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**TENDER SPECIFICATION**

**TENDER NO. BHEL/NR/SCT/GADARWARA/ESP/UNIT 1&2/972**

**FOR**

**“Erection, Testing, Commissioning & handing over of ELECTROSTATIC PRECIPITATOR (ESP), its insulation and final painting including supply of paints etc. of unit no. 1&2 at 2 X 800 MW Gadawara STPS of NTPC, Gadawara, M.P.”**

**PART I – TECHNICAL BID**



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



ISO 9001, ISO 14001,  
OHSAS 18001 & SA 8000  
certified company  
SubContract and Purchase Deptt.

**Bharat Heavy Electricals Limited**  
(A Govt. Of India Undertaking)  
**Power Sector – Northern Region,**  
**Plot No. 25 , Sector - 16A ,**  
**Distt. Gautam Budh Nagar, NOIDA – 201 301(INDIA)**  
**Phone: 0091-0120- 2416513/ 2416407**  
**Fax 091-0120-2416528**  
**Email: prashant@bhelsnr.co.in/ rb@bhelsnr.co.in**

**TENDER NO. BHEL/NR/SCT/GADARWARA/ESP/UNIT 1&2/972**

**IMPORTANT NOTE**

PURCHASER OF THIS TENDER DOCUMENT IS ADVISED TO CHECK AND ENSURE COMPLETION OF ALL PAGES OF TENDER DOCUMENT AND REPORT ANY DISCREPANCY TIMELY FOR CORRECTIVE ACTION, IF ANY, TO THE ISSUING AUTHORITY BEFORE THE BIDS ARE SUBMITTED. ORIGINAL COPY OF TENDER DOCUMENT COMPLETE IN ALL RESPECTS MUST BE SUBMITTED BACK AS PART OF THE BID WITHOUT WHICH THE SAME IS LIABLE TO BE REJECTED BY BHEL.

THIS TENDER SPECIFICATION ISSUED TO:

M/S-----  
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Rev 01  
1<sup>st</sup> Jun  
2012

# NOTICE INVITING TENDER

(Document No PS:MSX:NIT)

Bharat Heavy Electricals Limited



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**NOTICE INVITING TENDER (NIT)**

**NOTE: BIDDER MAY DOWNLOAD FROM WEB SITES**

**OR**

**PURCHASE TENDERS FROM THIS OFFICE ALSO**

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To

Dear Sir/Madam

**Sub : NOTICE INVITING TENDER**

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

**1.0 Salient Features of NIT**

SL NO	ISSUE	DESCRIPTION
i	TENDER NUMBER	<b>BHEL/NR/SCT/GADARWARA/ESP/UNIT 1&amp;2/972</b>
ii	Broad Scope of job	“Erection, Testing, Commissioning & handing over of ELECTROSTATIC PRECIPITATOR (ESP), its insulation and final painting including supply of paints etc. of unit no. 1&2 at 2 X 800 MW Gadawara STPS of NTPC, Gadawara, M.P.”
iii	<b>DETAILS OF TENDER DOCUMENT</b>	
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> <span style="float: right;"><i>Applicable</i></span>
b	Volume-IB	<i>Special Conditions of Contract (SCC)</i> <span style="float: right;"><i>Applicable</i></span>
c	Volume-IC	<i>General Conditions of Contract (GCC)</i> <span style="float: right;"><i>Applicable</i></span>
d	Volume-ID	<i>Forms and Procedures</i> <span style="float: right;"><i>Applicable</i></span>
e	Volume-II	<i>Price Schedule (Absolute value).</i> <span style="float: right;"><i>Applicable</i></span>
iv	Issue of Tender Documents	<ol style="list-style-type: none"> <li><b>Sale from BHEL PS Regional office at :</b> Start : 11/09/14 , Time : 0900 HRS Closes: 06/10/14 , Time :1200 HRS</li> <li>From BHEL website (<a href="http://www.bhel.com">www.bhel.com</a>) Tender documents will be available for downloading from website till due date of submission</li> </ol> <span style="float: right;"><i>Applicable</i></span>
v	DUE DATE & TIME OF OFFER SUBMISSION	Date : 06/10/14 , Time : 1500 HRS Place : Noida <span style="float: right;"><i>Applicable</i></span>
vi	OPENING OF TENDER	Date : 06/10/14 (Within 2 hours of the latest due date and time of <span style="float: right;"><i>Applicable</i></span>

		offer submission). Notes: (1) In case the due date of opening of tender becomes a non-working day, then the due date & time of offer submission and opening of tenders get extended to the next working day. (2) Bidder may depute representative to witness the opening of tender	
vii	EMD AMOUNT	Rs 2,00,000/-	Applicable
viii	COST OF TENDER	Rs 2000/-.	Applicable
ix	LAST DATE FOR SEEKING CLARIFICATION	Date: 22/09 /2014 Along with soft version also, addressing to undersigned & to others as per contact address given below	Applicable
x	SCHEDULE OF Pre Bid Discussion (PBD)		<b>Not applicable.</b>
xi	INTEGRITY PACT & DETAILS OF INDEPENDENT EXTERNAL MONITOR (IEM)	Shri D.R.S Chaudhary, IAS (Retd.) Flat No. L-202 & L-203 (1 <sup>st</sup> Floor) Ansal Lake View Enclave Shamla Hills Bhopal- 462 013  Email: <a href="mailto:dilip.chaudhary@icloud.com">dilip.chaudhary@icloud.com</a>	<b>Applicable</b>
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) <b>and not in the newspapers</b> . Bidders to keep themselves updated with all such information	

- 2.0 The offer shall be submitted as per the instructions of tender document and as detailed in this NIT. Bidders to note specifically that all pages of tender document, including these NIT pages of this particular tender together with subsequent correspondences shall be submitted by them, duly signed & stamped on each page, as part of offer. **Rates/Price including discounts/rebates, if any, mentioned anywhere/in any form in the techno-commercial offer other than the Price Bid, shall not be entertained.**
- 3.0 Unless specifically stated otherwise, bidder shall remit cost of tender and courier charges if applicable, in the form of Demand Draft drawn in favour of Bharat Heavy Electricals Ltd, payable at Power Sector Regional HQ at 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
- 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. For other details and for 'One Time EMD' please refer General Conditions of Contract.
- 5.0 **Procedure for Submission of Tenders:** The Tenderers must submit their Tenders to Officer inviting Tender, as detailed below:
- PART-I consisting of 'PART-I A (Techno Commercial Bid)' & 'PART-I B (EMD/COST of TENDER)' in two separate sealed and superscribed envelopes (ENVELOPE-I & ENVELOPE-II)
  - PART-II (Price Bid) – in sealed and superscribed envelope (ENVELOPE-III)

- One set of tender documents shall be retained by the bidder for their reference

6.0 The contents for ENVELOPES and the superscription for each sealed cover/Envelope are as given below.  
(All pages to be signed and stamped)

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

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

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

<b>OUTER COVER</b>	
	<p><b><u>ENVELOPE-IV</u></b> (MAIN ENVELOPE / OUTER ENVELOPE)            superscribed as:            TECHNO-COMMERCIAL BID, PRICE BID &amp; EMD            TENDER NO:            NAME OF WORK:            PROJECT:            DUE DATE OF SUBMISSION:</p> <p><b>CONTAINING THE FOLLOWING:</b></p>
i	<ul style="list-style-type: none"> <li>○ Envelopes I</li> <li>○ Envelopes II</li> <li>○ Envelopes III</li> </ul>

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

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

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

9.0 **Assessment of Capacity of Bidders:**

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

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

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

i). **Total number of Packages**

Total number of Packages in hand = P

Where

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

- II. **PERFORMANCE:** Here 'Monthly Performance' of the bidder for all the packages (**under execution/** executed during the 'Period of Assessment' in all the Power Sector Regions of BHEL) **SIMILAR** to the packages covered under the tendered scope, excepting packages not commenced shall be taken into consideration. The 'Period of Assessment' shall be 6 months preceding the cut off month. The cut off month for reckoning 'Period of Assessment' shall be the month two (2) months preceding the month corresponding to the 'latest date of bid submission', in the following manner:

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

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

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

- a)  $P_1, P_2, P_3, P_4, P_5, \dots, P_N$  etc be the packages (**under execution/** executed during the 'Period of Assessment' in all Regions) **SIMILAR** to the packages covered under the tendered scope, excepting packages not commenced. Total number of similar packages for all Regions =  $P_T$  (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<sub>BHEL</sub>' 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 <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>	P <sub>4</sub>	P <sub>5</sub>	...	P <sub>N</sub>	Total No of similar packages for all Regions = P <sub>T</sub> 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 the 'period of assessment for corresponding similar Package ( as in row 1)	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	...	T <sub>N</sub>	Sum (Σ) of columns (iii) to (ix) = T <sub>T</sub>
3	Monthly performance scores for the corresponding period (as in Row 2)	S <sub>1-1</sub> , S <sub>1-2</sub> , S <sub>1-3</sub> , S <sub>1-4</sub> , ... S <sub>1-T1</sub>	S <sub>2-1</sub> , S <sub>2-2</sub> , S <sub>2-3</sub> , S <sub>2-4</sub> , ... S <sub>2-T2</sub>	S <sub>3-1</sub> , S <sub>3-2</sub> , S <sub>3-3</sub> , S <sub>3-4</sub> , ... S <sub>3-T3</sub>	S <sub>4-1</sub> , S <sub>4-2</sub> , S <sub>4-3</sub> , S <sub>4-4</sub> , ... S <sub>4-T4</sub>	S <sub>5-1</sub> , S <sub>5-2</sub> , S <sub>5-3</sub> , S <sub>5-4</sub> , ... S <sub>5-T5</sub>	.. ... ... ...	S <sub>N-1</sub> , S <sub>N-2</sub> , S <sub>N-3</sub> , S <sub>N-4</sub> , ... S <sub>N-TN</sub>	-----
4	Sum of Monthly Performance scores of the corresponding Package for the corresponding period (as in row-3)	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	S <sub>5</sub>	...	S <sub>N</sub>	Sum (Σ) of columns (iii) to (ix) = S <sub>T</sub>

ii) Calculation of Overall 'Performance Rating' (R<sub>BHEL</sub>) 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<sub>BHEL</sub>' shall be calculated subject to availability of 'performance scores' for at least 6 'package months' in the order of precedence below:

- Period of Assessment.
- 12 months preceding the cut-off month
- 24 months preceding the cut-off month
- 36 months preceding the cut-off month

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

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

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

III. **'Assessment of Capacity of Bidder':**

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

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

**Note:**

- 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
- For  $R_{BHEL} = 60$ ,  $P_{Max} = '1'$
- For  $R_{BHEL} \geq 80$ , there will be no upper limit on  $P_{Max}$

The Bidder shall be considered 'Qualified' as per 'Assessment of Capacity of Bidder' for the subject Tender if  $P \leq P_{Max}$   
(where P is calculated as per clause 9.1)

IV. **Explanatory note:**

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

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

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

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

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

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

- d) In the unlikely event of all bidders shortlisted against Technical and Financial Qualification criteria not meeting the criteria on 'Assessment of Capacity of Bidders' detailed above, OR leads to a single tender response on applying the criteria of 'Assessment of Capacity of Bidders' or due to non-approval by Customer, then BHEL at its discretion reserves the right to consider the further processing of the Tender based on the **Overall Performance Rating 'R<sub>BHEL</sub>'** only, starting from the upper band.
- e) 'Under execution' shall mean works in progress as per the following:
- i. up to Boiler Steam Blowing in case of Steam Generator and Auxiliaries
  - ii. upto Synchronisation in case of all other works excepting sl no (i) and (iii)
  - iii. Upto execution of at least 90% of anticipated contract value in case of Civil & Structures (unit wise), Enabling works and upto 90% of material unloading (in tonnage) as per the original contract in case of MM Package.
- Note : BHEL at its discretion can extend (or reduce in exceptional cases in line with Contract conditions) the period defined against (i), (ii) and (iii) above, depending upon the balance scope of work to be completed.
- f) Performance evaluation in CL 9 above is applicable to Prime bidder and consortium partner (or Technical tie up partner) for their respective scope of work.

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

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

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

- 12.0 BHEL may decide holding of pre-bid discussion [PBD] with all intending bidders as per date indicated in the NIT. The bidder shall ensure participation for the same at the appointed time, date and place as may be decided by BHEL. Bidders shall plan their visit accordingly. The outcome of pre-bid discussion (PBD) shall also form part of tender.
- 13.0 In the event of any conflict between requirement of any clause of this specification/ documents/drawings/data sheets etc or requirements of different codes/standards specified, the same to be brought to the knowledge of BHEL in writing for clarification before due date of seeking clarification (whichever is applicable), otherwise, interpretation by BHEL shall prevail. Any typing error/missing pages/ other clerical errors in the tender documents, noticed must be pointed out before pre-bid meeting/submission of offer, else BHEL's interpretation shall prevail.
- 14.0 Unless specifically mentioned otherwise, bidder's quoted price shall deemed to be in compliance with tender including PBD.
- 15.0 Bidders shall submit Integrity Pact Agreement (Duly signed by authorized signatory who signs in the offer), **if applicable**, along with techno-commercial bid. This pact shall be considered as a preliminary qualification for further participation. **The names and other details of Independent External Monitor (IEM) for the subject tender is as given at point (1) above.**
- 16.0 The Bidder has to satisfy the Pre Qualifying Requirements stipulated for this Tender in order to be qualified. The Price Bids of only those bidders will be opened who will be qualified for the subject job on the basis of satisfying the Pre Qualification Criteria specified in this NIT as per Annexure-I (as applicable), past performance etc. and date of opening of price bids shall be intimated to only such bidders. BHEL reserves the right not to consider offers of parties under HOLD.
- 17.0 In case BHEL decides on a 'Public Opening', the date & time of opening of the sealed PRICE BID shall be intimated to the qualified bidders and in such a case, bidder may depute one authorised representative to witness the price bid opening. BHEL reserves the right to open 'in-camera' the 'PRICE BID' of any or all Unsuccessful/Disqualified bidders under intimation to the respective bidders.
- 18.0 Validity of the offer shall be for **six months** from the latest due date of offer submission (including extension, if any) unless specified otherwise.
- 19.0 BHEL reserves the right to decide the successful bidder on the basis of Reverse Auction process. In such case all qualified bidders will be intimated regarding procedure/ modality for Reverse Auction process prior to Reverse Auction and price will be decided as per the rules for Reverse Auction. .
- However, if reverse auction process is unsuccessful as defined in the RA rules/procedures, or for whatsoever reason, then the sealed 'PRICE BIDs' will be opened for deciding the successful bidder. BHEL's decision in this regard will be final and binding on bidder.
- 20.0 On submission of offer, further consideration will be subject to compliance to tender & qualifying requirement and customer's acceptance, as applicable.
- 21.0 In case the bidder is an "Indian Agent of Foreign Principals", 'Agency agreement has to be submitted along with Bid, detailing the role of the agent along with the terms of payment for agency commission in INR, along with supporting documents.
- 22.0 The bidders shall not enter into any undisclosed M.O.U. or any understanding amongst themselves with respect to tender.
- 23.0 **Not used**
- 24.0 The bidder shall submit documents in support of possession of 'Qualifying Requirements' duly self certified and stamped by the authorized signatory, indexed and properly linked in the format for PQR. In case BHEL requires any other documents/proofs, these shall be submitted immediately.

- 25.0 The bidder may have to produce original document for verification if so decided by BHEL.
- 26.0 The offers of the bidders who are on the banned list as also the offer of the bidders, who engage the services of the banned firms, shall be rejected. The list of banned firms is available on BHEL web site [www.bhel.com](http://www.bhel.com).
- 27.0 BHEL reserves the right to go for Reverse Auction (RA) instead of opening the sealed envelope 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.
- 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, or before price bid opening, attested copies of either EM-II certificate having deemed validity (two years from the date of issue of acknowledgement in EM-II) or valid NSIC certificate or EM-II certificate along with CA certificate (format enclosed as Annexure - 3) applicable for the year, certifying quantum of investment in plant and machinery within the permissible limit as per the act for relevant status (Micro or Small) where the deemed validity of EM-II is over. Date to be reckoned for determining the deemed validity will be last date of technical bid submission. Non submission of such documents will lead to consideration of their bids at par with other bidders and MSE status of such suppliers shall be shifted to Non MSE supplier till the supplier submits these documents.

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

No benefits shall be applicable for that particular enquiry if the required documents are not submitted before price bid opening.

### 30.0 Order of Precedence

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

- Amendments/Clarifications/Corrigenda/Errata etc issued in respect of the tender documents by BHEL
- Notice Inviting Tender (NIT)
- Price Bid
- 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**

- 01. Annexure-1: Pre Qualifying criteria.
- 02. Annexure-2: Check List.
- 03. Annexure-3: Chartered Accountant certificate for MSMED
- 04. Annexure-4: GENERAL TERMS AND CONDITIONS OF REVERSE AUCTION (RA)
- 05. Annexure-5: Integrity Pact
- 06. Other Tender documents as per this NIT.

**ANNEXURE - 1****PRE QUALIFYING REQUIREMENTS**

JOB	<b>"Erection, Testing, Commissioning &amp; handing over of ELECTROSTATIC PRECIPITATOR (ESP), its insulation and final painting including supply of paints etc. of unit no. 1&amp;2 at 2 X 800 MW Gadarwara STPS of NTPC, Gadarwara, M.P."</b>
TENDER NO	<b>BHEL/NR/SCT/GADARWARA/ESP/UNIT 1&amp;2/972</b>

<b>SL NO</b>	<b>PRE QUALIFICATION CRITERIA</b>	<b>Bidders claim in respect of fulfilling the PQR Criteria</b>
A	<b>Submission of Integrity Pact duly signed (if applicable)</b>	<b>Applicable</b>
B	<b>Technical Criteria</b>	<b>Applicable</b>
B-1	Bidder who wish to participate should have executed works of similar nature of at least  One Boiler/ESP of one unit of 190 MW or higher or One STG of 400 MW or higher, under direct order of BHEL during last 7 years, as on the date of opening of Technical Bid.	
C	<u>Financial Criteria</u>	<b>Applicable</b>
C-1	<u>TURNOVER</u> Bidders should have achieved an average annual financial turnover (Audited) of Rs. 870 Lacs or more over last three Financial Years (FY) i.e 2010-2011, 2011-2012, 2012-2013.	
C-2	<u>NETWORTH</u> Net worth of the bidder based upon the latest Audited Accounts as furnished for 'C 1' above should be positive.	<b>Applicable</b>
C-3	<u>PROFIT</u> 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.	<b>Applicable</b>
D	Relevant documents meeting above requirement at 'B' and 'C' shall be submitted by bidder	<b>Applicable</b>
E	Assessment of Capacity of Bidder to execute the work as per Sl no. 9 of NIT	<b>Applicable</b>
F	Approval of Customer by BHEL	<b>Applicable</b>
G	Consortium criteria	<b>Not Applicable</b>

**Explanatory Notes for QR 'B'**

1. For B , 'Executed' means
  - 1.1. "BOILER LIGHT UP" in respect of Boiler & Aux and ESP.
2. 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.
3. 'Similar' work means – Boiler or ESP or STG for 'MECHANICAL Works'
4. Bidder to submit Audited Balance Sheet and Profit and Loss Account for the respective years as given above along with all annexure

**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 <b>PRE QUALIFICATION CRITERIA</b> (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/ <del>Not</del> Applicable	YES/NO
8	Copy of PAN Card	Applicable/ <del>Not</del> Applicable	YES/NO
9	Whether all pages of the Tender documents including annexures, appendices etc are read understood and signed	Applicable/ <del>Not</del> Applicable	YES/NO
10	Integrity Pact	Applicable/ <del>Not</del> Applicable	YES/NO
11	Declaration by Authorised Signatory	Applicable/ <del>Not</del> Applicable	YES/NO
12	No Deviation Certificate	Applicable/ <del>Not</del> Applicable	YES/NO
13	Declaration confirming knowledge about Site Conditions	Applicable/ <del>Not</del> Applicable	YES/NO
14	Declaration for relation in BHEL	Applicable/ <del>Not</del> Applicable	YES/NO
15	Non Disclosure Certificate	Applicable/ <del>Not</del> Applicable	YES/NO
16	Bank Account Details for E-Payment	Applicable/ <del>Not</del> Applicable	YES/NO
17	Capacity Evaluation of Bidder for current Tender	Applicable/ <del>Not</del> Applicable	YES/NO
18	Tie Ups/Consortium Agreement are submitted as per format	Applicable/ <del>Not</del> Applicable	YES/NO

19	Power of Attorney for Submission of Tender/Signing Contract Agreement	Applicable/ <del>Not Applicable</del>	YES/NO
20	Analysis of Unit rates	Applicable/ <del>Not Applicable</del>	YES/NO

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

DATE :

**AUTHORISED SIGNATORY**  
(With Name, Designation and Company seal)

**ANNEXURE - 3**

**Certificate by Chartered Accountant on letter head**

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 on date..... 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

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.

Date:

(Signature)

Name -

Membership number -

Seal of Chartered Accountant

**ANNEXURE - 4****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.

**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	

**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

1<sup>st</sup> June

2012

# TECHNICAL CONDITION OF CONTRACT (TCC)

(Document No. PS: MSX:TCC)

BHARAT HEAVY ELECTRICALS LIMITED



# TECHNICAL CONDITIONS OF CONTRACT (TCC)

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## TECHNICAL CONDITION OF CONTRACT (TCC)

**TENDER NO. BHEL/NR/SCT/GADARWARA/ESP/UNIT 1&2/972**

**FOR**

**ERECTION, TESTING, COMMISSIONING, TRIAL OPERATION & HANDING OVER OF  
ELECTROSTATIC PRECIPITATOR (ESP) OF UNIT NO.1 & 2 AT 2X800 MW,  
GADARWARA STPS OF NTPC, GADARWARA.**

**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)

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<b>Sl. No.</b>	<b>DESCRIPTION</b>	<b>Chapter No.</b>	<b>Pages</b>
	<b>Part-I : Contract Specific Details</b>		
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	

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter-I: Project Information

Sl. No.	Title	Description
1.	Name of the Owner	<b>NATIONAL THERMAL POWER CORPORATION LTD. (NTPC)</b>
2.	Address	Gadarwara Thermal Power Station, near Chichli & Umaraiya villages, Tehsil – Gadarwara, District– Narsinghpur Madhya Pradesh, Pin- 487551
3.	New Installation	2 x 800 MW
4.	Nearest Railway station	Gadarwara Railway Station
5.	Nearest Road	Gadarwara is located on the MP SH 22
6.	Nearest City	Jabalpur
7.	Nearest Airport	Nearest Airport is Dumna Airport, Jabalpur-129 KM and Raja Bhoj Airport, Bhopal -209 KM
8.	Highest Temperature	45 deg C
9.	Lowest Temperature	1 deg C
10.	Elevation	354.77 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 BTG package and Mill bay structures & bunker of 2X800 MW Super Critical Thermal Power plant at Gadawara, M.P.by <b>National Thermal Power Corporation (NTPC).</b>
2.1	<b>Scope of Work :</b> The scope of work under this tender consists of following :
2.2	<b>(A) Service Portion (ESP)</b>
2.2.1	The scope of work under this tender consists of handling and transportation of equipments and materials for pre-assembly, erection, testing, commissioning and handing over of <b>Electrostatic Precipitator for Unit No.1 &amp; 2 at 2 x 800 MW Super Thermal Power Plant at Gadawara, M. P.</b>
2.2.2	<b>The scope of these specifications not limited to but covers mainly following:</b>
2.2.2.1	Taking delivery of the ESP materials from the project storage yard, stores, sheds to erection site.
2.2.2.2	Their preservation, safe keeping, watches and ward.
2.2.2.3	Checking, dressing, chipping and leveling of foundations.
2.2.2.4	Pre-assembly, erection, alignment of various equipments and grouting.
2.2.2.5	Welding, heat treatment, radiography, UT and other non-destructive tests wherever required
2.2.2.6	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.
2.2.2.7	Insulation and finish painting including supply of paints etc. for the entire equipments erected.
2.2.2.8	Works of all electrical, cabling and C&I
2.2.2.9	Unit trial operation, Resolving any deficiencies observed in ESP Unit- 1 & 2 of 2X800 MW Super Thermal Power Plant at Gadawara, M. P. up to handing over of the unit to BHEL and their customer including preparation for PG test of the unit.
2.2.3	The work shall conform to dimensions and tolerances given in various drawings and documents that will be provided during erection. If any portion of 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.

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter-II: Scope of Work

2.2.4	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.
2.2.5	<b>Approx. weight to be erected for the ESP shall be as indicated in Annexure-I. Accordingly, approx. weight to be erected shall be 24880 MT.</b>
2.3	<b>(B) Supply Portion (ESP)</b>
2.3.1	<b>Procurement of Paints</b> 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	<b>Note:</b>
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	<b>Separate order shall be issued for (A) Service portion(ESP) and (B) Supply Portion(paints).</b>
2.5	<b>SITE VISIT</b>
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	<b>SITE ORGANISATION</b>
2.6.1	The contractor shall provide adequate staffing in the following areas in addition to

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter-II: Scope of Work

	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.
2.6.1.3	Materials management.
2.6.1.4	Safety, fire & security.
2.6.1.5	Industrial relations and fulfillment 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	<b>ERECTION SCHEDULE</b>
2.7.1	<b>Contractor shall submit within 30 days of LOI date, detailed program (L2 schedule) of construction, erection and commissioning, indicating deployment of resources like T&amp;P and manpower, for approval to Site In-Charge or Project Manager-Noida.</b> 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

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter-II: Scope of Work

	form the basis for site execution and detailed monitoring, The three monthly rolling program with the first month's program being tentative based on the site conditions would be prepared based on these program. The Contractor shall also be involved along with the Customer/BHEL to tie up detailed resource mobilisation plan over the period of time of the contract matching with the performance 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 required during emergency including Ambulance.
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"><li>➤ Oxygen set up</li><li>➤ Breathing apparatus</li><li>➤ Eye wash facility</li><li>➤ Stretcher</li><li>➤ Trauma blanket</li><li>➤ Medicines.</li></ul>

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter-II: Scope of Work

	In addition to above, BHEL (through its other contractor) has arranged ambulance at work site for emergency purpose, which can be utilized by the contractor in case of emergency. The charges for the same will be decided mutually at site. In case, under unavoidable circumstances, if the ambulance is not available / being used elsewhere, the contractor will have to arrange for the same as under clause 9.1.5 of SCC.
2.10	<b>The contractor shall comply with following towards Social Accountability:</b>
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.

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

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<b>3.0</b>	<b>FACILITIES TO BE PROVIDED BY BHEL/ CONTRACTOR</b>			
<b>S.No.</b>	<b>Description</b>	<b>Scope /to be taken care by</b>		<b>Remarks</b>
		<b>BHEL</b>	<b>BIDDER</b>	
<b>3.1</b>	<b>ESTABLISHMENT</b>			
<b>3.1.1</b>	<b>FOR CONSTRUCTION PURPOSE</b>			
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
<b>3.1.2</b>	<b>FOR LABOUR COLONY</b>			
A	Open space		YES	Contractor have to make their own arrangement
<b>3.2</b>	<b>ELECTRICITY</b>			
<b>3.2.1.</b>	<b>Electricity for construction purposes (415 V) (chargeable/free)</b>			<b>Free of Cost</b>
3.2.1.1	Single point source	YES		

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

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3.2.1.2	Further distribution for the work to be done which include supply of materials & execution		YES	
<b>3.2.2</b>	<b>Electricity for the office, stores, etc of the bidder which include:</b>	<b>YES</b>		<b>Free of cost</b>
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	<b>Contractor have to make their own arrangement</b>
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	
<b>3.3</b>	<b>WATER SUPPLY</b>			
<b>3.3.1</b>	<b>FOR CONSTRUCTION:</b>			
3.3.1.1	Making the water available at single point		YES	<b>Contractor have to make bore wells itself, wherever approved by M/s NTPC</b>
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**

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<b>3.3.2</b>	<b>LABOUR COLONY:</b>			
3.3.2.1	Making the water available at single point		YES	<b>Contractor have to arrange on his own.</b>
3.3.2.2	Further distribution as per the requirement of work including supply of materials & execution		YES	
<b>3.4</b>	<b>LIGHTING</b>			
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	
<b>3.5</b>	<b>Communications facilities for site operations of the bidder</b>			
3.5.1	Telephone, fax , internet ,intranet, email etc.		YES	

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

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<b>3.6</b>	<b>COMPRESSED AIR SUPPLY</b>			
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	
<b>3.7</b>	<b>ERECTION FACILITIES</b>			
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**

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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	<b>Notes:</b>			
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

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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**

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<b>4.0</b>	<b><u>T&amp;P AND MMD DEPLOYED BY CONTRACTOR</u></b>		
<b>SI No.</b>	<b>Item Description</b>	<b>Capacity</b>	<b>Qty</b>
<b>4.1</b>	Crawler/Tyre mounted Crane	40T	2 No.
<b>4.2</b>	Hydra Crane	12 T / 14 T/18T	8 no
<b>4.3</b>	Trailer	20 T/ 30T cap	4 no
<b>4.4</b>	Winces of suitable capacity	2T/3T/5T/10T	APR**
<b>4.5</b>	Hand Operated Megger 500 / 1000 V	APR	APR
<b>4.6</b>	Tong Tester 10, 20 Or 50 Amp + / - 3 % Accuracy.	APR	APR
<b>4.7</b>	Digital and Analogue Multimeters	APR	APR
<b>4.8</b>	U Tube Manometer 0-2000 mm Water Column	APR	APR
<b>4.9</b>	Inclined Manometer 0-50 mm Water Column	APR	APR
<b>4.10</b>	Digital Clamp Meter (AC & DC type)	2000 Amp – 1000 Volt	1 No
<b>4.11</b>	Alco meter for paint thickness checking	APR	APR
<b>4.12</b>	Scaffolding Pipes with clamps	6 Meter Length	5000 Nos.
<b>4.13</b>	Welding sets with accessories and ovens for welding electrodes backing and holding	APR	APR
<b>4.14</b>	Air Compressor	140 CFM	01 No

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

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<b>4.15</b>	Chain pulley blocks and pulleys of suitable capacities		APR
<b>4.16</b>	Three phase distribution board with complete set for distribution of construction power	400 Amps	APR
<b>4.17</b>	Electric cables for distribution of construction power		APR
<b>4.18</b>	Torque Wrench		02 Nos.
	<p><b>**APR- As per requirement (Contractor shall have to deploy the T&amp;P whenever required at site as decided by BHEL ENGINEER)</b></p> <p><b>*The date of start of contract period shall be the mutually agreed date between the contractor and BHEL engineer to start the work &amp; this will be zero date for this contract. In case of discrepancy the decision of BHEL engineer is final.</b></p> <p><b># Deployment period of the T&amp;P shall be as per initial/modified mutually agreed plan during course of execution.</b></p>		
<b>4.19</b>	<b><u>NOTES</u></b>		
<b>4.19.1</b>	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 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.		
<b>4.19.2</b>	If works gets delayed due to non-availability of T&P and MMD, BHEL reserves the right to get work done at the risk & cost of contractor without prejudice to right of BHEL as in GCC.		
<b>4.19.3</b>	Contractor must re-ascertain/ recheck range and accuracy of each IMTE from BHEL Engineer well in advance before arranging calibration/ deployment.		

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

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<b>4.19.4</b>	Other terms and conditions regarding above items shall be as per T&P clause in SCC.
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**TECHNICAL CONDITIONS OF CONTRACT (TCC)**  
**Chapter-V: T&Ps and MMEs to be deployed by BHEL on sharing basis**

<b>5.0</b>	<b>T&amp;Ps TO BE DEPLOYED BY BHEL ON SHARING BASIS</b>			
<b>Sl. No.</b>	<b>Description &amp; Capacity of T &amp; P</b>	<b>Capacity</b>	<b>Qty</b>	<b>Remark</b>
<b>5.1</b>	<b>Crawler Crane</b>	<b>250T/ 135 T</b>	<b>1 No.</b>	<b>On sharing basis</b>
<b>5.2</b>	<b>Crawler / Tyre mounted Crane</b>	<b>75 T/ 100 T</b>	<b>1 No.</b>	<b>On sharing basis</b>
<b>5.3</b>	<b>Air Blower</b>	<b>Suitable capacity</b>	<b>1 No.</b>	
<b>5.4</b>	<b>Huck Bolting Machine</b>		<b>3 No.</b>	
<b>5.5</b>	<b>NOTES:</b>			
<b>5.5.1</b>	<b>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 &amp; BHEL owned cranes.</b>			
<b>5.5.2</b>	<b>The operator of 100 MT &amp; above cranes provided by BHEL, shall be arranged by BHEL free of cost. Crane Operator for BHEL's 75 T Crane will be arranged by the contractor. 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.</b>			
<b>5.5.3</b>	<b>Above Cranes will be provided on sharing basis on specific instruction of the BHEL Engineer as per the work requirement</b>			
<b>5.5.4</b>	<b>Steel plates, if required will be provided by BHEL free of hire charges. However, compacting of land wherever required shall be done by Contractor.</b>			
<b>5.5.5</b>	<b>The contractor shall make necessary arrangement like laying of steel plates, assembly &amp;dismantling of heavy lift attachment, boom, jib etc. for movement and operation of crane.</b>			

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

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<b>5.5.6</b>	<b>The spares of Huck Bolting Machines i.e. anvils, carbon brushes, nose assembly, jaw sets, trigger switch &amp; service kit for installation tools will be in contractor's scope.</b>
<b>5.5.7</b>	<b>In case of other T&amp;P mention above contractor shall transport from BHEL stores, install, operate, carry out maintenance, dismantle after use and return to BHEL stores.</b>

# TECHNICAL CONDITION OF CONTRACT (TCC)

## Chapter-VI: Time Schedule

<b>6.0</b>	<b>TIME SCHEDULE</b>														
<b>6.1</b>	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.														
<b>6.2</b>	<b>Contract Duration</b>														
<b>6.2.1</b>	Entire work as detailed in the tender specifications shall be completed within <b>28 MONTHS</b> from the Zero 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.														
<b>6.2.2</b>	<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><thead><tr><th><b>MILE STONES</b></th><th><b>MONTH</b></th></tr></thead><tbody><tr><td>ESP Erection Start</td><td>ZERO</td></tr><tr><td>Compl. Of Erection for BLU</td><td>17<sup>th</sup> Month</td></tr><tr><td>Steam Blowing</td><td>21<sup>st</sup> Month</td></tr><tr><td>Synchronization</td><td>23<sup>rd</sup> Month</td></tr><tr><td>Full Load</td><td>25<sup>th</sup> Month</td></tr><tr><td>Compl. Of Facilities</td><td>27<sup>th</sup> Month</td></tr></tbody></table>	<b>MILE STONES</b>	<b>MONTH</b>	ESP Erection Start	ZERO	Compl. Of Erection for BLU	17 <sup>th</sup> Month	Steam Blowing	21 <sup>st</sup> Month	Synchronization	23 <sup>rd</sup> Month	Full Load	25 <sup>th</sup> Month	Compl. Of Facilities	27 <sup>th</sup> Month
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Compl. Of Facilities	27 <sup>th</sup> Month														
<b>6.3</b>	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.														
<b>6.4</b>	The work under the scope of this contract is deemed to be complete in all respects, when the contractor has discharged all the responsibilities laid down in the contract. decision of BHEL on completion date shall be final and binding on the contractor.														

# TECHNICAL CONDITION OF CONTRACT (TCC)

## Chapter-VII: Terms of Payment

<b>7.0</b>	<b>TERMS OF PAYMENT</b>	
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	<b>Interest bearing recoverable advance : Applicable as per Clause No. 2.13 of GCC.</b>	
7.5	<b>PROGRESSIVE PAYMENT ON PRORATA BASIS (SERVICE PORTION)</b>	
7.5.1	<b>85 % of unit rates ( Applicable for ITEM. No. 12.4.1 of Rate Schedule)</b>	
<b>SL.No.</b>	<b>Rate Schedule Identification</b>	<b>ESP</b>
		<b>FOR ITEM NO.12.1 (ESP &amp; aux.)</b>
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,	5 %

# TECHNICAL CONDITION OF CONTRACT (TCC)

## Chapter-VII: Terms of Payment

	RECTIFIER TRANSFORMERS, PENT HOUSE MONO RAILS, HOISTS ETC	
7.5.1.7	ERECTION OF EMITTING AND COLLECTING RAPPING SYSTEM WITH ALL DRIVES	5 %
7.5.1.8	<b>TOTAL FOR PRO RATA PAYMENTS</b>	<b>85%</b>
<b>7.5.2</b>	<b>Milestone Payment (15%) – Service Portion</b>	
<b>SI No.</b>	<b>Rate Schedule Identification</b>	<b>ESP</b>
		<b>FOR ITEM NO.12.1 (ESP &amp; aux.)</b>
7.5.2.1	Air & Gas Tightness Test	6 X 0.25 %
7.5.2.2	Gas Distribution Test	6 X 0.25 %
7.5.2.3	Charging of ESP Fields	6 X 0.50 %
7.5.2.4	Coal Firing	1%
7.5.2.5	Full Load	1%
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	<b>TOTAL FOR STAGE/ MILESTONE PAYMENTS (15%)</b>	<b>15%</b>
7.6	<b>PAYMENT FOR SUPPLY PORTION</b>	
7.6.1	100% payment after completion of finish painting as certified by BHEL Engineer.	

# TECHNICAL CONDITION OF CONTRACT (TCC)

## Chapter-VIII: Taxes & Duties

8.0	<b>TAXES &amp; DUTIES (SERVICE PORTION-ESP)</b>
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 service &amp; services consumed and output service &amp; 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>Contractor has to make his own arrangement at his cost for completing the formalities with Sales Tax/ VAT authorities for bringing their plants and equipment at site for the execution of the work under this contract.</p> <p>However, provisions regarding <b>Service Tax</b> on output services and goods shall be as per following clauses.</p>
8.2	<b>Service Tax &amp; Cess on Service Tax</b>
8.2.1	Service Tax and Cess on Service Tax as applicable on output Services are excluded from contractor's scope; therefore contractor's price/rates shall be <b>exclusive</b> of Service Tax and Cess on Output Services.
8.2.2	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.
<b>8.2.3</b>	<b>For the purpose of claiming any Service Tax from BHEL, the following procedure shall be adopted :</b>
8.2.3.1	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:
8.2.3.1.1	The name, address and registration number of the contractor
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 payable thereon.

# TECHNICAL CONDITION OF CONTRACT (TCC)

## Chapter-VIII: Taxes & Duties

<b>8.2.4</b>	All the four conditions shall be fulfilled in the invoice for payment of Service Tax 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.
<b>8.2.5</b>	The Contractor shall be eligible for reimbursement of service tax provided the Service Tax invoice is raised and submitted with BHEL within 30 days from the completion of service, in line with Provisions of Rule 4A of the service tax rules, 1994.
<b>8.2.6</b>	<b>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.</b>  <b>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.</b>
<b>8.2.7</b>	<b>The bidder who do not accept and comply with above provisions, are liable to be rejected against this tender.</b>
<b>8.3</b>	<b>Modalities of Tax Incidence on BHEL</b>
<b>8.3.1</b>	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.
<b>8.4</b>	<b>New Taxes/Levies</b>
<b>8.4.1</b>	In case the Government imposes any new levy/tax on the output service/work after award of the contract, the same shall be reimbursed by BHEL at actual.
<b>8.4.2</b>	In case any new tax/levy/duty etc. becomes applicable after the date of Bidder's offer, the Bidder/Contractor must convey its impact on his price duly substantiated by documentary evidence in support of the same before opening of Price Bid. Claim for any such impact after opening the Price Bid will not be considered by BHEL for reimbursement of tax or reassessment of offer.
<b>8.4.3</b>	No reimbursement/recovery on account of increase/reduction in the rate of taxes, levies, duties etc. on input 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

# TECHNICAL CONDITION OF CONTRACT (TCC)

## Chapter-VIII: Taxes & Duties

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	of future variation if any, in rates of taxes/duties/ levies etc. in his price bid.
<b>8.5</b>	<b>TAXES &amp; DUTIES (SUPPLY PORTION)</b>
<b>8.5.1</b>	Contractor has to make his own arrangement at his cost for completing the formalities with Sales Tax/ VAT authorities for bringing their materials at site.
<b>8.5.2</b>	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.
<b>8.5.3</b>	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

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9.0	<b>Any other requirement</b>
9.1	NA

# TECHNICAL CONDITION OF CONTRACT (TCC)

## Chapter-X: Others

10.0	<b>IMPORTANT CONDITIONS</b>
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	<b>Modification/ deletion in Price Variation Compensation</b> Clause no. 2.17 of GCC:
10.2.1	<b>Clause No. 2.17.5 of GCC shall be modified as below:-</b>  Base date shall be the calendar month <b>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)</b>
10.2.2	<b>Clause No. 2.17.9 shall be modified as:-</b>  PVC shall be applicable only <b>for the extended period of contract (if any) after the schedule completion date.</b> 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, <b>no PVC shall be paid.</b>
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 20% 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	<b>All other terms &amp; conditions of Clause No. 2.17 of GCC shall remain same.</b>

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

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**Annexure-I**

**TENTATIVE WEIGHT SCHEDULE**

**SUMMARY OF WEIGHTS (ESP U1 & U2)**

<b>SN</b>	<b>Description</b>	<b>Wt</b>	<b>Unit</b>	<b>Annexure</b>
<b>1</b>	<b>ESP Material for Unit No. 1</b>	<b>12200</b>	<b>MT</b>	<b>IA</b>
<b>2</b>	<b>ESP Material for Unit No. 2</b>	<b>12200</b>	<b>MT</b>	<b>IB</b>
<b>3</b>	<b>Transformer Sets (For Unit No.1 &amp; 2)</b>	<b>480</b>	<b>MT</b>	<b>IC</b>
	<b>Total Weight (in MT)</b>	<b>24880</b>	<b>MT</b>	

# TECHNICAL CONDITION OF CONTRACT (TCC)

## Chapter-XI: Annexures

### Annexure- IA

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

<b>SNO</b>	<b>PGMA</b>	<b>Description</b>	<b>Estimate Wt (in Kg)</b>
1	79701	ROLL/SLIDE SUPPORTS	57000
2	79705	ESP-SUB-DELIVERY COMPO	1100
3	79706	INSULATOR HOUSING AS	92800
4	79708	GAS DIST. ASSY	101200
5	79709	GD-RAPPING MECHANISM	19200
6	79710	GD_DRIVE ARRANGEMENT	1400
7	79711	GAS SCREEN-EP	210200
8	79713	EMIT SYST SUSPENSION	33000
9	79714	SUPPORT INSULATORS	14400
10	79715	EMITTING ELECTRODES	47300
11	79716	EMIT ELECT RAPP MECH	62000
12	79717	DRIVE ARGT. FOR EMIT.	62100
13	79719	COL ELEC SUSPENSION	220000
14	79720	COLLECTING ELECTRODE	2077000
15	79721	EMIT SYS FRAME-TOP	217000
16	79722	EMIT SYS FRAME BOTOM	251000
17	79723	INSPECTION DOORS	36000
18	79724	SHOCK BARS	170600
19	79725	COLL ELECT RAPP MECH	155500
20	79726	COLL ELEC RAPP DRIVE	13800
21	79728	ESP ROOF PANELS	250000
22	79730	ELECTRICAL SD COMPTS	27700
23	79731	GEARED MOTORS FOR RAPP	42500
24	79732	EMIT SYS FRAME-MIDLE	358000
25	79737	JUNCTION BOX & PUSH BU	3200
26	79741	ELECTRICAL MISCELLANEO	5000
27	79742	OUTER ROOF-EP	300000
28	7975	HOPPER RIDGES	134000
29	79744	HOPPER UPPER PART	644000
30	79745	HOP MLD&LOWER PART	820000
31	79746	INSULATOR SUPP PANEL	173400
32	79747	ROOF PANEL ASSY	233700
33	79748	CASING STRUCTURE	655000
34	79749	CASING SHELL/PANEL	930000

# TECHNICAL CONDITION OF CONTRACT (TCC)

## Chapter-XI: Annexures

35	79750	INLET-OUTLET FUNNEL	250000
36	79755	PENT HOUSE FOR E P	210500
37	79757	SPLITTER&GUIDE VANES	41500
38	79759	CONTROL ROOM-INSERTS	39100
39	79760	CABLE-CABLE RACKS	261200
40	79761	EP PERF TEST EQUIPT	1300
41	79762	EARTHING,CABLE TRAYS,S	15700
42	79763	ASH LEVEL INDICATOR	4400
43	79764	MISCELLANEOUS ITEMS	15000
44	79765	APP PLATFORM-HOPPER	240000
45	79766	WATER WASHING SYSTEM	9000
46	79767	MIN WOOL FOR ESP INSUL	490000
47	79768	FIXING COMP. FOR ESP I	110400
48	79772	INTERLOCKS-EP	2500
49	79773	ELECTRICALLY OPERTD HO	11800
50	79774	OPACITY MONITOR & ACCE	1400
51	79778	BAPCON & ACCESSORIES	1200
52	79780	FOUNDATION MATLS FOR E	46500
53	79781	SUPPOTING STRUCTURES F	1205000
54	79790	HEATING ELEMENTS	1700
55	79791	PANEL TYPE HOPPER HEAT	45200
56	79792	AUXILIARY CONTROL PANE	51700
57	79794	STATCON PANEL	1800
58	79795	IOS PANEL	300
59	79988	COMMISSIONING SPARES	1300
60	79996	TOOLS & TACKLES	400
61	89610	EP GALLERIES&STAIRS	140000
62	89611	ESP ROOF HANDRAILS	16000
63	89612	FLOOR GRILL AND STEP T	91000
64	89613	FLOOR GRILL AND MOBILE	157100
65	89614	PENT HOUSE ROOFING SHE	76600
66	89615	INSULATION CLADDING SH	113300
		<b>TOTAL WEIGHT (IN KG)</b>	<b>12200000</b>
		<b>TOTAL WEIGHT (IN MT)</b>	<b>12200</b>

# TECHNICAL CONDITION OF CONTRACT (TCC)

## Chapter-XI: Annexures

### **Annexure-IB**

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

<b>SNO</b>	<b>PGMA</b>	<b>Description</b>	<b>Estimate Wt (in Kg)</b>
1	79701	ROLL/SLIDE SUPPORTS	57000
2	79705	ESP-SUB-DELIVERY COMPO	1100
3	79706	INSULATOR HOUSING AS	92800
4	79708	GAS DIST. ASSY	101200
5	79709	GD-RAPPING MECHANISM	19200
6	79710	GD_DRIVE ARRANGEMENT	1400
7	79711	GAS SCREEN-EP	210200
8	79713	EMIT SYST SUSPENSION	33000
9	79714	SUPPORT INSULATORS	14400
10	79715	EMITTING ELECTRODES	47300
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16	79722	EMIT SYS FRAME BOTOM	251000
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20	79726	COLL ELEC RAPP DRIVE	13800
21	79728	ESP ROOF PANELS	250000
22	79730	ELECTRICAL SD COMPTS	27700
23	79731	GEARED MOTORS FOR RAPP	42500
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25	79737	JUNCTION BOX & PUSH BU	3200
26	79741	ELECTRICAL MISCELLANEO	5000
27	79742	OUTER ROOF-EP	300000
28	7975	HOPPER RIDGES	134000
29	79744	HOPPER UPPER PART	644000
30	79745	HOP MLD&LOWER PART	820000
31	79746	INSULATOR SUPP PANEL	173400
32	79747	ROOF PANEL ASSY	233700
33	79748	CASING STRUCTURE	655000
34	79749	CASING SHELL/PANEL	930000
35	79750	INLET-OUTLET FUNNEL	250000

# TECHNICAL CONDITION OF CONTRACT (TCC)

## Chapter-XI: Annexures

36	79755	PENT HOUSE FOR E P	210500
37	79757	SPLITTER&GUIDE VANES	41500
38	79759	CONTROL ROOM-INSERTS	39100
39	79760	CABLE-CABLE RACKS	261200
40	79761	EP PERF TEST EQUIPT	1300
41	79762	EARTHING,CABLE TRAYS,S	15700
42	79763	ASH LEVEL INDICATOR	4400
43	79764	MISCELLANEOUS ITEMS	15000
44	79765	APP PLATFORM-HOPPER	240000
45	79766	WATER WASHING SYSTEM	9000
46	79767	MIN WOOL FOR ESP INSUL	490000
47	79768	FIXING COMP. FOR ESP I	110400
48	79772	INTERLOCKS-EP	2500
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50	79774	OPACITY MONITOR & ACCE	1400
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52	79780	FOUNDATION MATLS FOR E	46500
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54	79790	HEATING ELEMENTS	1700
55	79791	PANEL TYPE HOPPER HEAT	45200
56	79792	AUXILIARY CONTROL PANE	51700
57	79794	STATCON PANEL	1800
58	79795	IOS PANEL	300
59	79988	COMMISSIONING SPARES	1300
60	79996	TOOLS & TACKLES	400
61	89610	EP GALLERIES&STAIRS	140000
62	89611	ESP ROOF HANDRAILS	16000
63	89612	FLOOR GRILL AND STEP T	91000
64	89613	FLOOR GRILL AND MOBILE	157100
65	89614	PENT HOUSE ROOFING SHE	76600
66	89615	INSULATION CLADDING SH	113300
		<b>TOTAL WEIGHT (IN KG)</b>	<b>12200000</b>
		<b>TOTAL WEIGHT (IN MT)</b>	<b>12200</b>

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

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**Annexure-IC**

**Transformer Sets to be supplied from BHEL-Jhansi Unit**

<b>PGMA</b>	<b>Description</b>	<b>Qty</b>	<b>Estimate Wt (in MT)</b>
-	<b>TRANSFORMER SET (EACH WEIGHING 2 MT) FOR U#1 &amp; 2</b>	<b>240</b>	<b>480</b>
	<b>TOTAL WEIGHT (IN MT)</b>		<b>480</b>

**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 **24,880 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)

### ANNEXURE-A

<b>12.0</b>	<b><u>RATE SCHEDULE (UNPRICED)</u></b>	
<b>Item No.</b>	<b>DESCRIPTION OF WORK</b>	<b>Total Value In Rupees (In figures and words )</b>
<b>12.1</b>	<b>Total Lumpsum price for entire scope of handling, erection, testing, commissioning, trial operation and handing over of Electrostatic Precipitators of Unit No.1 &amp; 2 at 2x800 MW, NTPC Gadawara including auxiliaries, insulation, electrical, control and instrumentation etc &amp; final painting including Supply of paints as per tender specification.  (Approx. tonnage involved is 24880 MT )</b>	/
<b>12.2</b>	<b>Note:</b>	
<b>12.2.1</b>	<b>The amount for Supply of paints is restricted to 1% of the Total quoted price and included in the Lumpsum price.</b>	
<b>12.2.2</b>	<b>Separate orders shall be issued for Service portion (ESP) and Supply portion (paints).</b>	
<b>12.2.3</b>	The quantities indicated above are tentative and are liable to vary depending upon the site requirement. The contractor has to supplied / erect / commission all the items indicated by BHEL for achieving the milestones and completion of work.	
<b>12.2.4</b>	Evaluation of bids shall be done on total price against this Rate Schedule	
<b>12.2.5</b>	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)

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## TECHNICAL CONDITION OF CONTRACT (TCC)

**TENDER NO. BHEL/NR/SCT/GADARWARA/ESP/UNIT 1&2/972**

**FOR**

**ERECTION, TESTING, COMMISSIONING, TRIAL OPERATION & HANDING OVER  
OF ELECTROSTATIC PRECIPITATOR (ESP) OF UNIT NO.1 & 2 AT 2X800 MW,  
GADARWARA STPS OF NTPC, GADARWARA.**

**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)

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<b>SI</b>	<b>DESCRIPTION</b>	<b>Chapter No.</b>	<b>PAGES</b>
	<b>Part-II: Technical Specifications</b>		
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

<b>1.0</b>	<b>GENERAL</b>
<b>1.1</b>	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.
<b>1.2</b>	The contractor shall carry out the work in accordance with standard practices/ codes/ instructions/ drawings/ documents/ specification supplied by BHEL from time to time.
<b>1.3</b>	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.
<b>1.4</b>	Following shall be the responsibility of contractor and have to be provided within finally accepted rates/ prices:
<b>1.4.1</b>	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.
<b>1.4.2</b>	Proper out-turn as per BHEL plan and commitment.
<b>1.4.3</b>	Completion of work as per BHEL Schedule.
<b>1.4.4</b>	Good quality and accurate workmanship for proper performance of the equipment.
<b>1.4.5</b>	Repair and rectification.
<b>1.4.6</b>	Preservation/ Re-conservation of all components during storage/ erection/ commissioning till handing over.
<b>1.5</b>	<b>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.</b>

# TECHNICAL CONDITION OF CONTRACT (TCC)

## Chapter-II: Civil Works, Foundation & Grouting

<b>2.0</b>	<b>CIVIL WORKS, FOUNDATION, GROUTING</b>
<b>2.1</b>	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.
<b>2.2</b>	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.
<b>2.3</b>	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.
<b>2.4</b>	<b>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.</b> Arranging all labour, building materials including cement as applicable (ordinary Portland as well as Quick setting – free flow).
<b>2.4.1</b>	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
<b>2.4.2</b>	Non-shrink grout mix) prior to procurement and use.
<b>2.5</b>	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.
<b>2.6</b>	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**

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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  The
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

<b>3.0</b>	<b>ERECTION</b>
<b>3.1</b>	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:
<b>3.1.1</b>	Scaffolding and rigging operations,
<b>3.1.2</b>	Machine/ flame/ electric cutting, grinding, welding, radiography and stress relieving
<b>3.1.3</b>	Fitting, fettling, filing, straightening, chamfering chipping, scrapping, reaming, as cleaning, checking, leveling, blue matching, aligning and assembly.
<b>3.1.4</b>	Machining, surface grinding, drilling, doweling, shaping
<b>3.1.5</b>	Temporary erections for alignment, dismantling of certain equipment for checking, cleaning, servicing and site fabrication.
<b>3.2</b>	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.
<b>3.3</b>	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.
<b>3.4</b>	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.
<b>3.5</b>	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.
<b>3.6</b>	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.
<b>3.7</b>	The material for platform section shall be supplied in running meters. These shall be cut to size/ shape/ fabricated to required size/ shape and to be welded by contractor.
<b>3.8</b>	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.

# TECHNICAL CONDITION OF CONTRACT (TCC)

## Chapter-III: Erection

<b>3.9</b>	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.
<b>3.10</b>	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.
<b>3.11</b>	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.
<b>3.12</b>	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.
<b>3.13</b>	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.
<b>3.14</b>	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.
<b>3.15</b>	All <b>electrical cabling</b> 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.
<b>3.16</b>	The contractor at no extra cost to BHEL shall carry out servicing and realignment of skid mounted equipment.
<b>3.17</b>	All electrical panels, control gears, motors and such other devices shall be properly dried by heating to improve IR valve, before they are energized. Bearings, slip rings

# TECHNICAL CONDITION OF CONTRACT (TCC)

## Chapter-III: Erection

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	commutators and other exposed parts shall be protected against moisture ingress and corrosion during storage and periodically inspected.
<b>3.18</b>	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.
<b>3.19</b>	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.
<b>3.20</b>	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.
<b>3.21</b>	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.
<b>3.22</b>	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.

## TECHNICAL CONDITION OF CONTRACT (TCC)

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

4.0	<b>WELDING HEAT TREATMENT, RADIOGRAPHY AND NON-DESTRUCTIVE TESTING</b>
4.1	The pressure parts, equipment and piping shall be erected in conformity with the provisions of Indian Boiler Regulation and as may be directed by BHEL as per any standard/ specification in practice in BHEL. The method of welding (arc, gas, TIG or other method) may be indicated in the detailed drawings/ schedules. BHEL Engineer will have the option of changing the method of welding as per site requirements. Semi automatic welding (GMAW) process shall be used for non-pressure parts/ ducting/ structures etc to the maximum possible, considering its cost efficiency, better quality and time saving features.
4.2	Welding of pressure parts, equipment, piping, high tensile structural steel shall be done by certified high pressure welders who possess valid certificate of CIB of the State in which the equipment is erected as per provision of IBR. The H.P. welder who possesses necessary certificate shall ensure re-validation as per relevant provisions of IBR and keep the certificate valid till the completion of work. The services of such welders, the validity of whose certificates have expired shall not be utilized for high-pressure works.
4.3	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.
4.4	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 having passed qualification tests does not absolve the contractor of contractual obligation to continuously check the welder's performance.
4.5	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.
4.6	The contractor shall carry out the root run welding of all HP/ LP piping, valves by TIG welding method only. The contractor shall have to carry out full TIG welding of butt weld joints of tubes/ pipes of lesser thickness if required. During the root runs of stainless steel joints, the contractor shall before and during welding have to purge the pipes with inert gas. All weld joints for temporary piping required for alkali flushing, acid cleaning and steam blowing should be got done by HP welders only. The root run should be done by TIG welding. All arrangements required for the above shall be the responsibility of the contractor at no additional cost. Argon Purging is to be done for TIG Run of SS Pipes
4.7	All expenses for testing of contractor's welders including destructive and

## TECHNICAL CONDITION OF CONTRACT (TCC)

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

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	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.
4.8	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.
4.9	<b>Only BHEL/ BHEL's client approved electrodes and filler wires specifically approved / applicable to this project will be arranged and used by the contractor</b> , 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.
4.10	All butt/ fillet welds shall be subject to dye penetration test/ other tests as per the instructions of the engineer at no additional cost.
4.11	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.
4.12	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.
4.13	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.
4.14	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

## TECHNICAL CONDITION OF CONTRACT (TCC)

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

	process.
4.15	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:
4.15.1	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.
4.15.2	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.
4.15.3	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.
4.16	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.
4.17.	The technical particulars, specification and other general details for radiography work shall be in accordance with ASME, IBR or ISO as specified by BHEL.
4.18	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).
4.19	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.
4.20	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.
4.21	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.
4.22	Lead intensifying screens for front and back of the film should be used as per the above-referred ASME specification.
4.23	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.
4.24	For multiple exposures on pipes, an overlap of about 25-mm of film should be provided.
4.25	Radiography personnel with sufficient experience and certified by M/s BARC for

## TECHNICAL CONDITION OF CONTRACT (TCC)

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

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	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.
4.26	All arrangements for carrying out radiography work including dark room and air conditioner and other accessories shall be provided by contractor within the space allotted for office at his cost. As an alternative the contractor may deploy an agency having all above facilities and who are duly approved/ accredited by BARC and/ or other Regulatory authorities. Detailed particulars of such agencies will be submitted and got approved by BHEL Engineer before the actual deployment of agency for radiography work.
4.27	The contractor shall have a dark room fully equipped with radiography equipment, film (un-exposed), chemicals and any other dark room accessories.
4.28	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.
4.29	All the Radiographs shall be properly preserved and shall become the property of BHEL. They are to be reconciled with the work done, joints radiographed and submitted to BHEL/ customer.
4.30	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.
4.31	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.
4.32	Wherever radiographs are not accepted, on account of bad shot, joints shall be re-radiographed and re- submitted for evaluation.
4.33	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.
4.34	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.
4.35	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.

**TECHNICAL CONDITION OF CONTRACT (TCC)**  
**Chapter-IV: Welding, Heat-Treatment, Radiography and NDT**

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4.36	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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## TECHNICAL CONDITION OF CONTRACT (TCC)

### Chapter-V: Application of Refractory & Insulation

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5.0	<b>APPLICATION OF REFRACTORY &amp; INSULATION</b>
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. <b>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</b>
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

## TECHNICAL CONDITION OF CONTRACT (TCC)

### Chapter-V: Application of Refractory & Insulation

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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

**TECHNICAL CONDITION OF CONTRACT (TCC)**  
**Chapter-V: Application of Refractory & Insulation**

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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.

# TECHNICAL CONDITION OF CONTRACT (TCC)

## Chapter-VI: Painting including Finish painting

6.0	<b>PAINTING INCLUDING FINISH PAINTING</b>
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	<b>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.</b> 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

## TECHNICAL CONDITION OF CONTRACT (TCC)

### Chapter-VI: Painting including Finish painting

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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**

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7.0	<b>TESTING PRE-COMMISSIONING, COMMISSIONING AND POST-COMMISSIONING.</b>
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. Air leak test on pressure parts preliminary to hydraulic test by compressed air shall also be carried out to check and rectify the various leakage and defects etc.</p> <p>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>

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

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	Dismantling of the temporary equipment will be done by the agency that has erected the equipment. He will also return the equipment to the stores.
7.7	Commissioning of the ESP will involve trial run of all the equipment erected. 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

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	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 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.