.7 The CMD, BHEL shall decide the compensation to be paid to the Monitor and its terms and conditions.
- 8.8 If the Monitor has reported to the CMD, BHEL, a substantiated suspicion of an offence under relevant IPC / PC 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.

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

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

Section 9 – Pact Duration

9.1 This Pact begins and shall be binding on and from the submission of bid(s) by bidder(s). It expires for the Contractor 12 months after the last payment under the respective contract and for all other Bidders 6 months after the contract has been awarded.

9.2 If any claim is made / lodged during this time, the same shall be binding and continue to be valid despite the lapse of this pact as specified as 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) _____

Rev 01

1st June

2012

TECHNICAL CONDITION OF CONTRACT (TCC)

(Document No. PS: MSX:TCC)

BHARAT HEAVY ELECTRICALS LIMITED



TECHNICAL CONDITIONS OF CONTRACT (TCC)

TECHNICAL CONDITION OF CONTRACT (TCC)

TENDER NO. BHEL/ NR/SCT/TANDA /ESP /1012

FOR

MATERIAL MANAGEMENT AND ERECTION, TESTING, COMMISSIONING, TRIAL OPERATION & HANDING OVER OF ELECTROSTATIC PRECIPITATOR (ESP) OF UNIT NO.1 & 2 AT 2X660 MW, TANDA STPS OF NTPC, TANDA.

PART-I OF TCC



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

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Sl. No.	DESCRIPTION	Chapter No.	Pages
	Part-I : Contract Specific Details		
1.	Project Information	Chapter-I	
2.	Scope of Works	Chapter-II	
3.	Facilities to be provided by BHEL/ Contractor	Chapter-III	
4.	T & Ps and MMEs to be deployed by contractor	Chapter-IV	
5.	T & Ps and MMEs to be deployed by BHEL on sharing basis	Chapter-V	
6.	Time Schedule	Chapter-VI	
7.	Terms of Payment	Chapter-VII	
8.	Taxes and other duties	Chapter-VIII	
9.	Any other Requirement	Chapter-IX	
10.	Other Requirements	Chapter-X	
11.	Annexures	Chapter-XI	
12.	Rate Schedule	Chapter-XII	

IMPORTANT INFORMATION

- 1. It is a combined Tender Specification for the job of ESP and Material Handling & Material Management as detailed in the specification hence forth.**
- 2. Bidders shall quote their rates for the total scope of Material management & Erection, Testing and Commissioning of ESP in Section B of Volume II Price Bid Specification. While Amount for material management and erection testing and commissioning will be separated as per price breakup attached in chapter -XII**

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter-I: Project Information

Sl. No.	Title	Description
1.	Name of the Owner	NATIONAL THERMAL POWER CORPORATION LTD. (NTPC)
2.	Address	TANDA Thermal Power Station Village: BAHADURPUR, District: AMBEDKAR NAGAR (U.P.)
3.	New Installation	2 x 660 MW
4.	Nearest Railway station	AKBARPUR (20 KM) on North Central Railway
5.	Nearest Road	FAIZABAD (65 KM)
6.	Nearest City	FAIZABAD (65 KM)
7.	Nearest Airport	LUCKNOW (240 KM), VARANASI (165 KM)
8.	Highest Temperature	44 deg C
9.	Lowest Temperature	4 deg C
10.	Elevation	102 metres

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter-II: Scope of Work

2.0	BHEL has been awarded the work of Design, Engineering, Supply, Erection, Testing & Commissioning & Handing over ESP package of 2X660 MW Super Critical Thermal Power plant at Tanda, U.P.by National Thermal Power Corporation (NTPC) .
2.1	Scope of Work : The scope of work under this tender consists of following :
2.2	Service Portion (ESP)
2.2.1	The scope of work under this tender consists of unloading, verification and stacking of ESP material, handling and transportation of equipment and materials for pre-assembly, erection, testing, commissioning and handing over of Electrostatic Precipitator for Unit No.1 & 2 at 2 x 660 MW Super Thermal Power Plant at Tanda, U. P.
2.2.2	The scope of material management work of ESP not limited to but covers mainly following:
2.2.2.1	Receipt of materials at the BHEL Site stores, dispatched by BHEL/ BHEL VENDOR/ BHEL SITE/ ANY OTHER SOURCE (as per BHEL Site requirement), on door delivery basis through road transport and unloading of that material thereof.
2.2.2.2	Unloading of all types of consignments directly from Trailers at the location informed by BHEL, by suitable Crane or by any other method approved by BHEL Engineer. All the requisite equipment to be arranged by the contractor.
2.2.2.3	Collection of materials dispatched by road transport/ rail on godown delivery basis from transporters'/railway godowns, loading at transporters/ railway godown, local transport up to BHEL stores/ storage yard and unloading thereof.
2.2.2.4	Preliminary verification of materials at the time of unloading from road transport vehicle or while receiving consignments from railway/ trasporters' godown - as the case may be, reporting immediately the discrepancies like damages and shortages noticed.
2.2.2.5	Detailed verification of materials with respect to packing list and/ or loading advice slip. The work shall include unpacking of boxes/ crates, detailed verification, repacking of boxes/ crates, where called for, and subsequently preparation and submission of Receipt Inspection Reports/ Verification reports.
2.2.2.6	Stacking and storing of material at BHEL open storage yard/ covered stores/ closed sheds, submission of stacking/ storing records.
2.2.2.7	Preservation of the materials in accordance with BHEL's preservation manual and/or as per BHEL's instructions. Preservation material shall be provided by BHEL.
2.2.2.8	General cleaning, grass cutting and upkeep of storage yard, covered and semi-closed stores sheds within the quoted rates for unloading, verification and stacking.
2.2.2.9	Providing materials management services as specified in relevant chapter of this NIT

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter-II: Scope of Work

2.2.2.10	Re-handling and restacking of materials as and when called for by BHEL. This shall also include excess/ redundant/ scrap materials returned to stores by BHEL`s Sub-contractors.
2.2.2.11	Handling and loading of outgoing materials those are to be sent to other destination.
2.2.2.12	<p>The contractor under this contract shall also provide free of cost services of following manpower exclusively for use by BHEL;</p> <p>Qualified computer operators (minimum 'O' level qualified) capable of operating the material management software package / other packages available at site or for office work for total 66 man months,</p> <p>Unskilled workers for working in store, colony & office for a total 198 man months. Persons so deployed shall have to work in extended hours whenever required. Workmen provided as per the above provisions shall be fully trained and experienced in the nature of work for which they are deployed.</p> <p>In case contractor fails to provide above-mentioned engineers as desired by BHEL, the latter shall have the right to hire such services from other agencies at the risk and cost of the contractor. In case these services are not utilized for any reason whatsoever, fully or partly, recovery at the rate of the prevailing minimum wages at TANDA for the categories given plus 10% will be made from the final bill of the contractor</p>
2.2.2.13	It will be responsibility of the contractor to keep in touch with M/s NTPC and BHEL at site to find out the arrival of consignments, and release of truck/trailers after unloading.
2.2.2.14	Detailed verification of materials with reference to packing list / Loading advise slip / etc., after unpacking of boxes & crates; repacking where called for, after detailed verification; preparation of receipt inspection reports etc shall be carried out within the quoted rate within 30 days of the unloading. If the verification is not carried out within 30 days for reasons attributable to the contractor, then BHEL is having right to carryout the verification at the risk and cost of the contractor
2.2.2.15	BHEL will provide free of cost all necessary preservatives, paints, thinners, rust preventives, grease, lubricants and end caps to contractor for preservation of components. All tools & tackles and other consumables required for preservation of components including supervision shall however be provided by contractor at his own cost. Preservation of components includes applying preservatives, paints, rust preventives, greasing of threaded portions, fixing of end caps in position for pressure parts, repainting of work order / DU numbers, component codes etc. After preservation wherever necessary, components will be stacked properly as per original stacking for which no additional payment shall be made.

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2.2.2.16	After the stacking/verification, the materials may need to be restacked / shifted within the storage area as per the instructions of the Engineer. The activity of restacking shall be applicable and payable only if the material after verification needs to be shifted and restacked to different location with the help of trailer, crane as per the instruction of BHEL Engineer. Contractor has to take separate approval of BHEL site in-charge for this re-shifting of material.
2.2.2.17	It shall be the responsibility of the contractor to keep in touch with Engineer at site and find out arrival of road consignments. The Contractor shall collect all the parcel way bills / lorry waybills from BHEL site office either personally or through an authorized representative. The contractor or his authorized representative shall, for the purpose, visit the said office every day and collect available GR, RR, LWB, and PWB etc. While collecting the GR, RR, LWB, PWB, contractor or his authorized representative will sign the register maintained for the purpose indicating date and time of collection. The contractor shall keep in touch with carriers and arrange to effect delivery of consignments immediately on their receipts. Delay may cause deterioration of goods apart from attracting demurrage charges. Contractor shall also maintain a register indicating date of RR, LWB, PWB, date of collection of the materials from road transport agencies / lorries and date of stacking them at storage yard of BHEL.
2.2.2.18	It is possible that in certain cases, dispatch documents may not be received in time but BHEL may receive Photostat copies of the same. It is, therefore, the responsibility of the contractor to collect these Photostat copies while obtaining indemnity bond from BHEL authorities at site.
2.2.2.19	Payment of all demurrage / wharfages that are due to contractor's fault, would be the responsibility of contractor and to his account. If BHEL has to make payment of demurrage / wharfages along with freight, the amount so paid as demurrage / wharfages, for the reasons stated above, shall be paid by the contractor forthwith or would be recovered from bills of the contractor.
2.2.2.20	In any case contractor will pursue with concerned Carrier authorities at all level (local/HQ etc.) for waiver / reduction to the minimum of such demurrage charges. Whenever such demurrages become payables due to reasons not attributable to contractor, contractor will immediately bring it to the notice of BHEL with specific request to bear such charges. The decision of the Engineer in such case will be final and binding on the contractor.
2.2.2.21	Any discrepancy / shortage / damage found in the consignment after taking delivery from the carriers after giving clear receipt would be the responsibility of the contractor and the amount liable to be lost by BHEL on such accounts is

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	recoverable from the contractor. In case of apparent damages / shortages in consignments /packing noticed by the contractor, such cases shall be brought to the notice of BHEL and cleared only with their consent/approval.
2.2.2.22	It would be the responsibility of the contractor to examine the packages, consignments, etc. on arrival and bring to the notice of carriers and BHEL Authorities regarding loss / damages, if any, observed in the consignments proposed to be taken delivery. Before taking delivery, particularly of consignments in 'smalls', the weight of the package shall be checked with the invoiced weight / contents of the packages and any discrepancy shall be reported immediately to BHEL/ carriers. In all the cases of loss / damages the contractor will take open delivery from the carriers. They shall forward such Open Delivery Certificates (ODC) to the Engineer within 7 days of retiring such consignments. All expenses connected therewith shall be to the account of contractor. BHEL reserves right to claim losses, if any, accrued to BHEL in the event of contractor's non-compliance to above.
2.2.2.23	BHEL reserves the right to recover from the contractor any loss which arises out of undue delay / discrepancy / shortage / damage or any other cause during transit and stacking (between the Road / carriers godowns / weigh bridges and BHEL storage yards / store sheds / project site), when the custody of the equipment is with the contractor.
2.2.2.24	Certain items may be dispatched with tie rods/ strips welded with frame carrying items and with trailer. These tie rods / strips are required to cut by using Gas flame or by other method as directed by Engineer for unloading of materials.
2.2.2.25	Since, the trucks / trailers are expected to arrive during any time of the day / night, the contractor shall have his workmen round the clock at site as well as other places as required to unload the materials. Consignments coming on Sundays and Holidays are also required to be handled by the contractor promptly. It will be the responsibility of the contractor to contact the site Engineer / his authorized representative of BHEL at their residence, if required, and obtain instructions to make suitable arrangements. The detention charges, if any, in the event of delay in unloading from the carrier, will be to contractor's account.
2.2.2.26	It shall be the responsibility of the contractor, to provide all necessary facilities and tools to open the packages, in the presence of the Engineer, verifying their contents, re-packing wherever and whenever necessary, properly stacking them as may be directed by the Engineer. These works should be so done so as to facilitate proper handling, periodical verification of materials, receipt position, stock

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	<p>taking etc.</p> <p>The contractor shall have experienced persons at site who can maintain the records of dispatch / receipt/ stacking / verification / shortage / damage / missing items etc.</p>
2.2.2.27	<p>All materials shall be stored at least 6" above ground level by use of concrete sleepers. No material shall be left to remain on ground at any time. Materials shall not be stacked in low-lying areas, where they are likely to get flooded during rains.</p>
2.2.2.28	<p>It is possible that certain heavy items / consignments will require fabrication of a suitable shed over it. These sheds will be covered with suitable sheets or tarpaulin. The contractor will be required to fabricate such sheds. All materials required for this will be provided by BHEL. However all expenses towards manpower, T&P, consumables etc will be borne by the contractor. After the completion of the work the contractor will dismantle the same and return these materials back to the stores. The contractor will be paid @ Rs. 9500/- per MT for such works.</p> <p>NO ADDITIONAL PAYMENT SHALL BE MADE IN CASE THE STRUCTURE IS FABRICATED OF SCAFFOLDING PIPES, CLAMPS & GI SHEETS. IN SUCH CASES THE MATERIAL SHALL BE ISSUED BY BHEL FREE OF CHARGE TO THE CONTRACTOR. HE SHALL ENSURE THAT THE SAME ARE RETURNED TO THE STORE AFTER THE EQUIPMENT HAS BEEN ISSUED.</p>
2.2.2.29	<p>The material / equipment requiring indoor storage will be handled and stacked inside the storage shed (provided by BHEL) by the contractor using own material handling equipments</p>
2.2.2.30	<p>For checking / verification of the components / packages with packing slips GR/ LWB etc., sufficient experienced persons and other facilities shall be provided by the contractor as and when required by the Engineer</p>
2.2.2.31	<p>Stacking of the material shall be done as per the instructions and to the satisfaction of the Engineer. The materials shall be so stacked that the same should facilitate easy handling. In the event of any improper stacking BHEL may ask the contractor to re-stock the material properly or failing which BHEL may get the job done by any other agency at the risk and cost of the Contractor.</p>
2.2.2.32	<p>The contractor shall execute the work in the most substantial and workman like manner. The stores shall be handled with care and diligence. Any loss to BHEL due to contractor's lapse / negligence shall have to be made good by the</p>

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	contractor.
2.2.2.33	In case contractor is not able to unload, transport, stack the material at a pre-determined area, as per direction of the Engineer for any reason whatsoever (including non-availability of crane, tractor trailer and other T&P etc.), BHEL shall be at liberty to get the work done by engaging other agency / equipment / T&P etc. at the risk and cost of the contractor.
2.2.2.34	If the contractor or his workmen shall break, deface injure or destroy any part of a building, road, Serbs, fenced enclosures, water pipes, cables, drains, electric or telephone posts or wires, trees, stored components or any other property or to any part of erected equipment etc., the contractor shall make the same good at his cost or in default the Engineer may cause the same to be made good by other workmen/agency or by other means and deduct the expense (of which the BHEL Engineer's decision is final) from any sum that may be then or at any time thereafter become due to the contractor or from his security deposit or any other money due
2.2.2.35	It shall be the responsibility of the contractor to keep the storage areas (closed / semi-closed / open) in neat and tidy conditions. Any vegetation like grass, bushes, Sarkandas etc. shall be cut periodically in open storage area & removed as per requirement & instructions of BHEL Engineer within the contractual value. All surplus / unusable packing materials shall be removed and deposited at location(s) specified by BHEL within the project premises (including weighing of the same within the project premises if required).
2.2.2.36	Normally the consignments from BHEL's manufacturing units / their sub-suppliers are sent on freight paid basis. In case any consignment is received at any place on freight to pay basis, it will be the responsibility of the contractor to pay the freight and take delivery of such consignments. The amount of freight paid by the contractor at any point of time in such cases will be limited to Rs. 5,000/-. However, the freight paid by the Contractor will be reimbursed by BHEL within a week's time on production of relevant receipts. In case of freight amounts exceeds Rs. 5,000/- contractor may request BHEL well in time to issue cheque /draft for such amounts in favor of carriers towards freight charges. Delay in issuance of cheque/ drafts as above shall not in any case be taken as a cause of delay in taking delivery of consignment resulting in demurrage leviable by carriers. Receipt of payment and proof of taking delivery of consignment shall be submitted to BHEL by the contractor.
2.2.2.37	In case some materials are required to be dispatched from TANDA to manufacturing units, other sites or any other place, the contractor may be asked by the Engineer to get the same packed, transport it to nearest Railway Station / Carrier's godowns and get the same booked. There shall

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	<p>not be any separate payment to the contractor for Handling and loading of outgoing materials.</p> <p>In case of material is required to be booked as freight paid, the freight for the consignment limited to Rs.5,000/- shall be paid by the contractor. However, it shall be reimbursed by BHEL on submission of receipt within a week's time. The funds for freight charges exceeding Rs. 5,000/- shall be arranged by BHEL. Packing material required shall be provided by BHEL free of cost.</p>
2.2.2.38	<p>In case some of consignments are to be dispatched on full truck /trailer load basis, where the carriers will place their fleet inside the plant for loading, the contractor may be asked to collect them from different locations of store sheds/yard and load by using his crane and labour.</p>
2.2.2.39	<p>The contractor will arrange for gate passes and any other permits required for carrying out his work from the respective agencies at his own cost. He will also comply with regulations of the customer within the project area, any of the State Government and other Government agencies.</p>
2.2.2.40	<p>The owner / employer or his authorized agents may inspect stores, storage yard, etc during the currency of the contract awarded to him. The contractor shall make necessary arrangements for such inspection and carry out the rectification pointed out by the owner/employer without any extra cost to the owner / employer. No cost whatsoever such duplication of inspection of work be entertained.</p>
2.2.2.41	<p>For any exigencies during execution of the contract, the contractor shall have to depute his personnel for collection/delivery of any material meant for site from/to out station if desired and instructed by the Engineer. The contractor will however be reimbursed expenses incurred for such work for person deputed, as below:-</p> <p>Second class train fare with reservation / supplementary charges/bus fare subject to furnishing details regarding ticket numbers, journey details, amount of fare etc.</p> <p>Local conveyance charges (Actual bus / cycle rickshaw/ auto rickshaw fare for local journeys at out station) as permitted by the Engineer.</p> <p>Daily allowances @ Rs.200/- per day and @ Rs.500/- per day for lodging.</p> <p>Postal / telegraphic / telephones charges, if any, subject to production of proof of having incurred such expenditure.</p> <p>Freight and other charges, if any, paid on production of actual receipts.</p> <p>Payment for the above will be made by BHEL within a month from the date of submission of bill along with details / desired documents by the contractor subject to completion of work assigned to contractor personnel</p>

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	and to the entire satisfaction of the Engineer																
2.2.2.42	<p>Contractor shall prepare, maintain and update various MM records, associated with materials management operation of BHEL at project site. Two systems of record keeping/capturing information & data at various stages are in vogue viz.</p> <p>I. Manual ledgers & records. II. Computerized database application:</p> <p>BHEL has developed a software application named site operations management system (SOMS) that Captures all the data in the entire chain of transactions starting with Master list of project materials, records of dispatch, receipt, Inspection, issue, return, consumption etc.</p> <p>Some of these records are master shipping/packing list, LR/RR register, Daybook register, stock register, records of issues to & return of materials in respect of various erection subcontractors, insurance claim records, periodical status reports in various formats covering desired aspects and output information as per BHEL/Client's requirement.</p> <p>Contractor will provide necessary hardware, software & stationary etc. and shall take utmost care to ensure that these properties and records are protected from any Damage or loss. BHEL will recover the cost of such property / expenses of restoration from the contractor with 30% overhead charges in case of any loss/damage attributable to negligence/failure on contractor's part.</p> <p>Contractor shall engage skilled & qualified personnel for material management in the area of material receipt & its unloading, verification of materials, preservation of materials, record keeping of materials & for dealing with insurance claims. For some of the above important area of works minimum deployment of workers shall be as follows:</p> <table border="1"><thead><tr><th>SL NO</th><th>ACTIVITY/ DESCRIPTION</th><th>MINIMUM NO. OF PERSONS</th><th>REMARKS</th></tr></thead><tbody><tr><td>1</td><td>MATERIAL RECEIPT/UNLOADING, COLLECTION/ BOOKINGS</td><td>2</td><td>TO BE DEPLOYED FROM START OF CONTRACT PERIOD</td></tr><tr><td>2</td><td>DETAILED VERIFICATION</td><td>1</td><td>TO BE DEPLOYED FROM START OF CONTRACT PERIOD</td></tr><tr><td>3</td><td>MATERIAL ISSUE (ESP)</td><td>1</td><td>TO BE DEPLOYED FROM START OF CONTRACT PERIOD</td></tr></tbody></table>	SL NO	ACTIVITY/ DESCRIPTION	MINIMUM NO. OF PERSONS	REMARKS	1	MATERIAL RECEIPT/UNLOADING, COLLECTION/ BOOKINGS	2	TO BE DEPLOYED FROM START OF CONTRACT PERIOD	2	DETAILED VERIFICATION	1	TO BE DEPLOYED FROM START OF CONTRACT PERIOD	3	MATERIAL ISSUE (ESP)	1	TO BE DEPLOYED FROM START OF CONTRACT PERIOD
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		4	PRESERVATION	1 + 2	GANG OF 2 LABOURS LEAD BY 1 QUALIFIED PERSON FROM 5 TH MONTH ONWARDS of CONTRACT PERIOD
		5	RECORD KEEPING	1	FROM START OF CONTRACT PERIOD
	<p>NOTE: THE NO. OF PERSONS INDICATED ABOVE IS TENTATIVE AND ACTUAL DEPLOYMENT MAY VARY BASED ON WORK LOAD AND SITE REQUIREMENT, NOR THE DEPLOYMENT ABSOLVES THE CONTRACTOR FROM HIS RESPONSIBILITY TOWARDS THE SATISFACTORY EXECUTION OF THE JOB</p>				
2.2.3	The scope of erection, testing, commissioning and handing over work of ESP not limited to but covers mainly following:				
2.2.3.1	Taking delivery of the ESP materials from the project storage yard, stores, sheds to erection site.				
2.2.3.2	Their preservation, safe keeping, watches and ward.				
2.2.3.3	Checking, dressing, chipping and leveling of foundations.				
2.2.3.4	Pre-assembly, erection, alignment of various equipment and grouting.				
2.2.3.5	Welding, heat treatment, radiography, UT and other non-destructive tests wherever required				
2.2.3.6	Pre commissioning, commissioning and other required tests i.e. Gas distribution test, Gas tightness test, etc as per the scope given in the tender specifications, drawings, documents and engineers instructions.				
2.2.3.7	Insulation and finish painting including supply of paints etc. for the entire				

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	equipments erected.
2.2.3.8	Works of all electrical, cabling and C&I
2.2.3.9	Unit trial operation, Resolving any deficiencies observed in ESP Unit- 1 & 2 of 2X660 MW Super Thermal Power Plant at Tanda, U. P. up to handing over of the unit to BHEL and their customer including preparation for PG test of the unit.
2.2.3.10	Assistance in PG test
2.2.3.11	The work shall conform to dimensions and tolerances given in various drawings and documents that will be provided during erection. If any portion of works is found to be defective in workmanship not conforming to drawings/ documents or other stipulations, the contractor shall dismantle and re-do the work duly replacing the defective materials at their own cost, failing which recoveries, as determined by BHEL, shall be effected from contractor's bills.
2.2.3.12	The intent of specification is to provide services according to the most modern and proven techniques and codes. The omission of specific reference to any method, equipment or material necessary for proper and efficient execution of this work shall not relieve the contractor of the responsibility of providing such facilities to complete the work without any extra compensation.
2.2.3.13	Total 108 nos hoppers/ ESP consisting SS corner tube. This covers approx. 7800 metre length of SS corner tube welding (6mm thick) in hopper with E-309 electrode . The corner tubes for hopper will be 6 mm thick stainless steel plate.
2.2.3.14	Approx. weight to be erected for the ESP shall be as indicated in Annexure-I. Accordingly, approx. weight to be erected shall be 20938 MT.
2.2.3.15	<p>The scope of work covers total ESP erection with its electrical & C&I work. Brief idea of ESP package is as below-</p> <ul style="list-style-type: none">• Independent casings including outside shell, structural steel supports and frame work, access ladders, platforms, safety rails, stairways, walk ways, access doors and weather proof pent house etc.• Flue gas inlet distribution system complete with perforated plates, turning vanes, deflector plates, flow splitters, guide vanes, provision of flue gas sampling ports, etc.• Collecting and emitting electrode systems.• Rapping system complete with structural supporting frame, drives, and automatic rapping control, etc.• Ash hoppers complete with panel type heaters, level monitors and indicators, outlet flanges, jointing material, poke holes, access doors and walkways beneath the hoppers.• Monorails with electrically operated hoists including monorail beam on the roof for

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	<ul style="list-style-type: none"> handling transformer rectifiers. • Water washing system for ESP and its hoppers along with all piping, valves and nozzles etc. • Cabling , junction boxes, complete C&I work of ESP package • Transformers, BAPCON system & accessories etc.
2.2.3.16	<p>Terminal Points</p> <p>Following are the terminal points for the scope of ESP erection-</p> <ul style="list-style-type: none"> • ESP Inlet gas duct flanges (matching flanges are covered in this scope of work) • ESP outlet gas duct flanges (matching flanges are covered in this scope of work) • ESP ash collection hopper outlet flanges • Clarified water supply will be available at approx. 3m elevation near 1st row of ESP column of unit 1. • Service/ instrument air supply will be available at approx. 3m elevation near 1st row of ESP column of unit 1. • End of drain piping to the nearest station drain • LT terminal of NTPC MCC/ switchgear
2.2.3.17	<p>Exclusions</p> <p>Following are excluded from the scope of this work-</p> <ul style="list-style-type: none"> • Flue gas ducting upto inlet flanges of the ESP streams and from outlet flanges of ESP streams onwards. • Station and instrument air compressors and other accessories • Air conditioning of the ESP control room for areas where solid state control equipment will be located. • Fire hydrant system in ESP area • Complete lighting system and lighting protection • Earthing mat below ground • LT switchgear

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	<ul style="list-style-type: none">• ESP column foundation, equipment foundation, paving and ash trenches below ESPs.• ESP control room building, compressor houses, ash handling control rooms.
2.3	Supply Portion (ESP)
2.3.1	Procurement of Paints Contractor has to supply all paints, primers and other consumables for painting of relevant area of ESP of Unit No.1 & 2. BHEL reserves the right to reject any material not found satisfactory. Contractor shall produce manufacturer's test certificate.
2.3.2	Note:
2.3.2.1	Material which will be supplied by contractor as per supply rate schedule for which separate order shall be issued. Price for supply items as per supply rate schedule remains firm i.e. price variation compensation close mentioned in clause no. 2.17 of GCC and overrun compensation in clause no. 2.12 of GCC of contract shall not be applicable for supply order.
2.3.2.2	Paints, primers etc to be procured from NTPC/BHEL approved suppliers.
2.3.2.3	Contractor has to supply paints required for painting the total scope of work as envisaged in service portion of contractor.
2.4	Separate order shall be issued for Service portion(ESP) and Supply Portion(paints).
2.5	SITE VISIT
2.5.1	The bidder shall visit the site, to acquaint themselves with the conditions prevailing at site and in & around the plant premises, together with all statutory, obligatory, mandatory requirements of various authorities before submission of bid.
2.6	SITE ORGANISATION
2.6.1	The contractor shall provide adequate staffing in the following areas in addition to the staffing requirements of execution as instructed/informed by BHEL:
2.6.1.1	Overall planning, monitoring & control.
2.6.1.2	Quality control and quality assurance.

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2.6.1.3	Materials management.
2.6.1.4	Safety, fire & security. Minimum 2nos quality and 2nos safety supervisors are to be deployed. However requirement of quality and safety supervisors may be varied as per project requirement.
2.6.1.5	Industrial relations and fulfilment of labour laws and other statutory obligations.
2.6.2	The contractor shall maintain a site organization of adequate strength in respect of manpower, construction machinery and other implements at all times for smooth execution of the contract. This organization shall be reinforced from time to time, as required to make up for slippage from the schedule without any commercial implication to BHEL. The site organization shall be headed by a competent construction manager having sufficient authority to take decisions at site.
2.6.3	On award of contract, the contractor shall submit to BHEL site organization chart indicating the various levels of experts to be deployed on the job. BHEL reserves the right to reject or approve the list of personnel proposed by the Contractor. The persons, whose bio-data have been approved by BHEL, will have to be posted at site and deviations in this regard will not generally be permitted.
2.6.4	The contractor should also submit to BHEL for approval a list of construction equipment, erection tools, tackle etc prior to commencement of site activities. These tools & tackles shall not be removed from site without written permission of BHEL.
2.6.5	The 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 15 workmen.
2.7	MOBILIZATION SCHEDULE
2.7.1	Contractor shall submit within 30 days of LOI date, detailed program (L2 schedule) of mobilization for material management work, construction, erection and commissioning, indicating deployment of resources like T&P and manpower, for approval to Site In-Charge or 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 These program would be amplified showing start of erection and subsequent activities and shall form the basis for site execution and detailed monitoring, The three monthly rolling program with the first month's program being tentative based on the site conditions would be prepared

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	based on these program. The Contractor shall also be involved along with the Customer/BHEL to tie up detailed resource mobilisation plan over the period of time of the contract matching with the performance targets.
2.7.2	The program would be jointly finalised by the site in-charge of the contractor with BHEL and Customer's project coordinator as well as the site planning representative. The erection program will also identify the sequential erectable tonnages
2.8	The customer M/s. NTPC 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.
2.9	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. Contractor shall ensure following:
2.9.1	Contractor has to maintain contact with local hospital having scanning & other ultra-modern medical facilities, which may be required/availed during emergency
2.9.2	Contractor has to ensure pre-employment medical check for all staff & workers.
2.9.3	Contractor has to ensure that adequate First Aid facilities with trained nurse are available at work site for emergency purpose. This emergency set-up should include, but not limited to, following : <ul style="list-style-type: none">➤ Oxygen set up➤ Breathing apparatus➤ Eye wash facility➤ Stretcher➤ Trauma blanket➤ Medicines. In addition to the above, contractor has to arrange ambulance at work site, whenever required in case of a medical emergency, for carrying affected person(s)

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	to the Medical Centre / Hospital.
2.10	The contractor shall comply with following towards Social Accountability:
2.10.1	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.
2.10.2	The contractor shall not engage Forced/ Bonded Labour and shall abide by abolition of Bonded Labour System (Abolition) Act, 1976.
2.10.3	The contractor shall maintain Health & safety requirement as stipulated in the Contract and Contract Labour (Regulation & Abolition) Act, 1970.
2.10.4	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.
2.10.5	The Contractor shall abide the requirement of Contract Labour (Regulation & Abolition) Act, 1970 for working hours.
2.10.6	The Contractor shall abide by the Statutory requirement of Minimum Wages Act 1948, payment of Wages Act 1936.
2.10.7	The Contractor shall arrange potable drinking water to its employees & workers.
2.11	Contractor shall ensure daily housekeeping and keep proper cleanliness of work place and do the disposal of wastes to certified area.
2.12	In addition to safety guidelines of GCC, contractor shall work as per customer safety rules and regulations also.

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Chapter-III: Facilities in the scope of Contractor/BHEL

3.0	FACILITIES TO BE PROVIDED BY BHEL/ CONTRACTOR			
S.No.	Description	Scope /to be taken care by		Remarks
		BHEL	BIDDER	
3.1	ESTABLISHMENT			
3.1.1	FOR CONSTRUCTION PURPOSE			
A.	Open space for office	YES		Limited space (free of charge) As and where made available by customer M/s NTPC
B.	Open space for storage	YES		Limited space(free of charge) As and where made available by customer M/s NTPC
3.1.2	FOR LABOUR COLONY			
A	Open space		YES	Contractor have to make their own arrangement
3.2	ELECTRICITY			
3.2.1.	Electricity for construction purposes (415 V) (chargeable/free)			Free of Cost
3.2.1.1	Single point source	YES		

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

3.2.1.2	Further distribution for the work to be done which include supply of materials & execution		YES	
3.2.2	Electricity for the office, stores, etc of the bidder which include:	YES		Free of cost
3.2.2.1	Distribution from single point including supply of materials & service		YES	
3.2.2.2	Supply, Installation & connection of material of energy meter including operation & maintenance		YES	
3.2.2.3	Electricity for living accommodation of the bidder's Staff, engineers, supervisors etc. on the above Lines		YES	Contractor have to make their own arrangement
3.2.2.4	Duties & deposits including statutory clearances for above		YES	
3.2.2.5	Demobilization of the facilities after completion of works		YES	
3.3	WATER SUPPLY			
3.3.1	FOR CONSTRUCTION:			
3.3.1.1	Making the water available at single point		YES	Contractor have to make bore wells itself, wherever approved by M/s NTPC
3.3.1.2	Further distribution as per the requirement of work including supply of materials & execution		YES	

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

3.3.2	LABOUR COLONY:			
3.3.2.1	Making the water available at single point		YES	Contractor have to arrange on his own.
3.3.2.2	Further distribution as per the requirement of work including supply of materials & execution		YES	
3.4	LIGHTING			
3.4.1	For construction work (supply of all materials) 1. At office storage area 2. At preassembly area 3. At construction site/area		YES	
3.4.2	For construction work (execution of lighting work/arrangements) 1. At office storage area 2. At preassembly area 3. At construction site/area		YES	
3.4.3	Providing the necessary consumables like bulbs, Switches, etc during the course of construction		YES	
3.5	Communications facilities for site operations of the bidder			
3.5.1	Telephone, fax , internet ,intranet, email etc.		YES	

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

3.6	COMPRESSED AIR SUPPLY			
3.6.1	Supply of compressor and all other equipments required for compressor and compressed air system including pipes, valves, storage systems etc		YES	
3.6.2	Installation of the above system operation and maintenance of the same.		YES	
3.6.3	Supply of the all the consumables for the above system during the contract period		YES	
3.7	ERECTION FACILITIES			
3.7.1	Providing erection drawings for all the Equipments covered under this scope	YES		
3.7.2	Drawings for construction method	YES	YES	
3.7.3	As-built-drawings-where ever deviations Observed & executed and also based on Decisions taken at site		YES	
3.7.4	Shipping lists etc for reference & planning the Activities	YES		
3.7.5	Preparation of site erection schedules and other input requirements		YES	
3.7.6	Review of performance & revision of site erection schedules in order to achieve the end dates & commitments	YES	YES	

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

3.7.7	Weekly erection schedule based on Sl. No.3.7.5		YES	
3.7.8	Daily erection/work plan based on Sl. No.3.7.7		YES	
3.7.9	Periodic visit of senior official of bidder to site to review the progress so that works are completed as per schedule. It is suggested this review by the senior official of the bidder should be done once in every two month		YES	
3.7.10	Preparation of preassembly bay		YES	
3.8	Notes:			
3.8.1	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.			
3.8.2	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.			
3.8.3	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.			
3.8.4	The contractor while drawing construction power supply from Distribution Board should strictly adhere to following points:			
3.8.4.1	All electrical installations should be as per Indian Electricity rules.			

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

3.8.4.2	All distribution Boards installed by the contractor should be constructed with fireproof materials viz. Steel frames, Bakelite sheets etc.
3.8.4.3	Connection for single phase should be taken from phase and neutral. Nowhere the connection should be taken with earth as neutral.
3.8.4.4	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.
3.8.4.5	Contractors have to make their own earthing arrangement for their equipment / DB earthing.
3.8.4.6	All electrical equipment / tools and plants should be properly earthed. DBs to be earthed diagonally opposite at two points.
3.8.4.7	Contractor should use "MCCB" and "ELCB" either on incoming or outgoing connections to the DBs.
3.8.4.8	Contractor should ensure that all the CBs / TPNs/ Fuses/ MCCB / ELCB cables etc. should be of adequate rating/ capacity.
3.8.4.9	For permission of supply connections contractor has to submit a test report of their installations with a single line diagram of connected/ proposed loads.
3.9	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.
3.10	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.
3.11	On completion of work or as and when required by BHEL, all the temporary buildings, structures, pipe lines, cables etc. shall be dismantled and leveled and debris shall be removed, as per instructions of BHEL, by the contractor at his cost. In the event of his failure to do so, the Engineer will get it done and expenses incurred shall be recovered from the contractor along with prevailing overheads. The decision of BHEL Engineer in this regard shall be final.
3.12	Compressor of required capacity for construction purposes shall be arranged by Contractor.

TECHNICAL CONDITIONS OF CONTRACT (TCC)
Chapter-IV: T&Ps and MMEs to be deployed by contractor

4.0 T&P AND MMD DEPLOYED BY CONTRACTOR				
SI No.	Item Description	Capacity	Qty	Duration
4.1	Crawler/Tyre mounted Crane	40T	2 No.	1 No. to be deployed from start of ESP erection work of Unit 1 & 1 No. to be deployed from start of ESP erection Unit 2. These cranes will be released after inlet/ outlet funnel erection for respective unit and on written undertaking by the party that whenever crane will be required after this period for work completion under this contract, party shall arrange the crane on case to case basis.
4.2	Hydra Crane	12 T / 14 T/18T	2 no	To be deployed from start of MM work
4.3	Hydra Crane	12 T / 14 T/18T	2 no	To be deployed from start of ESP erection work of Unit 1
4.4	Hydra Crane	12 T / 14 T/18T	2 no	APR
4.5	Trailer	15 T/ 20 T cap	1 no	To be deployed from start of MM work
4.6	Trailer	15 T/ 20 T cap	1 no	To be deployed from start of ESP erection work of Unit 1
4.7	Tractor trolley	APR	APR	APR
4.8	Winces of suitable capacity	2T/3T/5T/10T	APR**	APR
4.9	Hand Operated Megger 500 / 1000 V	APR	APR	APR

TECHNICAL CONDITIONS OF CONTRACT (TCC)
Chapter-IV: T&Ps and MMEs to be deployed by contractor

4.10	Tong Tester 10, 20 Or 50 Amp + / - 3 % Accuracy.	APR	APR	APR
4.11	Digital and Analogue Multimeters	APR	APR	APR
4.12	U Tube Manometer 0-2000 mm Water Column	APR	APR	APR
4.13	Inclined Manometer 0-50 mm Water Column	APR	APR	APR
4.14	Digital Clamp Meter (AC & DC type)	2000 Amp – 1000 Volt	1 No	APR
4.15	Alco meter for paint thickness checking	APR	APR	APR
4.16	Scaffolding Pipes with clamps	6 Meter Length	3000 Nos.	APR
4.17	Welding sets with accessories and ovens for welding electrodes backing and holding	APR	APR	APR
4.18	Air Compressor	140 CFM	01 No	APR
4.19	Chain pulley blocks and pulleys of suitable capacities		APR	APR
4.20	Three phase distribution board with complete set for distribution of construction power	400 Amps	APR	APR
4.21	Electric cables for distribution of		APR	APR

TECHNICAL CONDITIONS OF CONTRACT (TCC)
Chapter-IV: T&Ps and MMEs to be deployed by contractor

	construction power			
4.22	Precast reinforced concrete Sleepers Size (mm) 150X300X1200		1000 Nos	250 Nos within 1 month of LOI and remaining as per site requirement.
4.23	Tarpaulin		APR	APR
4.24	Safety Net		Minimum 25 Nos	APR
4.25	Rope Grab Fall Arrester and Karbiner		30 Nos	APR
4.26	Anchorage line (30 mtrs long) for fall arrester		10 Nos	APR
4.27	For horizontal life line – Wire rope (40 mtrs long)		20 Nos	APR
4.28	Torque Wrench		APR	APR
4.29	Oil filtration machine for transformer oil		APR	APR
	<p>**APR- As per requirement (Contractor shall have to deploy the T&P whenever required at site as decided by BHEL ENGINEER)</p> <p>*The date of start of contract period shall be the mutually agreed date between the contractor and BHEL engineer to start the work & this will be zero date for this contract. In case of discrepancy the decision of BHEL engineer is final.</p> <p>Deployment period of the T&P shall be as per initial/modified mutually agreed plan during course of execution.</p>			
4.30	<u>NOTES</u>			
4.30.1	The above major T & P list is indicative only and mobilization to be ensured as per project requirement as per front and material availability to maintain schedule of work in line with clause no. 2.9 of the GCC. Additional T & Ps if required, have to be			

TECHNICAL CONDITIONS OF CONTRACT (TCC)
Chapter-IV: T&Ps and MMEs to be deployed by contractor

	mobilized by the contractor within the quoted / accepted rate to sustain the desired progress of work. Contractor shall be responsible for adequate deployment of T & P as per site requirement for ensuring successful and timely execution of the work covered within the scope of their tender.
4.30.2	If works gets delayed due to non-availability of T&P and MMD, BHEL reserves the right to get work done at the risk & cost of contractor without prejudice to right of BHEL as in GCC.
4.30.3	Contractor must re-ascertain/ recheck range and accuracy of each IMTE from BHEL Engineer well in advance before arranging calibration/ deployment.
4.30.4	Other terms and conditions regarding above items shall be as per T&P clause in SCC.
4.30.5	Above T&P requirement are in general for this contract. All these T&P may be utilized in material management and erection testing work as per requirement.
4.30.6	In case the contractor does not deploy or delays deployment or major T&P with reference to schedule specified or T&P deployed is out of service for continuous more than 5 days, BHEL will recover non-refundable penalty per day in the following manner- In respect of each 40MT crane- @ Rs 4000/- per day In respect of each hydra 12MT/14MT/18MT- @ Rs 2000/- per day In respect of each trailer 15MT/20MT- @ Rs 1000/- per day
4.30.7	The manufacturing year of all major T&Ps deployed by the contractor (40MT crane, 12MT/14MT/18MT Hydra) should not be more than 10 years as on date of deployment. If at any moment of time during execution of work, any crane is found to be not in good condition and non-performing at desired minimum capacity, as certified by BHEL engineer, the contractor shall deploy another crane in good condition with minimum desired capacity. If contractor fails to deploy the same within 10 days, BHEL will recover non-refundable penalty per day of delay as per the rates given above.
4.30.8	For safety items like safety belts, fall arresters and safety net technical requirements are attached in annexure-II

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

5.0	T&Ps TO BE DEPLOYED BY BHEL			
Sl. No.	Description & Capacity of T & P	Capacity	Qty	Remark
5.1	Crawler Crane	135 T	1 No.	On sharing basis
5.2	Crawler / Tyre mounted Crane	100 T	2 Nos.	1 No. 100MT crane from start of contract and 1 no. as per project requirement
5.3	Air Blower	Suitable capacity	1 No.	
5.4	Huck Bolting Machine		6 No.	
5.5	NOTES:			
5.5.1	Cl.4.2.2.16 c.) of SCC shall read as 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 the responsibility of the contractor. If on checking it is found that the same is not followed, BHEL will exercise its right to get the job/works done at the risk and cost of contractor. BHEL may also provided cranes through crane hiring agencies in which case the day-to-day upkeep and running maintenance shall be excluded from scope of contractor. The contractor shall arrange fuel for the operation of hired & BHEL owned cranes.			
5.5.2	The operator of 100 MT & above cranes provided by BHEL, shall be arranged by BHEL free of cost. Diesel for the BHEL cranes will be supplied by the contractor. All other items shall be as per clause no. 4.2.2.16 of SCC.			
5.5.3	Above Cranes will be provided on specific instruction of the BHEL Engineer as per the work requirement			
5.5.4	Steel plates, if required will be provided by BHEL free of hire charges. However, compacting of land wherever required shall be done by Contractor.			
5.5.5	The contractor shall make necessary arrangement like laying of steel plates, assembly & dismantling of heavy lift attachment, boom, jib etc. for movement and operation of crane.			

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

5.5.6	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.
5.5.7	In case of other T&P mention above contractor shall transport from BHEL stores, install, operate, carry out maintenance, dismantle after use and return to BHEL stores.

TECHNICAL CONDITION OF CONTRACT (TCC)

Chapter-VI: Time schedule

6.0	TIME SCHEDULE												
6.1	The contractor is required to commence the work of material management within 15 days from the date of issue of letter of intent (LOI) .Erection testing and commissioning work will be started from 4 th month of start of work of this contract, unless BHEL decides to fix any other later date. However, BHEL Engineer will certify the actual date (zero date) of start of work after adequate mobilization of manpower, material handling equipment and other T&P by the contractor.												
6.2	The contract period for completion of entire work of Material Handling, Material Management and Erection testing and commissioning under this scope shall be 33 (thirty three) months from the “Start of contract period for material handling and materials management services” .												
6.3	The erection work shall be commenced on the mutually agreed date between the bidder and BHEL engineer and shall be deemed as completed in all respect only when the unit is in operation. The decision of BHEL in this regard shall be final and binding of the contractor. The scope of work under this contract is deemed to be completed only when so certified by the site Engineer.												
6.4	Contract Duration												
6.4.1	MM work as detailed in the tender specifications shall be completed within 33 MONTHS while erection, testing and commissioning work as detailed in the tender specifications shall be completed within 29 MONTHS from the start of erection date as per programme / milestones indicated by BHEL Engineer. Contractor has to mobilise adequate resources to meet BHEL’s commitments to their customer as indicated from time to time.												
6.4.2	<p>The various milestones dates to be achieved for ESP Work of U# 1, as per the current status of contract are as below:</p> <table style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="text-align: left;">MILE STONES</th> <th style="text-align: left;">MONTH</th> </tr> </thead> <tbody> <tr> <td>Start of MM work (Unit 1 & 2)</td> <td>Zero Date</td> </tr> <tr> <td>ESP Erection Start (Unit # 1)</td> <td>4th Month</td> </tr> <tr> <td>Compl. Of Erection & Comm for BLU (Unit # 1)</td> <td>20th Month</td> </tr> <tr> <td>Balance system for unit commissioning (Unit # 1)</td> <td>23rd Month</td> </tr> <tr> <td>Compl. Of Facilities (Unit # 1)</td> <td>27th Month</td> </tr> </tbody> </table> <p>All the above milestones for unit 2 shall have phase shift of 6 months from unit 1.</p>	MILE STONES	MONTH	Start of MM work (Unit 1 & 2)	Zero Date	ESP Erection Start (Unit # 1)	4 th Month	Compl. Of Erection & Comm for BLU (Unit # 1)	20 th Month	Balance system for unit commissioning (Unit # 1)	23 rd Month	Compl. Of Facilities (Unit # 1)	27 th Month
MILE STONES	MONTH												
Start of MM work (Unit 1 & 2)	Zero Date												
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Compl. Of Erection & Comm for BLU (Unit # 1)	20 th Month												
Balance system for unit commissioning (Unit # 1)	23 rd Month												
Compl. Of Facilities (Unit # 1)	27 th Month												

TECHNICAL CONDITION OF CONTRACT (TCC)

Chapter-VI: Time schedule

6.5	The contractor has to ensure that work is completed in all respects leaving no pending points. However the punch list/ pending points, which are possible to be attended at site, shall be fully liquidated within one month from successful completion of Facilities.
6.6	The work under the scope of this contract is deemed to be complete in all respects only when the contractor has discharged all the responsibilities laid down in contract. The decision of BHEL on completion date shall be final and binding on contractor.

TECHNICAL CONDITION OF CONTRACT (TCC)

Chapter-VII: Terms of payment

7.0	TERMS OF PAYMENT	
7.1	The 'Engineer' will certify regarding the actual work executed in the measurement books and bills, which shall be accepted by the contractor in measurement book.	
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 that BHEL may be authorised to make under the contract, the contractor on the certificate of the Engineer at site be entitled for payment as explained hereunder.	
7.4	Interest bearing recoverable advance: Applicable as per Clause No. 2.13 of GCC.	
7.4	TERMS OF PAYMENT FOR MM WORK	
7.4.1	Payment allocated as per 12.2.1 for MM unloading work per MT will be further divided as under-	
SL No	Description of activity	% of payment
7.4.1.1	UNLOADING, SHIFTING TO OPEN/ COVERED STORES FROM TRUCKS/ TRAILERS/ RAILWAY WAGONS/ TRANSPORTER GODOWN	45%
7.4.1.2	STACKING AND VERIFICATION	15 %
7.4.1.3	UPDATION OF VERIFICATION DETAILS IN MATERIAL STOCK REGISTERS/ MM PACKAGE , SUBMISSION OF REPORTS AS PER SPECIFIED FORMATS FOR SHORTAGE/OPEN DELIVERY, LODGING OF POLICE REPORTS IF REQUIRED, DOCUMENTS FOR INSURANCE CLAIMS ETC, AND PREPARATION OF MATERIAL RECEIPT CERTIFICATES IN PRESCRIBED FORMATS WHERE EVER APPLICABLE	25 %
7.4.1.4	IDENTIFICATION OF MATERIAL IN READY TO LIFT POSITION FOR ISSUE TO BHEL/ERECTION AGENCY, AND UPDATION OF ISSUE DETAILS IN STORES RECORDS	12%

TECHNICAL CONDITION OF CONTRACT (TCC)

Chapter-VII: Terms of payment

7.4.1.5	COMPLETION OF CONTRACTUAL OBLIGATIONS	3%
7.4.2	Payment allocated as per 12.2.1 for MM re-shifting work (as per clause 2.2.2.16) per MT will be further divided as under-	
SL No	Description of activity	% of payment
7.4.2.1	MATERIAL RE-SHIFTING/ RE-STACKING	85%
7.4.2.2	UPDATION IN STORE MATERIAL REGISTERS/BHEL MM PACKAGE SYSTEM	12%
7.4.2.3	COMPLETION OF CONTRACTUAL OBLIGATIONS	3%
7.5	PROGRESSIVE PAYMENT ON PRORATA BASIS (ETC of ESP SERVICE PORTION) ITEM No. 12.2.2 of Rate schedule will be paid as under-	
7.5.1	85 % of unit rates (Applicable for ITEM. No. 12.2.2 of Rate Schedule)	
7.5.1.1	COMPLETION OF PRE-ASSEMBLY, (IF NOT APPLICABLE THIS PORTION SHALL BE CLUBBED WITH PLACEMENT IN POSITION)	15%
7.5.1.2	PLACEMENT IN POSITION	20%
7.5.1.3	ALIGNMENT	15%
7.5.1.4	WELDING /BOLTING/FIXING AS REQUIRED	20%
7.5.1.5	COMPLETION OF HOPPERS ALONG WITH ALL DOORS, HEATING ELEMENTS, POKING DOORS, ETC	5 %
7.5.1.6	COMPLETION OF INNER, OUTER ROOF INSULATOR HOUSING, RECTIFIER TRANSFORMERS, PENT HOUSE MONO RAILS, HOISTS ETC	5 %
7.5.1.7	ERECTION OF EMITTING AND COLLECTING RAPPING SYSTEM WITH ALL DRIVES	5 %
7.5.1.8	TOTAL FOR PRO RATA PAYMENTS	85%
	FOR STAGE/ MILESTONE PAYMENTS (15%) (Applicable for ITEM. No. 12.2.2 of Rate Schedule)	
7.5.2.1	Air & Gas Tightness Test	1 %
7.5.2.2	Gas Distribution Test	1 %

TECHNICAL CONDITION OF CONTRACT (TCC)

Chapter-VII: Terms of payment

7.5.2.3	Charging of ESP Fields	4 %
7.5.2.4	Coal Firing	2%
7.5.2.5	Full Load	-
7.5.2.6	Trial operation of Unit	1%
7.5.2.7	Completion of all drains and vents to respective locations and placement of instrument sensors after steam blowing	-
7.5.2.8	Painting	2%
7.5.2.9	Area cleaning, temporary structures cutting/ removal and return of scrap	1%
7.5.2.10	Punch list point/ pending points liquidation	1%
7.5.2.11	Material Reconciliation	1%
7.5.2.12	Completion of contractual obligations	1%
7.5.2.13	TOTAL FOR STAGE/ MILESTONE PAYMENTS (15%)	15%
7.6	PAYMENT FOR SUPPLY PORTION (Applicable for ITEM. No. 12.2.3 of Rate Schedule)	
7.6.1	100% payment after completion of finish painting as certified by BHEL Engineer.	
7.7	Further breakup of milestone activities may be decided at site as per BHEL construction Manager.	

TECHNICAL CONDITION OF CONTRACT (TCC)
Chapter-VIII: TAXES & DUTIES

8.0	TAXES & DUTIES (SERVICE PORTION-ESP)
8.1	<p>The contractor shall pay all (save the specific exclusions as enumerated in this contract) taxes, fees, license charges, deposits, duties, tools, royalty, commissions or other charges which may be levied on the input goods & services consumed and output goods & services delivered in course of his operations in executing the contract. In case BHEL is forced to pay any of such taxes, BHEL shall have the right to recover the same from his bills or otherwise as deemed fit.</p> <p>However, provisions regarding Service Tax and Value Added Tax (VAT) on output services and goods shall be as per following clauses.</p>
8.2	Service Tax & Swachh Bharat Cess
8.2.1	<p>Service Tax and Swachh Bharat Cess as applicable on output Services are excluded from contractor's scope; therefore contractor's price/rates shall be exclusive of Service Tax and Swachh Bharat Cess.</p> <p><u>The bid process should be exclusive of Swachh Bharat Cess.</u></p> <p><u>The service invoice on output services should show the SBC amount separately.</u></p> <p><u>The documentary evidence of deposition of service tax and SBC is to be submitted.</u></p>
8.2.2	<p>Contractor shall obtain prior written consent of BHEL before billing the amount towards such taxes. The Service Tax Rules permit more than one option or methodology for discharging the liability of tax/levy/duty and BHEL will have the right to adopt the appropriate one considering the amount of tax liability on BHEL/Client 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. Contractor shall submit to BHEL documentary evidence of Service Tax registration certificate specifying name of services covered under this contract.</p>
8.2.3	For the purpose of claiming any Service Tax from BHEL, the following procedure shall be adopted :
8.2.3.1	<p>Contractor shall submit serially numbered Service Tax and Cess Invoices, signed by him or a person authorized by him in respect of taxable service provided, and shall contain the following, namely:</p>
8.2.3.1 .1	The name, address and registration number of the contractor

TECHNICAL CONDITION OF CONTRACT (TCC)

Chapter-VIII: TAXES & DUTIES

8.2.3.1 .2	The name and address of the party receiving taxable service (BHEL)
8.2.3.1 .3	Description, classification and value of taxable service provided and
8.2.3.1 .4	The Service Tax and Swachh Bharat Cess payable thereon.
8.2.4	All the four conditions shall be fulfilled in the invoice for payment of Service Tax and SBC by BHEL. Where more than one nature of Service under Service Tax Rules is involved, the invoice mentioned above shall contain the break up of all values for each nature of Service.
8.2.5	Name and address of the Contractor should be same in the service tax invoice and monthly bill. Any change in the name and address in past should be supported by documentary evidence duly certified by the registering authority.
8.2.6	<p>Purpose of above requirements, inter-alia, is to enable availment of Cenvat credit by BHEL. As per recent amendments, Time restrictions for taking Cenvat credit is within six months from date of invoice.</p> <p>Wherever Cenvat credit could not be availed by BHEL within statutory time limit of 6 months due to delay in submission of invoices or for any other reasons attributable to contractors, Liability towards loss of such Cenvat credit shall be passed on to contractors.</p>
8.3	Modalities of Tax Incidence on BHEL
8.3.1	Wherever the relevant tax laws permit more than one option or methodology for discharging the liability of tax/levy/duty, BHEL will have the right to adopt the appropriate one considering the amount of tax liability on BHEL/Client 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.
8.4	New Taxes/Levies
8.4.1	In case the Government imposes any new levy/tax on the output service/goods/work after award of the contract, the same shall be reimbursed by BHEL at actual.
8.4.2	In case any new tax/levy/duty etc. becomes applicable after the date of Bidder's offer, the Bidder/Contractor must convey its impact on his price duly substantiated by documentary evidence in support of the same before opening of Price Bid. Claim for any such impact after opening the Price Bid will not be considered by BHEL for

TECHNICAL CONDITION OF CONTRACT (TCC)

Chapter-VIII: TAXES & DUTIES

	reimbursement of tax or reassessment of offer.
8.4.3	No reimbursement/recovery on account of increase/reduction in the rate of taxes, levies, duties etc. on input goods/services/work shall be made. Such impact shall be taken care of by the Price Variation/Adjustment Clause (PVC) if any. In case PVC is not applicable for the contract, Bidder has to make his own assessment of the impact of future variation if any, in rates of taxes/duties/ levies etc. in his price bid.
8.5	TAXES & DUTIES (SUPPLY PORTION)
8.5.1	Price quoted should be inclusive of all the applicable charges, taxes and duties, including entry tax. However rates of sales tax, excise duty & other statutory levies should be indicated separately. Variation in excise duty, sales tax/ vat or any other statutory levies during contractual delivery period should be to BHEL's account. BHEL shall issue 'C' form against submission of E1 forms by suppliers for supply of material from outside the state and the road permits shall be issued by the customer, as the material shall be consigned to the ultimate customer. In case of material purchased within the state, vat shall be payable on submission of vat invoices and documentary evidence towards deposit of vat by the vendor.
8.5.2	Contractor shall get his organisation registered with concerned Sales tax/ VAT authorities within 15 days of award of this contract and forward the same to BHEL. The delay on this account and delay in bringing the material shall be to contractors account and no extension of time shall be allowed on this account. In case the contractor is already registered for Sales tax/ VAT with Govt. Authorities, the same must quote his registration no. While submitting their tender.

TECHNICAL CONDITION OF CONTRACT (TCC)

Chapter-IX: Any other requirement

9.0	Any other requirement
9.1	NA

TECHNICAL CONDITION OF CONTRACT (TCC)

Chapter-X: Others

10.0	IMPORTANT CONDITIONS
10.1	In the event of any ambiguity or conflict between the Tender Documents, the order of precedence shall be as mentioned in Notice inviting tender.
10.2	Modification/ deletion in Price Variation Compensation Clause no. 2.17 of GCC:
10.2.1	Clause No. 2.17.5 of GCC shall be modified as below:- Base date shall be the calendar month of the schedule completion date of the contract. Schedule Completion date shall be the actual start date plus delivery period as defined in clause no 6.0 of TCC (Part-I)
10.2.2	Clause No. 2.17.9 shall be modified as:- PVC shall be applicable only for the extended period of contract (if any) after the schedule completion date. However, the total Quantum of Price Variation amount payable/recoverable shall be regulated as follows:
10.2.2.1	For the portion of backlog attributable to the contractor, no PVC shall be paid.
10.2.2.2	For the period of Force Majeure, the PVC (if applicable) will be limited to the indices applicable at the beginning of the force majeure period.
10.2.2.3	For the portion of backlog attributable to BHEL, the PVC will be as per the indices applicable for the respective months
10.2.2.4	The total amount of PVC shall not exceed 15% of the cumulatively executed contract value. Executed contract value for this purpose is exclusive of PVC, ORC, Supplementary/Additional Items and Extra works.
10.3	All other terms & conditions of Clause No. 2.17 of GCC shall remain same.
10.4	Guarantee Period will start from the date of acceptance of the trial operation of the Unit by BHEL/NTPC. Other conditions shall be as per Clause No. 2.24 of GCC

TECHNICAL CONDITION OF CONTRACT (TCC)
Chapter-XI: Annexures

Annexure-I

TENTATIVE WEIGHT SCHEDULE FOR ERECTION TESTING AND COMMISSIOING

SUMMARY OF WEIGHTS (ESP U1 & U2)

SN	Description	Wt	Unit	Annexure
1	ESP Material for Unit No. 1	10231	MT	IA
2	ESP Material for Unit No. 2	10231	MT	IB
3	Transformer Sets (For Unit No.1 & 2)	476	MT	IC
	Total Weight (in MT)	20938	MT	

TENTATIVE WEIGHT SCHEDULE FOR MATERIAL MANAGEMENT

SN	Description	Wt	Unit
1	ESP Material for Unit No. 1 & 2	21500	MT
2	Re-shifting of material	1500	MT
	Total Weight (in MT)	23000	MT

TECHNICAL CONDITION OF CONTRACT (TCC)
Chapter-XI: Annexures

Annexure- IA

Product Group (PG) Wise Weight Schedule for ESP Unit-I

SNO	PGMA	Description	Estimate Wt (in Kg)
1	79601	ROLL/SLIDE SUPPORTS	36000
2	79643	HOPPER RIDGES	99000
3	79648	CASING STRUCTURE	550000
4	79649	CASING SHELL/PANEL	815000
5	79680	FOUNDATION MATLS FOR ESP	17643
6	79681	SUPPOTING STRUCTURES FOR ESP	984350
7	89610	EP GALLERIES&STAIRS	104000
8	89612	FLOOR GRILL AND STEP TREAD	90000
9	79608	GAS DIST. ASSY	85000
10	79613	EMIT SYST SUSPENSION	29900
11	79614	SUPPORT INSULATORS	29000
12	79619	COL ELEC SUSPENSION	184000
13	79620	COLLECTING ELECTRODE	1715000
14	79621	EMIT SYS FRAME-TOP	167500
15	79622	EMIT SYS FRAME BOTOM	220000
16	79628	ESP ROOF BEAM	345000
17	79632	EMIT SYS FRAME-MIDLE	290000
18	79646	INSULATOR SUPP PANEL	150000
19	79647	ROOF PANEL ASSY	201000
20	79611	GAS SCREEN-EP	80000

TECHNICAL CONDITION OF CONTRACT (TCC)

Chapter-XI: Annexures

21	79615	EMITTING ELECTRODES	37940
22	79624	SHOCK BARS	140000
23	79625	COLL ELECT RAPP MECH	131000
24	79642	OUTER ROOF-EP	362000
25	79644	HOPPER UPPER PART	387000
26	79645	HOP MLD&LOWER PART	697000
27	79650	INLET-OUTLET FUNNEL	222000
28	79657	SPLITTER&GUIDE VANES	40000
29	79606	INSULATOR HOUSING AS	93500
30	79609	GD-RAPPING MECHANISM	16000
31	79610	GD_DRIVE ARRANGEMENT	1400
32	79616	EMIT ELECT RAPP MECH	53000
33	79617	DRIVE ARGT. FOR EMIT. SYS	56500
34	79623	INSPECTION DOORS	22200
35	79626	COLL ELEC RAPP DRIVE	12400
36	79655	PENT HOUSE FOR E P	242360
37	79665	APP PLATFORM-HOPPER	125000
38	89613	FLOOR GRILL AND MOBILE LADDER	82000
39	89614	PENT HOUSE ROOFING SHEETS	50000
40	79605	ESP-SUB-DELIVERY COMPONENTS	1000
41	79630	ELECTRICAL SD COMPTS	33100
42	79631	GEARED MOTORS FOR RAPPING MECH	40500
43	79637	JUNCTION BOX & PUSH BUTTON STA	2500
44	79659	SUPPORTS FOR ELECTRICAL ITEMS	34700
45	79660	CABLE-CABLE RACKS	250000

TECHNICAL CONDITION OF CONTRACT (TCC)

Chapter-XI: Annexures

46	79661	EP PERF TEST EQUIPT	24700
47	79662	CABLE TRAY AND FLEXIBLE SUPPTS	169100
48	79663	ASH LEVEL INDICATOR	1200
49	79666	WATER WASHING SYSTEM	6000
50	79672	INTERLOCKS-EP	2000
51	79673	ELECTRICALLY OPERTD HOIST&ACCE	9400
52	79674	OPACITY MONITOR & ACCESSORIES	1000
53	79678	BAPCON & ACCESSORIES	1700
54	79690	HEATING ELEMENTS	1500
55	79691	PANEL TYPE HOPPER HEATERS & AC	25000
56	79692	MARSHALLING CABINET	3000
57	79695	IOS PANEL	300
58	79641	ELECTRICAL MISCELLANEOUS ITEMS	38000
59	79664	MISCELLANEOUS ITEMS	10000
60	79667	MIN WOOL FOR ESP INSULATION	405000
61	79668	FIXING COMP. FOR ESP INSULATIN	95000
62	79996	TOOLS & TACKLES	200
63	89611	ESP ROOF HANDRAILS	13500
64	89615	INSULATION CLADDING SH FOR ESP	92750
65	89616	PASNGR ELEVTR FOR EP CTRL ROOM	5000
66	79988	COMMISSIONING SPARES	800
		TOTAL WEIGHT (IN KG)	10230643
		TOTAL WEIGHT (IN MT)	10231

TECHNICAL CONDITION OF CONTRACT (TCC)
Chapter-XI: Annexures

Annexure-IB

Product Group (PG) Wise Weight Schedule for ESP Unit-II

SNO	PGMA	Description	Estimate Wt (in Kg)
1	79601	ROLL/SLIDE SUPPORTS	36000
2	79643	HOPPER RIDGES	99000
3	79648	CASING STRUCTURE	550000
4	79649	CASING SHELL/PANEL	815000
5	79680	FOUNDATION MATLS FOR ESP	17643
6	79681	SUPPOTING STRUCTURES FOR ESP	984350
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TECHNICAL CONDITION OF CONTRACT (TCC)

Chapter-XI: Annexures

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TECHNICAL CONDITION OF CONTRACT (TCC)

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64	89615	INSULATION CLADDING SH FOR ESP	92750
65	89616	PASNGR ELEVTR FOR EP CTRL ROOM	5000
66	79988	COMMISSIONING SPARES	800
		TOTAL WEIGHT (IN KG)	10230643
		TOTAL WEIGHT (IN MT)	10231

TECHNICAL CONDITION OF CONTRACT (TCC)
Chapter-XI: Annexures

Annexure-IC

Transformer Sets to be supplied from BHEL-Jhansi Unit

PGMA	Description	Qty	Estimate Wt (in MT)
-	TRANSFORMER SET (EACH WEIGHING 2.2 MT) FOR U#1 & 2	216	476
	TOTAL WEIGHT (IN MT)		476

ESP Transformer, Electronic Control Panels will be supply by Jhansi and the same to be erected and is part of the Scope.

Note:

1. Painting and insulation shall be in the scope of this contract.
2. Approx. weight to be erected for ESP shall be **20,938 MT** as indicated in Annexure-I for installation as per the scope mentioned in the tender specification. 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.
3. The contractor has to erect/install all the equipments/items supplied by manufacturing units/ Engineering centers for the respective package of ESP to make the system complete in all the respect eventhough if items not covered in the scope of work of the contract.
4. The PG MA list as given above is only tentative & indicative. The scope shall include all the PGMA's/ Material issued by BHEL for completing the system. BHEL Engineer's decision in this regard shall be final.

TECHNICAL CONDITION OF CONTRACT (TCC)
Chapter-XI: Annexures

Annexure-IIA

SAFETY BELT WITH FULL BODY HARNESS

COMPLIANCE WITH STANDARDS

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

TECHNICAL REQUIREMENT

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

MARKING

The Safety belt shall be marked with the following information

- a) Relevant ISI, EN, ANSI marks
- b) Supplier identity
- c) Month & year of manufacturing

TECHNICAL CONDITION OF CONTRACT (TCC)
Chapter-XI: Annexures

Annexure-IIB

ROPE GRAB FALL ARRESTER

COMPLIANCE WITH STANDARDS

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

TECHNICAL REQUIREMENT

- a) The design of fall arrester should be such that it can be conveniently clasped on to an anchorage line so as to accompany the user without requiring manual adjustments during upward or downward movements.
- b) The Fall Arrester should work on minimum 14 mm diameter, polyamide rope as anchorage line (main line).
- c) The Fall Arrester shall be made from Stainless Steel and the design of the same must conform to relevant Indian standard (IS code) or equivalent to EN 353-2: 2002.
- d) The Fall Arrester should have steel karabiner as attachment and gravity locking to prevent incorrect use and should have double security opening system as per the relevant IS code or equivalent to EN 353-2: 2002.

MARKING

The Fall Arrester shall be marked with the following information

- a) Relevant ISI, EN, ANSI marks
- b) Supplier identity
- c) Month & year of manufacturing

TECHNICAL CONDITION OF CONTRACT (TCC)
Chapter-XI: Annexures

Annexure-II C

INDUSTRIAL SAFETY NET

COMPLIANCE WITH STANDARDS

It shall comply with IS: 11057 - 1984.

TECHNICAL REQUIREMENT

- a) The net shall be made from manmade fibre ropes and plaited cord, with the exception of polyethylene ropes and cords and confirming the Basic Design as per the clause 3 of IS:11057-1984.
- b) The nominal size of the net should be 6 M X 4 M in length and width respectively. For other dimensions Net should confirm clause 4 & 5 of IS:11057-1984.
- c) The performance of safety nets shall be tested as per clause 6 and Appendix "A" of IS:11057-1984.
- d) Marking should be as per clause 7 of IS:11057-1984. Each net shall be provided with soft, flexible, permanent labels of textile or plastic material at two different positions and marked with indelible ink in letter of 3 cm in height.

MARKING

The Industrial Safety Net shall be marked with the following information

- a) Relevant ISI, EN, ANSI marks
- b) Supplier identity
- c) Month & year of manufacturing

TECHNICAL CONDITION OF CONTRACT (TCC)

Chapter-XII: Rate Schedule

ANNEXURE-A

12.0	<u>RATE SCHEDULE (UNPRICED)</u>	
Item No.	DESCRIPTION OF WORK	Total Value In Rupees A (In figures and words)
12.1	Total Lumpsum price for entire scope of material handling, erection, testing, commissioning, trial operation and handing over of Electrostatic Precipitators of Unit No.1 & 2 at 2x660 MW, NTPC Tanda including auxiliaries, insulation, electrical, control and instrumentation etc & final painting including Supply of paints as per tender specification. (Approx. tonnage involved is 20938 MT)	

TECHNICAL CONDITION OF CONTRACT (TCC)

Chapter-XII: Rate Schedule

12.2	<u>PRICE BREAKUP FOR MATERIAL MANAGEMENT AND ETC WORK</u>		
Item No.	DESCRIPTION OF WORK	QTY	Rate/MT In Rupees
12.2.1	Rate/ MT of material handling of Electrostatic Precipitators of Unit No.1 & 2 at 2x660 MW, NTPC Tanda	23000 MT	<u>AX 3.33</u> (23000X100)
12.2.2	Rate/MT of erection , testing , commissioning and handing over of Electrostatic Precipitators of Unit No.1 & 2 at 2x660 MW, NTPC Tanda	20938 MT	<u>AX 95.67</u> (20938 X100)
12.2.3	Supply of paints , primers etc	Lumpsum (for entire scope of supply portion work)	<u>AX 1</u> 100
12.3	Note:		
12.3.1	Separate orders shall be issued for Service portion (ESP) and Supply portion (paints).		
12.3.2	The quantities indicated above are tentative and are liable to vary depending upon the site requirement. Payment shall be made on prorated basis (except for supply portion) for actual executed quantities. The contractor has to supply / erect / commission all the items indicated by BHEL for achieving the milestones and completion of work.		
12.3.3	Evaluation of bids shall be done on total price against this Rate Schedule		
12.3.4	In case of any mismatch in Rate and amount on Price discrepancy, the same will be dealt as per clause No. 1.4 of GCC.		

TECHNICAL CONDITION OF CONTRACT (TCC)

TECHNICAL CONDITION OF CONTRACT (TCC)

TENDER NO. BHEL/ NR/SCT/TANDA /ESP /1012

FOR

**MATERIAL MANAGEMENT AND ERECTION, TESTING, COMMISSIONING, TRIAL
OPERATION & HANDING OVER OF ELECTROSTATIC PRECIPITATOR (ESP) OF
UNIT NO.1 & 2 AT 2X660 MW, TANDA STPS OF NTPC, TANDA.**

PART-II OF TCC



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

TECHNICAL CONDITION OF CONTRACT (TCC)

SI	DESCRIPTION	Chapter No.	PAGES
	Part-II: Technical Specifications		
1.	GENERAL	Chapter-I	
2.	CIVIL WORKS, FOUNDATION, GROUTING	Chapter-II	
3.	ERECTION	Chapter-III	
4.	WELDING, HEAT-TREATMENT, RADIOGRAPHY AND NDT	Chapter-IV	
5.	APPLICATION OF INSULATION	Chapter-V	
6.	PAINTING INCLUDING FINISH PAINTING	Chapter-VI	
7.	TESTING, PRE-COMMISSIONING, COMMISSIONING, AND POST-COMMISSIONING	Chapter-VII	

TECHNICAL CONDITION OF CONTRACT (TCC)

Chapter-I: General

1.0	GENERAL
1.1	The intent of this specification is to provide services for execution of the 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/ lumpsum price shall deem to be inclusive of all such contingencies.
1.2	The contractor shall carry out the work in accordance with standard practices/ codes/ instructions/ drawings/ documents/ specification supplied by BHEL from time to time.
1.3	The work shall conform to dimensions and tolerances given in various drawings and documents that will be provided during erection. 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.
1.4	Following shall be the responsibility of contractor and have to be provided within finally accepted rates/ prices:
1.4.1	Provision, as required, of all types of labour, supervisors, engineers, watch and ward, tools & tackles, calibrated inspection, measuring and testing equipment as specified and otherwise required for the work, consumables for erection, testing and commissioning including material handling.
1.4.2	Proper out-turn as per BHEL plan and commitment.
1.4.3	Completion of work as per BHEL Schedule.
1.4.4	Good quality and accurate workmanship for proper performance of the equipment.
1.4.5	Repair and rectification.
1.4.6	Preservation/ Re-conservation of all components during storage/ erection/ commissioning till handing over.
1.5	BHEL-Power Sector (NR) is ISO 9001-2000, ISO 14001-1996 and OHSAS 18001-1999 certified company. Quality of work, to customer's satisfaction and system requirements are the essence of these certifications. The contractor in all respects will organize his work, systems, environment, process control documentation, tools, plant, inspection, measuring and testing equipment etc. as per instructions of BHEL engineer.

TECHNICAL CONDITION OF CONTRACT (TCC)
Chapter-II: Civil Works, Foundation & Grouting

2.0	CIVIL WORKS, FOUNDATION, GROUTING
2.1	BHEL/NTPC shall provide all equipment foundations. For the correctness of these foundations 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 50 mm, enlarging the pockets in foundations etc., as may be required for the erection of equipment / plants shall be carried out by the contractor.
2.2	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 packing plates as per requirements provided BHEL Engineer allows it. When required by manufacturers, the embedded sub-sole plates shall be scraped and checked with prussian blue to get the required contact with frames.
2.3	The contractor shall ensure perfect matching of packer plates including machining, scraping and blue matching with foundation by dressing the foundation, as well as perfect matching between the packer plates and the base plate of equipment to the satisfaction of BHEL Engineer. If required the packer plates may have to 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 20 mm. The material required for this has to be arranged for by the contractor at his cost.
2.4	Complete grouting of structures equipments, including anchor / foundation bolts, beneath base, base hollows etc. as may be applicable, is included in the scope of contractor. Arranging all labour, building materials including cement as applicable (ordinary Portland as well as Quick setting – free flow).
2.4.1	Non-shrink grout mix (e.g. shrink comp , conbextra etc)), form work, shuttering, and any other requirements is in the contractor’s scope. Contractor shall obtain approval of BHEL for applicable cement (ordinary as well as quick setting – free flow Non-shrink grout mix) prior to procurement and use.
2.5	Cleaning of foundation surfaces, pocket holes and anchor bolt pits and de-watering and making them free of oil, grease, sand another foreign materials by soda washing, water washing, compressed air and other approved methods, are within the scope of this specification / work.
2.6	The contractor shall arrange for sand, stone chips, gravels, anti shrink compound, plasticizer, shuttering, grout mixing machine, labors etc at his cost. The contractor shall prepare the required test pieces/test cubes to ensure the strength of grout and get the same tested in laboratory at his cost. Test cube shall also be taken during grouting for testing in the laboratory and shall be tested at his cost. All necessary arrangement along with watering till complete curing has to be arranged by the vendor After the grouting has finally set and cured, alignment of equipments involved shall be checked again to verify for any disturbance or any other reason.

TECHNICAL CONDITION OF CONTRACT (TCC)
Chapter-II: Civil Works, Foundation & Grouting

2.7	If required, decoupling of equipments has to be done for conducting the verification. In case any disturbance is noticed the cause, if any, shall be removed and re-alignment done as part of work.
2.8	The contractor shall check and verify the alignment of equipment. The Grouting of all the equipments will have to be carried out by the Contractor. The contractor has to arrange for all materials required for carrying out the grouting including supply of the Special Grout as indicated in the drawings and as approved by the Engineer.
2.9	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.
2.10	Contractor shall check and verify the alignment of equipment, alignment of shafts of rotating machinery, the slopes of all bearing pedestals, centering of rotors with respect to their sealing bores, couplings etc. as applicable and the like items to ensure that no displacement had taken place during grouting. The values recorded prior to grouting shall be used during post grouting check up and verifications. Such pre and post grout records of alignment details shall be maintained by the contractor in a manner acceptable to the Engineer.
2.11	Besides grouting as above, any civil works required for safe and efficient operation of tools and tackles like grouting / excavation/ casting of foundation / anchor points for derricks, winches, guy ropes fastening, etc / foundations required for chemical cleaning pumps, tanks and any other temporary supports shall also be the contractor's responsibility. For these civil works all materials including cement and required facilities will have to be arranged by contractor at his own cost.

TECHNICAL CONDITION OF CONTRACT (TCC)

Chapter-III: Erection

3.0	ERECTION
3.1	Wherever called for, pre-assembly of supporting structures, casing walls, inlet outlet funnels, hoppers etc have to be done, on ground prior to erection in position.
3.2	All site weld for casing, inlet & outlet ducting connections have to be tested for establishing leak proof joints.
3.3	Loading of collecting electrodes either from top or bottom, to be decided suiting site conditions, shall be done with due care as per instructions.
3.4	Straightness of all collecting electrodes has to be checked on ground prior to loading in to the field.
3.5	Bundle of collecting electrodes should be handled only with special lifting beam and slings supplied for the purpose.
3.6	BHEL will supply Huck bolting M/c with necessary auxiliaries free of charges. However, electrical connections, operation etc shall be arranged by the Contractor.
3.7	Clearances as prescribed amongst collecting electrodes and with casing walls have to be maintained. Spot heating of collecting electrodes, wherever called for, shall be done as part of work to achieve the required clearances.
3.8	Erection, alignment/ fixing in final position, testing & commissioning of high voltage rectifiers of ESP is in the scope of work. Filtration of Transformer Oil is in the Scope of Work if required.
3.9	Installation of high voltage interlocks is in the scope of work.
3.10	Complete erection, alignment, testing, pre-commissioning and commission etc for drive motors of collecting electrodes and emitting electrode rapping mechanism is in the scope of work.
3.11	AIR LEAK TEST After erection of ESP and before clearing for insulation, air leak test has to be carried out. BHEL shall provide air blower free of charge for this purpose. All other arrangements, handling at stores, transport, and erection, commissioning and carrying out the leakage test, attending to the leakages till satisfactory sealing / leak proofness shall be in scope of the work. Contractor shall dismantle the test equipments and return to BHEL stores in good condition after due reconciliation, cleaning and servicing. No separate/ additional payment is envisaged for the above.
3.12	MAIN SUPPORTING STRUCTURES, EXTERNAL STRUCTURES, ELEVATOR

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	STRUCTURES, STAIRWAYS, GALLERIES & PLATFORMS & HANDLING ARRANGEMENT
3.13	Quality norms with regard to verticality of column have to be adhered to strictly, at various stages of erection.
3.14	Stiffening / strengthening of main supporting structure, if any, due to deviation in verticality of columns, shall be carried out, including fabrication, if any. Necessary steel for this will be provided in random sizes by BHEL as free issue. Payment for such stiffening/ strengthening shall be made for weight certified by BHEL engineer at the item rate applicable to structures, provided the deviation has occurred for the reasons not attributable to the Contractor. If the deviations are attributable to Contractor, the materials required for Rectification / Stiffening / Strengthening, fabrication, erection of the same shall be to the Contractors account.
3.15	<p>It is likely that, in deviation from prescribed sequence, erection of certain elements of structure may be deferred for later stage, this may necessitate temporary installation of some structural steels at appropriate locations to keep the stability of structure intact. Such temporary installations shall be removed subsequently and returned to BHEL stores/ storage yard. Finishing work in the related permanent structures shall be done as per the instruction of BHEL engineer. BHEL will provide necessary steels on free issue basis in random sizes for such installations, which shall be fabricated by the Contractor to suit the requirement.</p> <p>Payment for such installations shall be made on the accepted tonnage rate of structures. No separate payment will be made for fabrication, removal & return of the materials to BHEL stores.</p>
3.16	In some cases, the structural material will be supplied in random lengths, which have to be fabricated to suit the requirement as incidental to work. Also, it may sometimes be necessary to remove some of the erected members to facilitate erection of bigger/ pre-assembled equipments. In such cases, the removal and re-erection of such members as agreed by the BHEL Engineer will have to be done by the Contractor as incidental to work.
3.17	Contractor shall arrange materials required for temporary cat ladders & working platforms during erection of columns, platforms and other structural components. Such arrangements shall, as far as possible, be only of clamping & bolting type, as welding on columns etc will not be permitted. After the completion of work these shall be removed.
3.18	All the hand rails and toe guards shall be provided as per drawings and site requirement. Hand rails supplied in running lengths shall be suitably cut, edge prepared and welded. Also, hand rails/ guards may have to be provided from the

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	safety point of view in certain places though not indicated in the erection drawings. The weld joints of hand rails shall be ground smooth to flush finish.
3.19	The Contractor shall also install additional platforms of permanent nature for approaching different equipment as per the site requirement and to meet O&M requirements, though these may not indicated in the erection drawings. Materials required for such platforms will be supplied by BHEL in random sizes on free issue basis. These have to be fabricated to suit the requirement. Payment only for erected weight as certified by BHEL engineer shall be made at the rate applicable for structures. No payment is envisaged for fabrication of structures.
3.20	Electrical & C&I works
3.20.1	Erection and Commissioning of all electrical and C&I Supplied items of ESP in the scope of supply of BHEL Units for this project like control room inserts, cables, earthing, cable trays, junction box, heating elements, interlocks, auxiliary control panel, rapper control panel, statcon panel, LT switch board, ESP switch gear, Bapcon and Accessories, opacity monitor and accessories, ash level indicators etc, is in the scope of work.
3.20.2	Installation of Cable trays/cable ducts
3.20.3	Various types of sheet metal, galvanized cable tray, i.e. Perforated, ladder type, seal metal duct, solid bottom tray, shall be provided in standard lengths along with accessories like hardware, bends, reducers, coupler plate, tray covers and tray clamps etc.
3.20.4	Installation of cable tray/cable duct shall include cutting, laying, jointing, supporting, drilling holes in the support, providing tees/reducers/bends/clamps as per tray route layout, fabrication of bends/tees/reducers from straight length, fixing of tray covers, welding of tray on support, cleaning and application of cold galvanizing paint on weld joints (supply of paint is in the scope of contractor). Installation of tray/duct covers, wherever provided, will be done as a part of tray erection and no extra rates will be payable.
3.20.5	In case cable trays are required to be fabricated from structural steel and installed no separate rate shall be paid for fabrication, however erection payment shall be made as per rate finalized for ESP erection.
3.20.6	Cable trays/ducts have to be routed underground in cable trench, over head on structure, valves, floors etc. for various applications such as cable laying, copper tubes, conduits, thermocouple, temperature gauge capillary etc.
3.20.7	Installation of Copper tubes/SS tubes/copper pipes shall include cutting into required length, laying, bending, cleaning, brazing wherever required, fixing of brass fittings like compression fittings/tees/end connectors/straight connectors/bulk heads/valves

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	etc., supporting clamping including supply of clamps and hardware, flushing and conducting leak test.
3.20.8	Cable laying (power / control / instrumentation shielded / unshielded cables / plug-in cables / coaxial / UTP / STP / data highway, armoured / un-armoured, single / multi-core, PVC/HR PVC/FRLS/TEFLON/XLP insulation, optical fibre)
3.20.9	Cable laying includes cutting to the required length, laying in overhead/underground cable trench/through pipes/flexible conduits, dressing/clamping in tray, drilling of holes in gland plates in panels and junction box, glanding, splicing, dressing of spliced wire inside the panel and JBs, providing PVC numerical/alphabetical / printed ferrules, termination by using crimp type copper tinned/aluminium lugs, insulated/un-insulated, termination (crimp, soldering, etc.), plug-in connections with insert type crimping, providing identification PVC/aluminium cable tags (at both the ends and at 15 m intervals throughout the route length and also at each bend), continuity checking, insulation resistance checking, high voltage test on HT cables. Laying, etc of Optical fibre cables on cable trays /cable trench shall necessarily be done using flexible conduit.
3.20.10	Entry to the panels and JBs may be at top, sides or bottom. All cables are required to be properly supported and clamped near to the JB/panel.
3.20.11	Wherever cable glanding is not possible, either due to the gland plate size limitations or more number of cable entries, prefab plug-in cables, etc., for such cases cables may have to be lifted inside the panel by either making cut-out in gland plate and providing rubber profile for sharp edge protection or alternatively, providing 4" or 6" PVC pipe coupling gland and these pipe coupling gland shall be supplied by contractor within the quoted rate of cable laying.
3.20.12	Copper tinned lugs of various types (pin, ring, fork, snap-on) upto 4 sq.mm, PVC cable ties, PVC ferrules, PVC button and tapes, cable identification tag of PVC/metallic, clamping and dressing material with hardware, PVC sleeves etc. shall be supplied by the contractor within the quoted rates for cable laying. The quality of material shall be got approved from BHEL engineer prior to their use on job.
3.20.13	All care should be taken to avoid abrasion, tension, twisting, kinking, stretching of cables during installation.
3.20.14	Cable shielding – all signal cables are supplied with bare shielded copper wire/with braided wire shield. Generally shield wire is kept isolated at instrument/field device end and continuity is maintained through JBs and grounded at panel end only. While terminating the shield wire either in panel or JBs, PVC sleeves are to be used to avoid two-point earthing.
3.20.15	Wherever cables run through ducts, conduits, valves, etc., they shall be sealed using

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	fire/weather proof compound. In addition to this, cable entry in panels, MCCs, instruments, electrical actuators etc., are also required to be sealed. The required material for doing so shall be included by contractor in the cabling scope.															
3.20.16	Many of the cable trays and cables have to be laid in cable trenches. For this purpose, the cover of the trenches have to be opened for working in site and whenever the cables are to be laid in existing cable tray, all safety precautions have to be observed. After completing the work, the trenches have to be cleaned and covers put back into position. Contractor shall also carry out de-watering from the trenches if required and arrange pumps etc., at his cost.															
3.20.17	Looping wire at terminal block of panels and electrical actuator as shown in the interconnection diagrams or as required is to be done by contractor at no extra cost.															
3.20.18	Contractor shall carefully plan the cutting schedule of each cable drum in consultation with site engineer such that wastage are minimized.															
3.20.19	<p>The erection contractor shall make every effort to minimize wastage during erection work. In any case, the wastage shall not exceed the following limits;</p> <table border="1"><thead><tr><th>Sl No.</th><th>Item</th><th>% Wastage on issued Qty</th></tr></thead><tbody><tr><td>1.</td><td>Fabrication steel</td><td>2</td></tr><tr><td>2.</td><td>Each size of power cables</td><td>1</td></tr><tr><td>3.</td><td>Each size of control/Inst cables</td><td>2</td></tr><tr><td>4.</td><td>Impulse pipe/tubes/GI pipes/copper tube</td><td>1</td></tr></tbody></table> <p>If the actual wastage be more than the specified figure, then equivalent price of the excess portion will be deducted from the contractor's bill.</p>	Sl No.	Item	% Wastage on issued Qty	1.	Fabrication steel	2	2.	Each size of power cables	1	3.	Each size of control/Inst cables	2	4.	Impulse pipe/tubes/GI pipes/copper tube	1
Sl No.	Item	% Wastage on issued Qty														
1.	Fabrication steel	2														
2.	Each size of power cables	1														
3.	Each size of control/Inst cables	2														
4.	Impulse pipe/tubes/GI pipes/copper tube	1														
3.20.19	<p>Junction Boxes :</p> <p>Different types of junction boxes are to erected by the contractor like junction boxes below 48 ways and above 48 ways. The junction boxes are to be located at the locations jointly decided at site during erection. The junction boxes are to be erected on the frames fabricated at site.</p>															
3.20.20	Installation of panels															
3.20.21	Electrical control panels, electronic control panels, etc., are normally supplied in suit of either one/two/three or loose shipping sections with integral base frame or loose supplied. These panels may have to be installed as stand alone or in groups consisting of number of panels in each row, depending upon the plant layout and															

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	foundation arrangement.
3.20.22	Installation of panel shall include fixing of base frame, fabrication of base frame if required, levelling, alignment, fixing of anti-vibration pads, removal of side covers, fixing of cubicle interconnection hardware, bus bar jointing, wiring interconnection, welding and grouting of panels and base frames, mounting of panel canopy wherever supplied as part of panel, drilling of gland plates and sealing of cable entries. In certain case where canopies are not supplied but have to be fabricated out of MS sheets provided by BHEL, no separate rate shall be paid for fabrication however erection payment shall be made as per rate finalized for ESP erection.
3.20.23	Panels have to be shifted to their locations through floor openings, temporary openings like floor grills, door etc. which shall be part of work and no claim whatsoever will be entertained with regard to non-availability of opening as per shortest route etc. Panels have to be erected at different locations and elevation in ESP control room etc.
3.20.24	Panel and instruments once erected in position should be properly protected using necessary care to prevent ingress of dust/moisture. This will have to be periodically cleaned and surroundings have to be kept tidy.
3.20.25	Wherever the panels to be mounted on cable trenches, channel supports have to be provided across the cable trench over which the base frame of panel shall be mounted. For such work, structural steel fabrication, installation rates shall be applicable.
3.20.26	<p>Normally the panels shall be supplied with instruments, relays, meters, electronic modules etc. mounted and pre-wired. However, if these are supplied loose / separately for safety in transit, contractor shall mount/wire such devices as part of the panel installation work and no separate rates shall be applicable for this. Unless otherwise specially listed in the rate schedule. 11.10.7</p> <p>No separate payment shall be made for replacement of any devices like electronic modules, relays, conductors, terminal block, push buttons etc. which are found defective during pre-commissioning / post-commissioning of any equipment / item. 11.10.8 For the panels erected by other agencies, commissioning/calibration work and trouble shooting has to be carried out by the contractor as part of testing and commissioning work as per the quoted rates.</p> <p>Minor civil works like drilling, chipping, punching holes and opening in concrete floors, slabs and brick walls, grouting, related to Rack, support installation, minor civil works required for installation of control panels, Junction boxes etc., shall be included in the erection cost of such items. Also all miscellaneous civil works like chipping away and making good as necessary in floor slab/wall for cabling / earthing etc., as required are included in the scope for which no separate payment is applicable. The scope also</p>

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	includes supply of grouting material, if any.
3.20.27	Supplier's instruction manuals, packing slips, door keys etc. received along with the panels should be promptly handed over to BHEL's engineer on opening of the panels.
3.21	All normal erection and assembly techniques necessary for completion of works under this specification and magnitude have to be carried out. It is not possible to specifically list out all of them. Absence of any specific reference will not absolve the contractor of his responsibility for the particular operation. These would include:
3.22	Scaffolding and rigging operations,
3.23	Machine/ flame/ electric cutting, grinding, welding, radiography and stress relieving
3.24	Fitting, fettling, filing, straightening, chamfering chipping, scrapping, reaming, as cleaning, checking, leveling, blue matching, aligning and assembly.
3.25	Machining, surface grinding, drilling, doweling, shaping
3.26	Temporary erections for alignment, dismantling of certain equipment for checking, cleaning, servicing and site fabrication.
3.27	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.
3.28	No members of any ladder or structure or platform should be cut without specific approval of BHEL. In case it is necessary to cut, the contractor shall rectify or repair in a manner acceptable to BHEL and customer without any additional cost.
3.29	The contractor shall erect scaffolding/ temporary platforms for erection. These should be of adequate capacity and shall never be over loaded. These should be replaced when not found suitable during erection work and dismantled on work completion and removed from work site.
3.30	It shall be the responsibility of the contractor to provide ladders on columns for initial work till such time stairways are completed. For this, the ladder should not be welded on the column and should be pre-fabricated clamping type ladders. No temporary welding on any structural member is permitted except under special circumstances with the approval of BHEL. In case it is absolutely necessary then the contractor shall cut the temporary structure and rectify the column as directed by the engineer.
3.31	The contractor is strictly prohibited in using the Boiler/ ESP/ 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.
3.32	The material for platform section shall be supplied in running meters. These shall be

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	cut to size/ shape/ fabricated to required size/ shape and to be welded by contractor.
3.33	Certain adjustment in length may be necessary while erecting pipelines, casings etc. The contractor should remove the extra lengths / add extra lengths to suit the final layout after preparing edges afresh by adopting specified heat treatment procedures.
3.34	ESP collecting electrodes may require straightening and repair due to minor transport damages before erection and spot heating in position to get correct alignment and same will be carried out by the contractor at no extra cost.
3.35	The contractor shall carry out trial run of all motors including checking the direction of rotation in the uncoupled condition. Checking of alignment and re-coupling of the motor to the driven equipment as per instructions of BHEL engineer and to their satisfaction.
3.36	Some of the rotating equipment and electrical motors are provided with protective greases only. Contractor shall arrange for cleaning of the same with kerosene or some other reagent. If necessary, dismantling some of the parts of the equipment would be necessary. He shall arrange for re-greasing/ lubricating them with recommended lubricants and for assembling back the dismantled parts, at quoted rate. Lubricants will, however, be supplied free of cost by BHEL.
3.37	After initial trial of rotating equipment, control and power cabling for motors and other equipment/ instrumentation shall have to be disconnected for checking alignment and re-setting/ re-alignment/ hot alignment. Contractor shall have to arrange for disconnecting control and power cabling as per BHEL engineer's instructions and clearance and reconnect the control and power cabling after realignment. Quoted tonnage rate shall be inclusive of the above.
3.38	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.
3.39	Contractor shall arrange changing of preservative oil in the gearboxes, journal and other bearing assemblies of rotating equipment when in storage areas or after erection of equipment as the case may be as per the instructions of BHEL engineer. Necessary lubricants/ oil will be supplied by BHEL and the same will be drawn by contractor from BHEL/ customer's stores and transporting to site. No additional payment will be made for such works even though supply of lube oil might have been made under regular dispatch-able unit (DU) number against product group main assembly (PGMA) and appearing in the shipping list. Prior to the commissioning of the equipment, oil should be drained and collected in drums provided by BHEL and returned to BHEL/ customer's stores.
3.40	All electrical cabling including proper glanding, termination, dressing etc., control and instrumentation works required for completion of Electrostatic Precipitator including its commissioning shall be part of this work. This will include erection of all electrical equipment such as rectifier, transformers, busduct and power supply and control panel, laying of trays and cables and other associated equipment. For cabling job as included in above in the scope, while BHEL shall supply cable lugs (beyond 4 sqmm size free of cost, bidder shall supply necessary copper-tinned cable lugs (upto 4 sqmm), clamp, ferrule, wire markers, pvc binding strap, adhesive tape etc. Bidder's quoted rates shall be inclusive of this. Cable gland shall be of double compression type and of brass material.

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3.41	The contractor at no extra cost to BHEL shall carry out servicing and realignment of skid mounted equipment.
3.42	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.
3.43	In the case of structural members, pipes, plates, ducts etc, in certain cases, the raw material will be supplied in random lengths and the contractor will have to make up the length / prepare the edges to suit the matching profiles, weld / bolt connect the joints within the quoted rates / prices.
3.44	All the equipments / material to be taken inside the plant building shall be cleaned thoroughly before taking them inside and erect. The contractor shall clean, wherever necessary and paint inside surfaces of the equipments like coolers, oil tanks, Rubber expansion joint assemblies and other components as per instruction of BHEL Engineer during erection at the quoted rate. The necessary compressor for air cleaning is to be arranged by contractor at his cost.
3.45	All attachment welding including those for insulation and refractory work coming on the pressure parts shall be done by the contractor. The hooks are suitable for stud welding machines. Contractor's quoted rate shall include all these contingencies. Attachment welding on pressure parts shall be done by qualified and certified welders only.
3.46	HSFG Bolts are to be tightened by turn of nut method / Torque Wrench, as per the instruction of BHEL Engineer. The bolted joints shall be jointly checked by BHEL / Customer and contractors personnel for the required tightness and retightened wherever necessary. The tightened bolts shall be identified by color paints. Facility for random checking with calibrated Torque Wrench shall also be provided by contractor.
3.47	Certain instruments like pressure switches, gauges, air sets, regulators, filters, junction boxes, power cylinders, dial gauges, thermometers, flow meters, valve actuators, flow indicators etc., are received in assembled conditions as integral part of equipments. Contractor shall dismantle such instruments and re-erect whenever required prior to commissioning. Sometime this may have to be handed over to store or instrumentation contractor.

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Chapter-IV: Welding, Heat-Treatment, Radiography and NDT

4.0	WELDING HEAT TREATMENT, RADIOGRAPHY AND NON-DESTRUCTIVE TESTING
4.1	All welders including tack welders, structural and high pressure welder shall be tested as per ASME section IX/ IBR and approved by BHEL Engineer before they are actually engaged on work even though they may possess a valid IBR 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 AND performance 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.
4.2	Engineer may stop any welder from the work if his performance is unsatisfactory for any technical reason or if there is a high percentage of rejection in the joints welded by him. The welder's is having passed qualification tests does not absolve the contractor of contractual obligation to continuously check the welder's performance.
4.3	Faulty welds caused by the poor workmanship shall be cut and re-welded at the contractor's expense. The Engineer prior to any repair being made shall approve the procedure for the repair of defective welds. After the repair has been carried out, the compliance shall be submitted to the quality engineer.
4.4	All expenses for testing of contractor's welders including destructive and nondestructive tests conducted by BHEL at site or at laboratory shall have to be borne by the contractor only. Limited quantity of tube and pipe material required for making test pieces will be supplied by BHEL free of cost.
4.5	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.
4.6	Only BHEL/ BHEL's client approved electrodes and filler wires specifically approved / applicable to this project will be arranged and used by the contractor , within the finally quoted price. BHEL reserves the right to test any approved electrode being used by the contractor. Testing charges for the same shall be borne by the contractor. All electrodes shall be baked and dried in the electric electrode-drying oven to the required temperature for the period specified by the Engineer before these are used in erection work. All welders shall have electrodes drying portable oven at the work spot. The electrodes brought to the site will have valid manufacturing test certificate. The test certificate should have a co-relation with the lot number/ batch number given on electrode packets. No electrodes will be used in the absence of above requirement. The thermostat and thermometer of electrode drying oven will be also calibrated and test certificate from Govt. approved/ accredited test house traceable to National/ International standards will be submitted to BHEL before putting the oven in use. The contractor shall also arrange periodical calibration for the same.
4.7	All butt/ fillet welds shall be subject to dye penetration test/ other tests as per the instructions of the engineer at no additional cost.

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4.8	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.
4.9	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.
4.10	All welds shall be painted with anticorrosive red oxide paint once radiography and stress relieving works are over. Necessary consumables and scaffolding etc including paints shall be provided by contractor at his own cost.
4.11	Pre-heating, radiography 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.
4.12	Contractor shall arrange all necessary stress relieving equipment with automatic recording devices, if applicable. The contractor shall arrange for labour, heating elements, thermocouples, thermo-chalks, temperature recorders, thermocouple attachment units, graphs, sheets insulating materials like asbestos cloth, ceramic beads, asbestos ropes etc. required for heat treatment/ stress-relieving operations. The contractor should take a note of the following:
4.12.1	Temperature shall be measured by thermocouple and recorded on a continuous printing type recorder. All the recorded graphs for heat treatment works shall be the property of BHEL.
4.12.2	All stress relieving equipment will be used after due calibration and submission of test certificate to BHEL. Periodic calibration from Govt. Approved/ accredited Test Houses traceable to National/ International standards will also be arranged by the contractor for such equipment at his cost.
4.12.3	The contractor shall obtain the signature of Engineer or his representative on the strip chart of the recorder prior to the starting of SR operations.
4.13	The contractor shall also be equipped for carrying out other NDT like LPI/ MPI/ Ultrasonic testing/ Hardness test etc. as required as per welding schedules/ drawings within the finally accepted price/ rates.
4.14	The technical particulars, specification and other general details for radiography work shall be in accordance with ASME, IBR or ISO as specified

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Chapter-IV: Welding, Heat-Treatment, Radiography and NDT

	by BHEL.
4.15	The contractor for radiography work shall use iridium-192 or any other radiographic source required. 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).
4.16	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 in between the range of 1.5 to 2.0.
4.17	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.
4.18	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.
4.19	Lead intensifying screens for front and back of the film should be used as per the above-referred ASME specification.
4.20	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.
4.21	For multiple exposures on pipes, an overlap of about 25-mm of film should be provided.
4.22	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.
4.23	All arrangements for carrying out radiography work including dark room and air conditioner and other accessories if required 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.
4.24	Contractor shall note that 100% radiography will be done at the initial stages on all the piping welding joints. Subsequently radiographic inspection will be done on the basis of quality of welding. 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. Radiography on LP piping joints is not envisaged. However other NDT test as called for in the FQP including LPI, MPI, UST and HT will have to be carried out.
4.25	All the Radiographs shall be properly preserved and shall become the

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	property of BHEL. They are to be reconciled with the work done, joints radiographed and submitted to BHEL/ customer.
4.26	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.
4.27	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.
4.28	Wherever radiographs are not accepted, on account of bad shot, joints shall be re-radiographed and re- submitted for evaluation.
4.29	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.
4.30	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.
4.31	Heat treatment and radiography may be required to be carried out at any time (day and night) to ensure the continuity of the progress. The contractor shall make all necessary arrangements including labour, supervisors/ Engineer required for the work as per directions of BHEL.
4.32	The contractor shall assist BHEL Engineer in preparing complete field welding schedule for all the field welding activities to be carried out in respect of piping and equipment erected by him involving high pressure welding at least 30 days prior to the scheduled start of erection work at site. The contractor shall strictly adhere to such schedules

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Chapter-V: Application of Refractory & Insulation

5.0	APPLICATION OF REFRACTORY & INSULATION
5.1	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 without any extra cost to BHEL.
5.2	Contractor has to supply and apply heat resistant primer on welded portions before application of insulation.
5.3	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.
5.4	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.
5.5	The contractor should ensure, proper finishing of surface of the insulation, sheeting and cementing
5.6	The contractor should ensure that the finished surface of the insulation works conforms to the dimensions and tolerances given in the drawings. Aesthetic finish and accuracy of work are most important.
5.7	It is the responsibility of the contractor to ensure that the insulation materials and sheet metal covering issued to him for application are well protected against loss or damage from weather conditions. Closed/ semi closed sheds or any other arrangements required for this will be made by him at his cost. If any damage occurs to the material due to improper storage or due to any causes attributable to the contractor except for normal breakage or damages allowed in such cases, the cost of such damaged material shall be to the account of the contractor.
5.8	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 they will also supply anti-corrosive black bituminous paint and bituminous sealing compound required for above works at his cost. However, if any material is received from the unit, the same shall be issued free of cost to the contractor
5.9	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 be covered within the scope of this contract.
5.10	A logbook shall be maintained by the contractor to obtain clearance for application of insulation. If the contractor does the work on his own accord

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	without prior permission the area may have to be redone at his cost.
5.11	Contractor is liable for the exact accounting of the material issued to him and he shall make any unaccountable losses good. Wastage allowance for the material issued are as below:
5.11.1	Wool / LRB mattresses and cladding sheets..... 2%
5.11.2	Insulation bricks and mortar..... 2%
5.11.3	Castable refractory..... 1%
5.12	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.
5.13	The contractor shall leave certain gaps and opening while doing the work as per instructions of BHEL engineer to facilitate inspection during commissioning and to fix gauges, fittings and instruments. The gaps will have to be finished as per drawings at a later date by the contractor at his cost.
5.14	If during erection and commissioning any of the parts are to be temporarily fixed and then replaced by permanent ones at a later date or if any of the parts are to be removed for modification, rectification, adjustment and then refitted or if some parts are to be opened for inspection and checking and for measurement of metal surface temperature the same may necessitate removal and re-application of insulation and sheet metal cladding, which shall be done by the contractor and the erection rate quoted shall be inclusive of such contingencies.
5.15	Removable type of insulation shall be provided for valves, fittings, expansion joints etc as per the drawings or as directed by BHEL Engineer.
5.16	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.
5.17	Insulation of expansion joints, dampers, etc shall be carried out after NDT/ gas tightness test is completed.
5.18	Special type of Insulation wool used in pent house shall not be cut indiscriminately.
5.19	Contractor shall mix and apply the refractory/ insulation as per the instructions of BHEL Engineer. Castable refractory/ insulation after application shall be cured as per the instructions of BHEL Engineer. The contractor shall provide the required quantity of wire nails, planks for formwork and other materials for centering and grouting work.
5.20	Application of castable and pourable refractory between tubes, around burners, on ceiling and as directed by Engineer and as per detailed drawings and

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	specifications.
5.21	Dressing of insulation brick to suit site conditions, curing refractory concrete applied/ sheet cladding over insulation forms a part of this work.
5.22	Contractor shall observe all precautions for laying/ curing of castable refractory. Any defective works found shall be re-laid by contractor at his cost.
5.23	Making structural supporting work for pourable insulation, laying pourable insulation, adhering to all specifications and instructions during application forms a part of this work.
5.24	Day to day cleaning of insulation debris and scraps to be ensured by the contractor. Excessive wastage will attract cost recovery.

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Chapter-VI: Painting including Finish painting

6.0	PAINTING INCLUDING FINISH PAINTING
6.1	All exposed metal parts of the equipment, structure, auxiliaries, piping, and other items (covered within the scope of this contract) after installations are to be painted. The surfaces are to be thoroughly cleaned of all dirt, rust, scales, grease, oils and other foreign materials by wire brushing, scrapping, any other method as per requirement of BHEL and NTPC. The same will be inspected and approved by the engineer before painting.
6.2	Mostly the equipment/ items/ components will be supplied with one coat of primer paint and one coat of finish paint. However during storage and handling, the same may get peeled off/ deteriorate. All such surfaces are to be thoroughly cleaned and to be touch up painted with suitable approved primer and finish paint matching with shop paint/ approved final colour. Besides above two coats of approved primer paint is to be applied on all the bare/ unpainted surfaces. The gas cut stubs would require being ground and rounded.
6.3	After applying the primer paints, wherever required, all structure/ equipment/ items, shall be finish painted with paints as specified by BHEL engineer. The number of coats/ paint thickness shall be as indicted in the drawing/ documents. However at least two coats of finish painting is to be applied. In case proper finish is not obtained in two coats, the contractor shall apply additional coat (s) till proper finish/ paint thickness is achieved. Certain equipment/ Items are required to be painted with approved quality heat resistant paint/ primer. After completion of painting all bright spots shall be cleaned to the satisfaction of Engineer.
6.4	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.
6.5	Contractor at no extra cost to BHEL shall supply all specified paints (enamel, epoxy, heat resistant or of any other approved specifications applicable to this project), thinners and primers as per drawing, documents and specifications what soever; tools and other consumables including scaffolding materials required for finish painting. Paint is to be BHEL/ NTPC approved make only and painting should be as per colour scheme and quality approved/ specified by BHEL Engineer. Valid Test Certificate for the paint so supplied shall be made available before use of the same on work. The paints for ESP parts/ structures shall be applied as per the drawing, documents, specifications and approved by BHEL or its customer as mentioned above for finish painting. The contractor has to supply and apply the paints for exposed structural parts and other components mainly for supporting structure of ESP, Hopper approach platforms and stringers for stairs case and guard plates covered under various PGMAs. Synthetic enamel paint shall be applicable for most of the other parts. However all the parts of ESP are to be painted with the similar quality of paints and primers as applied by the supplier on the parts/ specifications within the awarded price of this contract. Painting shall not be required for the parts covered with thermal

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	insulation.
6.6	The contractor may be required to fill up dents/ marks by applying putty before final painting of equipment. All materials and arrangements have to be made within quoted lumpsum price/ rates.
6.7	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.
6.8	The painters have to under go test and only qualified painters will be allowed to work.

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Chapter-VII: Testing, pre-commissioning, commissioning and post-commissioning

7.0	TESTING PRE-COMMISSIONING, COMMISSIONING AND POST-COMMISSIONING.
7.1	<p>The contractor shall carry out all the required tests and pre-commissioning and commissioning activities required for their successful and reliable operation. These would include clean air flow test, air tightness test or other tests as instructed by BHEL using contractors own consumables, labour and scaffoldings etc. All the chemicals required for carrying out these activities will be supplied by BHEL free of cost.</p> <p>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.</p> <p>Specialized test equipment, if any, shall be provided by BHEL/ its client free of hire charges. However contractor has to take proper care of the equipment issued to him.</p>
7.2	Commissioning of ESP shall involve required tests such as air leak test, gas distribution test, motor no load test, rapping mechanism trial runs, interlock tests, charging of transformer fields, commissioning of all electrical equipment / panels, heaters and their proper tuning etc. The contractor shall provide all consumables, labour, scaffoldings and items required for satisfactory testing.
7.3	After completion of erection of furnace, ducts and air heaters, a test shall be performed on the steam generator by other contractor to establish the tightness of the erected equipment from the outlet of FD fan through the steam generator up to stack. The contractor shall be responsible for his portion of equipment for all the tests.
7.4	All the tests may have to be repeated till all the equipment satisfy the requirement/ obligation of BHEL at various stages. The contractor shall do all the repairs for site-welded joints arising out of the failure during testing.
7.5	The scope of pre-commissioning activities cover installation of all necessary equipment including temporary piping, supports, valves, blanking, pumps, tanks, with access platforms valves, along with accessories required for hydro test, chemical cleaning, steam blowing or for any other tests as applicable. The scope also covers the off site disposal of effluents.
7.6	<p>The contractor may note that no separate payment shall be released for any temporary works that are to be carried out for conducting pre-commissioning and commissioning tests. Bidders are advised to include expenses on temporary works along with the rates being quoted by them. Broadly the work on temporary systems will be divided as under:</p> <p>Erection etc. of blowers and blanks and putty required for conducting air tightness test and GD Test are to be installed. (Putty to be procured by the contractor).</p> <p>Dismantling of the temporary equipment will be done by the agency that has erected the equipment. He will also return the equipment to the stores.</p>
7.7	Commissioning of the ESP will involve trial run of all the equipment erected.

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	The boiler has to be lighted up for refractory drying, alkali boil out, acid cleaning, passivation, preservation, steam blowing and floating of safety valves. Flushing of all the lines by air, oil or steam as the case may be, trial run of the boiler, servicing of valves and any other works incidental to commissioning are to be carried out. During this period though the BHEL's customer's staff will also be associated in the work, the contractor's responsibility will be to arrange for the complete requirement of supervision, men, consumables, T&P and IMTEs till such time the commissioned units are taken over by the BHEL's customer for the entire scope awarded to contractor.
7.8	It shall be the responsibility of the contractor to provide various categories of workers in sufficient numbers along with Supervisors during Pre-commissioning, commissioning and post commissioning of equipment and attending any problem in the equipment erected by the contractor till handing over. The contractor will provide necessary consumables, T&Ps, IMTEs etc., and any other assistance required during this period. Association of BHEL's/ Client's staff during above period will not absolve contractor from above responsibilities.
7.9	It shall be specifically noted that the above employees of the contractor may have to work round the clock along with BHEL Engineers and hence overtime payment by the contractor to his employees may be involved. The contractors finally accepted rates should be inclusive of all these factors also.
7.10	In case, any rework is required because of contractor's faulty erection, which is noticed during pre-commissioning and commissioning, the same has to be rectified by the contractor at his cost. If any equipment/ part is required to be inspected during pre-commissioning and commissioning, the contractor will dismantle/ open up the equipment/ part and reassemble/ redo the work without any extra claim.
7.11	During commissioning, opening/ closing of valves, changing of gaskets, realignment of rotating and other equipment, attending to leakage and adjustments of erected equipment may arise. The finally accepted price/ rates shall also include all such work.
7.12	The contractor shall make all necessary arrangements including making of temporary closures on piping / equipment for carrying out the hydro-static testing on all piping, equipment covered in the specification at no extra cost.
7.13	The valves will have to be checked, cleaned or overhauled in full or in part before erection, after acid cleaning, steam blowing and during commissioning as may be necessary.
7.14	In case any defect is noticed during tests, trial runs and commissioning such as loose components, undue noise or vibration, strain on connected equipment etc., the contractor shall immediately attend to these defects and take necessary corrective measures. If any readjustment and realignment are necessary, the contractor at his cost shall do the same as per Engineer's instructions including repair, rectification and replacement work. The parts to be replaced shall be provided by BHEL.
7.15	All temporary supports shall be removed in such ways that pipe supports are

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	not subjected to any sudden load. During hydraulic testing of 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.
7.16	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 un-serviced. Wherever necessary as required by BHEL Engineer, the contractor shall arrange to lap/ grind valve seats.
7.17	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.
7.18	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.