

# **TENDER SPECIFICATION**

## **NO: BHE/PW/PUR/NGRIT-ESP+MMS/841**

MATERIAL HANDLING AND MANAGEMENT INCLUDING RECEIPT, UNLOADING, VERIFICATION, STACKING, PRESERVATION OF PROJECT MATERIALS OF ESP, LINING & INSULATION AND OTHER MATERIALS INCLUDING BHEL T&P, PROVIDING MATERIALS MANAGEMENT SERVICES ETC, COLLECTION OF MATERIALS FROM BHEL/ CLIENT'S STORES/ STORAGE YARD, TRANSPORTATION TO SITE OF WORK/PRE-ASSEMBLY YARD, ERECTION, TESTING, ASSISTANCE FOR COMMISSIONING & TRIAL OPERATION, HANDING OVER OF ESP PACKAGE INCLUDING, INSULATION, FINAL PAINTING ETC OF ESP PACKAGE FOR

2X660 MW JAPYEE NIGRIE SUPER THERMAL POWER PROJECT  
AT VILLAGE NIGRIE, DISTRICT SINGRAULI IN  
MADHYA PRADESH STATE

### **VOLUME – I**

#### **CONSISTING OF:**

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



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

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## **Tender Specification Issue Details**

### **Tender Specification No: BHE/PW/PUR/NGRIT-ESP+MMS/841**

MATERIAL HANDLING AND MANAGEMENT INCLUDING RECEIPT, UNLOADING, VERIFICATION, STACKING, PRESERVATION OF PROJECT MATERIALS OF ESP, LINING & INSULATION AND OTHER MATERIALS INCLUDING BHEL T&P, PROVIDING MATERIALS MANAGEMENT SERVICES ETC & COLLECTION OF MATERIALS FROM BHEL/ CLIENT'S STORES/ STORAGE YARD, TRANSPORTATION TO SITE OF WORK/PRE-ASSEMBLY YARD, ERECTION, TESTING, ASSISTANCE FOR COMMISSIONING & TRIAL OPERATION, HANDING OVER OF ESP PACKAGE INCLUDING, INSULATION, FINAL PAINTING ETC OF ESP PACKAGE FOR

2X660 MW JAPYEE NIGRIE SUPER THERMAL POWER PROJECT  
AT VILLAGE NIGRIE, DISTRICT SINGRAULI IN  
MADHYA PRADESH STATE

EARNEST MONEY DEPOSIT: Refer Notice Inviting Tender

LAST DATE FOR                      Refer Notice Inviting Tender  
TENDER SUBMISSION

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

M/s. ....

.....

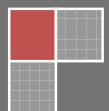
PLEASE NOTE:  
THESE TENDER SPECS DOCUMENTS ARE NOT TRANSFERABLE.

For Bharat Heavy Electricals Limited

AGM (Purchase)  
Place: Nagpur  
Date:

# NOTICE INVITING TENDER

Bharat Heavy Electricals Limited



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

=====

To

Dear Sir/Madam

**Sub: NOTICE INVITING TENDER**

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

**1.0 Salient Features of NIT**

| SL NO | ISSUE                      | DESCRIPTION  |            |
|-------|----------------------------|--|------------|
| i     | TENDER NUMBER              | BHE/PW/PUR/NGRIT-ESP+MMS/841   |            |
| ii    | Broad Scope of job         | MATERIAL HANDLING AND MANAGEMENT INCLUDING RECEIPT, UNLOADING, VERIFICATION, STACKING, PRESERVATION OF PROJECT MATERIALS OF ESP, LINING & INSULATION AND OTHER MATERIALS INCLUDING BHEL T&P, PROVIDING MATERIALS MANAGEMENT SERVICES ETC, AND COLLECTION OF MATERIALS FROM BHEL/ CLIENT'S STORES/ STORAGE YARD, TRANSPORTATION TO SITE OF WORK/PRE-ASSEMBLY YARD, ERECTION, TESTING, ASSISTANCE FOR COMMISSIONING & TRIAL OPERATION, HANDING OVER OF ESP PACKAGE INCLUDING, INSULATION, FINAL PAINTING ETC OF ESP PACKAGE FOR 2X660 MW JAPYEE NIGRIE SUPER THERMAL POWER PROJECT AT VILLAGE NIGRIE, DISTRICT SINGRAULI IN MADHYA PRADESH STATE |            |
| iii   | DETAILS OF TENDER DOCUMENT |  |            |
| a     | Volume-IA                  | Technical Conditions of Contract (TCC) consisting of Scope of work, Technical Specification, Drawings, Procedures, Bill of Quantities, Terms of payment, etc   | Applicable |

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|      |  |  |                 |
|------|--|--|-----------------|
| b    | Volume-IB  | Special Conditions of Contract (SCC)   | Applicable      |
| c    | Volume-IC  | General Conditions of Contract (GCC)   | Applicable      |
| d    | Volume-ID  | Forms and Procedures   | Applicable      |
| e    | Volume-II  | Price Schedule (Absolute value).   | Applicable      |
| iv   | Issue of Tender Documents                                      | <p>1. <b><u>Sale from BHEL PS Regional office at :Nagpur</u></b><br/> <b>Start : 23/03/2011</b><br/> <b>Closes: 05/04/2011, Time :16.00 Hrs</b></p> <p>2. <b>From BHEL website (<a href="http://www.bhel.com">www.bhel.com</a>)</b><br/> Tender documents can however be downloaded from website till due date of submission</p>   | Applicable      |
| v    | DUE DATE & TIME OF OFFER SUBMISSION                            | <p><b>Date : 06/04/ 2010 , Time :15.00Hrs</b><br/> <b>Place : <u>BHEL PS Regional office at :Nagpur</u></b><br/> Tenders being submitted through representative shall be handed over to any of the following BHEL officials after making entry/registration at the reception:<br/> SM Borkar/ Sr Manager (Purchase)<br/> RK Ranade/ Manager (Purchase)<br/> Pratish Gee Varghese/Engineer(Purchase)</p>            | Applicable      |
| vi   | OPENING OF TENDER  | <p><b>1 hours after the latest due date and time of Offer submission</b><br/> Notes:<br/> (1) In case the due date of opening of tender becomes a non-working day, tenders shall be opened on next working day at the same time.<br/> (2) Bidder may depute representative to witness the opening of tender</p>  | Applicable      |
| vii  | EMD AMOUNT   | Rs 2,00,000/- (Rupees Two Lakhs Only)  | Applicable      |
| viii | COST OF TENDER   | Rs 2000/-.   | Applicable      |
| ix   | LAST DATE FOR SEEKING CLARIFICATION                            | <p>Date: Atleast 5 days before the due date of offer submission<br/> Along with soft version also, addressing to undersigned &amp; to others as per contact address given below</p>  | Applicable      |
| x    | SCHEDULE OF Pre Bid Discussion (PBD)                           | Date : Not applicable.   | Not applicable. |
| xi   | INTEGRITY PACT & DETAILS OF INDEPENDENT EXTERNAL MONITOR (IEM) | Not Applicable   | Not Applicable  |
| xii  | Latest updates   | <p>Latest updates on the important dates, Amendments, Correspondences, Corrigenda, Clarifications, Changes, Errata, Modifications, Revisions, etc to Tender Specifications will be hosted in BHEL webpage (<a href="http://www.bhel.com">www.bhel.com</a> --&gt;Tender Notifications →View Corrigendums) <b><u>and not in the newspapers</u></b>. Bidders to keep themselves updated with all such information</p> |                 |

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- 2.0 The offer shall be submitted as per the instructions of tender document and as detailed in this NIT. Bidders to note specifically that all pages of tender document, including these NIT pages of this particular tender together with subsequent correspondences shall be submitted by them, duly signed & stamped on each page, as part of offer. **Rates/Price including discounts/rebates, if any, mentioned anywhere/in any form in the techno-commercial offer other than the Price Bid, shall not be entertained.**
- 3.0 Unless specifically stated otherwise, bidder shall remit cost of tender and courier charges if applicable, in the form of Demand Draft drawn in favour of Bharat Heavy Electricals Ltd, payable at Power Sector Regional HQ at Nagpur issuing the Tender, along with techno-commercial offer. Bidder may also choose to deposit the Tender document cost by cash at the Cash Office as stated above against sl no iv of 1, on any working day; and in such case copy of Cash receipt is to be enclosed with the Techno Commercial offer. Sale of tender Documents shall not take place on National Holidays, holidays declared by Central or State Governments and BHEL PS HQ at Nagpur, Sundays and second/ last Saturdays
- 4.0 Unless specifically stated otherwise, bidder shall deposit EMD through Demand Draft/Pay Order in favour of Bharat Heavy Electricals Ltd, payable at Nagpur. For other details and for 'One Time EMD' please refer General Conditions of Contract.
- 5.0 **Procedure for Submission of Tenders:** The Tenderers must submit their Tenders to Officer inviting Tender, as detailed below:
- PART-I consisting of 'PART-I A (Techno Commercial Bid)' & 'PART-I B (EMD/COST of TENDER)' in two separate sealed and superscribed envelopes (ENVELOPE-I & ENVELOPE-II)
  - PART-II (Price Bid) – in sealed and superscribed envelope (ENVELOPE-III)
- 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>   |         |
|       | <b>ENVELOPE – I superscribed as :</b><br>PART-I (TECHNO COMMERCIAL BID)<br>TENDER NO :<br>NAME OF WORK :<br>PROJECT:<br>DUE DATE OF SUBMISSION:<br><br><b>CONTAINING THE FOLLOWING:-</b>  |         |
| i.    | Covering letter/Offer forwarding letter of Tenderer.  |         |
| ii.   | Duly filled-in 'No Deviation Certificate' as per prescribed format to be placed after document under Sl no (i) above.<br><br><b>Note:</b> <ol style="list-style-type: none"> <li>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.</li> <li>b. BHEL reserves the right to accept/reject the deviations without assigning any reasons, and BHEL decision is final and binding.               <ol style="list-style-type: none"> <li>i). In case of acceptance of the deviations, appropriate loading shall be done by BHEL</li> </ol> </li> </ol> |         |

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|       |   |               |
|-------|---|---------------|
|       | ii). In case of unacceptable deviations, BHEL reserves the right to reject the tender   |               |
| iii.  | Supporting documents/ annexure/ schedules/ drawing etc as required in line with Pre-Qualification criteria.<br><br>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. |               |
| 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>  |  |
|    | <b><u>ENVELOPE – II superscribed as:</u></b><br>PART-I (EMD/COST of TENDER)<br>TENDER NO :<br>NAME OF WORK :<br>PROJECT:<br>DUE DATE OF SUBMISSION:<br><br><b><u>CONTAINING THE FOLLOWING:-</u></b>  |  |
| i. | 1. Earnest Money Deposit (EMD) in the form as indicated in this Tender<br><br><b><u>OR</u></b><br>Documentary evidence for 'One Time EMD' with the Power Sector Region of BHEL floating the Tender<br><br>2. Cost of Tender ( Demand Draft or copy of Cash Receipt as the case may be) |  |

|  |   |  |
|--|---|--|
|  | <b>PART-II</b>  |  |
|  | <b>PRICE BID</b> consisting of the following shall be enclosed  |  |
|  | <b><u>ENVELOPE-III</u></b><br>superscribed as:<br>PART-II (PRICE BID)<br>TENDER NO :<br>NAME OF WORK :<br>PROJECT:<br>DUE DATE OF SUBMISSION: |  |



|    |  |  |
|----|--|--|
|    | <b>CONTAINING THE FOLLOWING</b>  |  |
| 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>  |  |
|   | <b>ENVELOPE-IV (MAIN ENVELOPE / OUTER ENVELOPE)</b><br>superscribed as:<br>TECHNO-COMMERCIAL BID, PRICE BID & EMD<br>TENDER NO:<br>NAME OF WORK:<br>PROJECT:<br>DUE DATE OF SUBMISSION: |  |
|   | <b>CONTAINING THE FOLLOWING:</b>  |  |
| 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 No Deviation with respect to tender clauses and no additional clauses/ suggestions/ in Techno-commercial bid/ Price bid shall normally 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 as per the following:**

i. **Assigning Weightages (A) for Similar Jobs Under-Execution:** Weightages shall be worked out and assigned based on the average number of Similar Works under execution including works yet to be commenced by the agency, in the following manner:

i). **Number of Similar Jobs**

- a) No. of jobs in BHEL, PSER : Say 'J'
- b) No. of jobs in BHEL, PSSR : Say 'K'
- c) No. of jobs in BHEL, PSWR : Say 'L'
- d) No. of jobs in BHEL, PSNR : Say 'M'
- e) No. of jobs with other customers\* : Say 'N' (\*: Other than BHEL PSER, PSSR, PSWR & PSNR)
- f) Average No. of Jobs is 'P' = (J+K+L+M+N) divided by 5

ii) **Weightage "A" assigned to bidders based on Average Number of jobs "P":**

- a) If 'P' = 0-1, "A" will be equal to '3'
- b) If 'P' = 2-3, "A" will be equal to '2'
- c) If 'P' = 4-5, "A" will be equal to '1'
- d) If 'P' is Above 5, "A" will be equal to '0'

- II. **Weightage “B” for Quarterly Performance Reports of Vendors:** This shall be based on the averages of the net weighted score obtained by the bidder for the jobs under execution (excluding works not commenced) for the quarter previous to the last quarter reckoned from the date of latest due date of submission, in all four Regions i.e. BHEL PSER, PSSR, PSWR & PSNR, in the following manner.

- i). **Ratings by Power Sector Region:**
- a) PS ER's Rating 'Rer' =  $(X_1 + X_2 + \dots + X_n)$  divided by n
  - b) PS WR's Rating 'Rwr' =  $(X_1 + X_2 + \dots + X_n)$  divided by n
  - c) PS SR's Rating 'Rsr' =  $(X_1 + X_2 + \dots + X_n)$  divided by n
  - d) PS NR's Rating 'Rnr' =  $(X_1 + X_2 + \dots + X_n)$  divided by n
  - e) **Over all Power Sector Region Rating 'R<sub>BHEL</sub>'** =  $(Rer + Rwr + Rsr + Rnr)$  divided by 4

(where “X<sub>1</sub>, X<sub>2</sub>, X<sub>3</sub>,...X<sub>n</sub>” is the net weighted score obtained by the bidder as per the “Evaluation of Contractor Performance (Quarterly)” against the various contracts ‘n’ under execution in the respective Region).

- ii) **Weightage “B” assigned to bidders based on Overall Power Sector Rating (R<sub>BHEL</sub>):**

- a) If R<sub>BHEL</sub> is 80% and above, “B” will be equal to ‘6’
- b) If R<sub>BHEL</sub> is > 70% < 80%, “B” will be equal to ‘5’
- c) If R<sub>BHEL</sub> is > 60% < 70%, “B” will be equal to ‘4’
- d) If R<sub>BHEL</sub> is < 60%, “B” will be equal to ‘0’

- III. **Evaluation of Bidders capacity to execute the job under tender:** shall be based on the sum of scores obtained in ‘A’ and ‘B’, as below:

- a) **6 or above : Considered ‘Qualified’ for the job under tender**
- b) **Less than 6: Considered ‘NOT Qualified’ for the job under tender**

- IV. **Explanatory note:**

- a) Similar work means Boiler or Turbine or Civil or Electrical or CI, etc irrespective of rating of Plant
- b) Quarter shall be as per the quarter defined in the “Evaluation of Contractor performance (Quarterly)”. For contracts where annexed Quarterly Evaluation performance was not part of the contract, ‘Quarterly Performance Reports’ previous to the last quarter reckoned from the date of latest due date of submission, given by the respective project site against the contract will be the basis for evaluation.
- c) Vendors who are not executing any jobs presently in the Region and first timers to the Region, may be considered subject to satisfying all other tender conditions
- d) ‘Under execution’ shall mean works in progress upto Boiler Steam Blowing (for Boiler and Auxiliaries) or Synchronization (for all other jobs including Civil) shall be considered.

- 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

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& order situation 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. No additional claim shall be entertained by BHEL in future, on account of non-acquaintance of above.

- 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 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 (xi) of 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 pre-qualification evaluation/ techno-commercial bids, approval/ acceptance of customer (as applicable), etc. and date of opening of price bids shall be intimated to only such bidders.
- 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) or specified otherwise in SCC of tender.
- 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

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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 In case Consortium Bidding is allowed as per Pre Qualifying Requirement, then Prime Bidder and Consortium Partner shall enter into Consortium Agreement. Validity period of Consortium Agreement shall be 6 months after which the same can be re validated.
- 'Stand alone' bidder cannot become a '**prime bidder**' or a '**consortium bidder**' in a **consortium bidding**. Prime bidder shall neither be a consortium partner to other prime bidder nor take any other consortium partners. However, consortium partner may enter into consortium agreement with other prime bidders. In case of non compliance, consortium bids of such Prime bidders will be rejected. .
- 24.0 The bidder shall submit documents in support of possession of 'Qualifying Requirements' duly self certified and stamped by the authorized signatory, indexed and properly linked in the format for PQR. In case BHEL requires any other documents/proofs, these shall be submitted immediately.
- 25.0 The bidder may have to produce original document for verification if so decided by BHEL.
- 26.0 Order of Precedence  
In the event of any ambiguity or conflict between the Tender Documents, the order of precedence shall be in the order below:
- a. Amendments/Clarifications/Corrigenda/Errata etc issued in respect of the tender documents by BHEL
  - b. Notice Inviting Tender (NIT)
  - c. Price Bid
  - d. Technical Conditions of Contract (TCC)—Volume-1A
  - e. Special Conditions of Contract (SCC) —Volume-1B
  - f. General Conditions of Contract (GCC) —Volume-1C
  - g. Forms and Procedures —Volume-1D

For BHARAT HEAVY ELECTRICALS LTD

AGM (Purchase)

**Enclosure**

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

**ANNEXURE - 1**

**PRE QUALIFYING CRITERIA**

|           |  |
|-----------|--|
| JOB       | MATERIAL HANDLING AND MANAGEMENT INCLUDING RECEIPT, UNLOADING, VERIFICATION, STACKING, PRESERVATION OF PROJECT MATERIALS OF ESP, LINING & INSULATION AND OTHER MATERIALS INCLUDING BHEL T&P, PROVIDING MATERIALS MANAGEMENT SERVICES ETC, COLLECTION OF MATERIALS FROM BHEL/ CLIENT'S STORES/ STORAGE YARD, TRANSPORTATION TO SITE OF WORK/PRE-ASSEMBLY YARD, ERECTION, TESTING, ASSISTANCE FOR COMMISSIONING & TRIAL OPERATION, HANDING OVER OF ESP PACKAGE INCLUDING, INSULATION, FINAL PAINTING ETC OF ESP PACKAGE FOR 2X660 MW JAPYEE NIGRIE SUPER THERMAL POWER PROJECT AT VILLAGE NIGRIE, DISTRICT SINGRAULI IN MADHYA PRADESH STATE |
| TENDER NO | <b>BHE/PW/PUR/NGRIT-ESP+MMS/841</b>  |

| SL<br>N<br>O | PRE QUALIFICATION CRITERIA  | Bidders claim in respect of fulfilling the PQR Criteria |                                |
|--------------|---|---|--------------------------------|
|              |   | Name and Description of qualifying criteria             | Page no of supporting document |
| A            | Submission of Integrity Pact duly signed (if applicable)  | <b>NOT APPLICABLE</b>                                   |                                |
| B            | Assessment of Capacity of Bidder to execute the work as per SI no 9 of NIT (if applicable)  | <b>APPLICABLE</b>                                       |                                |
| C            | <b><u>Technical</u></b><br>c) Bidder must have, achieved any one of the following:<br><b>c.1)</b> Bidder must have, in last seven years as on 28/02/2011, executed Erection, Testing and Commissioning (Upto Coal Firing of the unit or beyond) of atleast one ESP (Electrostatic Precipitator) of a 190 MW or higher rated Coal Based Thermal Power Plant.<br><b>c.2)</b> Bidder must have, in last seven years as on 28/02/2011, executed Erection, Testing and Commissioning (Upto Boiler Light-up of the unit or beyond) of atleast one Coal Fired Boiler of 190 MW or higher rating.<br><b>c.3)</b> Bidder should have been Techno-Commercially Qualified for E & C works of ESP of 660 MW or higher rated unit in last 3 years as on 28/02/2011 by any power sector region of BHEL. |   |                                |
| D<br>1       | <b><u>Financial TURNOVER</u></b><br>Bidders must have achieved an average annual financial turnover (Audited) of <b>Rs 585 Lakhs</b> or more over last three Financial Years (FY) i.e. 2007-08, 2008-2009, 2009-2010  |   |                                |

**BHEL PSWR**  
**Notice Inviting Tender**

**Tender Specification No: BHE/PW/PUR/NGRIT-ESP+MMS/841**

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|   |   |                       |  |
|---|---|-----------------------|--|
| 2 | <b>NETWORTH</b><br>Net worth of the Bidder based on the latest Audited Accounts as furnished for 'D1' above should be positive  |                       |  |
| 3 | <b>PROFIT</b><br>Bidder must have earned cash profit in any one of the three Financial Years as applicable in the last three years defined in 'D1' above based on latest Audited Accounts.  |                       |  |
|   |   |                       |  |
| E | <b>Approval of Customer (if applicable)</b><br>Note: Names of bidders who stand qualified after compliance of criteria A to D shall be forwarded to customer for their approval. Price bid of only those bidders shall be opened who are approved by customer.  | <b>APPLICABLE</b>     |  |
| F | <b>Consortium criteria (if applicable)</b>  | <b>NOT APPLICABLE</b> |  |
|   | <b>Explanatory Notes for QR 'A'</b><br>1. The word 'executed' means the bidder should have achieved the criteria specified in the QR even if the total contract has not been completed or closed<br>2. Bidder to submit Audited Balance Sheet and Profit and Loss Account for the respective years as given above along with all annexures<br>(a) <del>The word 'executing' means</del> _____ |                       |  |

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

**CHECK LIST ANNEXURE - 2**

**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  | Details of Contact person for this Tender  | Name : Mr./Ms<br>Designation:<br>Telephone No:<br>Mobile No:<br>Fax No:   |                   |
| 4  | EMD DETAILS  | DD No:                      Date :<br>Bank :                      Amount:<br><u>Please tick ( ✓ ) whichever applicable:-</u><br>ONE TIME EMD / ONLY FOR THIS TENDER |                   |
|    |  | APPLICABILITY   | BIDDER<br>REPLY   |
| 5  | 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          |
| 6  | Whether Audited profit and Loss Account for the last three years submitted   | Applicable  | YES/NO            |
| 7  | Whether Copy of PAN Card submitted   | Applicable  | YES/NO            |
| 8  | Whether all pages of the Tender documents including annexures, appendices etc are read understood and signed   | Applicable  | YES/NO            |
| 9  | Integrity Pact   | Not<br>Applicable   | Not<br>Applicable |
| 10 | Declaration by Authorised Signatory  | Applicable  | YES/NO            |
| 11 | Whether No Deviation Certificate submitted   | Applicable  | YES/NO            |
| 12 | Whether Declaration confirming knowledge about Site Conditions submitted   | Applicable  | YES/NO            |
| 13 | Whether Declaration for relation in BHEL submitted   | Applicable  | YES/NO            |
| 14 | Whether Non Disclosure Certificate submitted   | Applicable  | YES/NO            |
| 15 | Whether Bank Account Details for E-Payment submitted   | Applicable  | YES/NO            |
| 16 | Capacity Evaluation of Bidder for current Tender Refer SI 9 of NIT   | Applicable  | YES/NO            |
| 17 | Tie Ups/Consortium Agreement are submitted as per format   | Not<br>Applicable   | Not<br>Applicable |
| 18 | Whether Power of Attorney for Submission of Tender/Signing Contract Agreement submitted  | Applicable  | YES/NO            |
| 19 | Whether Analysis of Unit rates submitted   | Applicable  | YES/NO            |

NOTE: STRIKE OFF 'YES' OR 'NO', AS APPLICABLE

**DATE:**  
**SIGNATORY**

**AUTHORISED**

(With Name, Designation and Company seal)

## IMPORTANT INFORMATION

1. It is a combined Tender Specification for the job of ESP and Material Handling & Material Management as detailed in the specification hence forth.
2. Rates for Material Handling & Material Management has been fixed by BHEL as detailed in Section A of Volume II Price Bid Specifications.
3. Bidders shall not quote separate rates for the scope of Material Handling and Material Management
4. Bidders shall quote their rates for the scope of Erection, Testing and Commissioning of ESP in Section B of Volume II Price Bid Specification.
5. For the ease of operations of contract 'definition of start of work' and 'contract period' for the job of ESP and Material Handling & Management has been specified separately in Chapter VI of Volume I A Technical Conditions of Contract.
6. Refer Clause 2.17 of Volume I C 'General Conditions of Contract' (Price Variation Compensation): For the purpose of calculating PVC, following 'Commodities shall be reckoned for the respective categories:

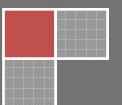
| "Category"                            | Category/Commodity to be Used for PVC Calculation |
|---------------------------------------|---|
| Electrode                             | <b>Welding Rod</b> (Individual Commodity)         |
| High Speed Diesel                     | <b>High Speed Diesel</b> (Individual Commodity)   |
| Cement                                | <b>Grey cement</b> (Individual Commodity)         |
| Structural & Reinforcement Steel      | <b>a1. Iron &amp; semis</b> (Group Item)          |
| Materials (Other than Cement & Steel) | <b>All Commodities</b> (Group Item)               |

**Note: For calculation of PVC, subject contract shall be treated as a 'Mechanical Package'**



# TECHNICAL CONDITIONS OF CONTRACT (TCC)

BHARAT HEAVY ELECTRICALS  
LIMITED



# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## CONTENTS

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| SI No            | DESCRIPTION   | Chapter      | No. OF PAGES |
|------------------|---|--------------|--------------|
| <b>Volume-IA</b> | <b>Part-I: Contract specific details</b>                  |              |              |
| 1                | Project Information                                       | Chapter-I    | 2            |
| 2                | Scope of Works  | Chapter-II   | 3            |
| 3                | Facilities in the scope of Contractor/BHEL (Scope Matrix) | Chapter-III  | 7            |
| 4                | T&Ps and MMEs to be deployed by Contractor                | Chapter-IV   | 3            |
| 5                | T&Ps and MMEs to be deployed by BHEL on sharing basis     | Chapter-V    | 1            |
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| <b>Volume-IA</b> | <b>Part-II : Technical Specifications</b>                 |              |              |
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NOTE: ONE NUMBER DRAWING IS ATTACHED AT THE END OF VOLUME IA

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter - I: Project Information

|            |   |
|------------|---|
| <b>1.0</b> | <b>Project Information</b>  |
| <b>1.1</b> | <p><b>INTROUCTION</b></p> <p><b>JAIPRAKASH POWER VENTURES LTD</b> is going to install 2X660MW JAYPEE Nigrie Super Thermal Power Plant at village Nigri, District Singrauli, Madhya Pradesh, India. BHEL has been awarded ESP Package comprising of Design, Engineering, Manufacture, Supply, Transportation, Comprehensive Insurance, Erection, Testing and Commissioning, and Conducting Performance Guarantee (PG) Test of both Units and handing over of the project within 38 months from Zero date / 09.06.2010.</p> <p><b>Site information</b></p> <p>a) Location : Near Village Nigrie<br/>Dist : Singrauli<br/>State : Madhya Pradesh</p> <p>b) Longitude : 81°53' 50" E to 81°55' 6" E</p> <p>c) Latitude : 24°8' 25" N to 24°10' 2" N</p> <p>d) Nearest Railway Station : Niwas Road R. S. (8 Kms from project site on Katni – Singrauli section of West-Central Railway)</p> <p>e) Nearest Village : Nigrie<br/>Dist : Singrauli<br/>State : Madhya Pradesh</p> <p>f) Nearest Seaport : Vizag</p> <p>g) Nearest Airport : Varanasi in U.P.</p> <p>h) Access Road : The Site is well connected with the National Highway NH-7 running at Sidhi between Sidhi &amp; Rewa at a distance of 40 Kms from the site. Also there is a district road connecting Sidhi &amp; Nigrie.</p> |
| <b>1.2</b> | <p><b><u>CLIMATIC CONDITIONS</u></b></p> <p><b>1. Seismic data</b></p> <p>a. Seismic Intensity : As per IS: 1893-2002</p> <p>b. Zone : II</p>   |

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter - I: Project Information

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**THE BIDDER IS ADVISED TO VISIT AND EXAMINE THE SITE OF WORKS AND ITS SURROUNDINGS AND OBTAIN FOR HIMSELF ON HIS OWN RESPONSIBILITY ALL INFORMATION THAT MAY BE NECESSARY FOR PREPARING THE BID AND ENTERING INTO THE CONTRACT. ALL COSTS FOR AND ASSOCIATED WITH SITE VISITS SHALL BE BORNE BY THE BIDDER.**

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter - II: Scope of Works

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### 2.0 SCOPE OF WORK

THE WORK TO BE CARRIED OUT UNDER THE SCOPE OF THESE SPECIFICATIONS IS BROADLY AS UNDER: -

### **2.0 A – SCOPE OF WORK OF MATERIAL HANDLING AND MATERIALS MANAGEMENT SERVICES**

THE SCOPE OF WORK OF THIS TENDER SPECIFICATION FOR MATERIAL HANDLING AND MATERIALS MANAGEMENT SERVICES FOR ESP PACKAGE 2X660 MW JAPYEE NIGRIE SUPER THERMAL POWER PROJECT AT VILLAGE NIGRIE, DISTRICT SINGRAULI IN MADHYA PRADESH STATE SHALL BE BROADLY AS UNDER:

- UNLOADING OF ALL TYPES OF CONSIGNMENTS DIRECTLY FROM TRAILORS/WAGONS BY SUITABLE CRANE OR BY JACK AND SLEEPER METHOD (ALL TO BE ARRANGED BY THE CONTRACTOR), INCLUDING LEVELLING OF THE UNLOADING AREA AND ATTENDANT WORK.
- RECEIPT OF MATERIALS DISPATCHED BY ROAD TRANSPORT ON DOOR DELIVERY BASIS AT THE BHEL STORES AND UNLOADING THEREOF.
- COLLECTION OF MATERIALS DISPATCHED BY ROAD TRANSPORT/ RAIL ON GODOWN DELIVERY BASIS FROM TRANSPORTERS'/RAILWAY GODOWNS, LOADING AT TRANSPORTERS'/ RAILWAY GODOWN, LOCAL TRANSPORT UP TO BHEL STORES/ STORAGE YARD AND UNLOADING THEREOF.
- PRELIMINARY VERIFICATION OF MATERIALS AT THE TIME OF UNLOADING FROM ROAD TRANSPORT VEHICLE OR WHILE RECEIVING CONSIGNMENTS FROM RAILWAY/ TRANSPORTERS' GODOWN - AS THE CASE MAY BE, REPORTING IMMEDIATELY THE DISCREPANCIES LIKE DAMAGES AND SHORTAGES NOTICED.
- DETAILED VERIFICATION OF MATERIALS WITH REFERENCE TO PACKING LIST AND LOADING ADVICE SLIP AFTER UNPACKING OF BOXES & CRATES; REPACKING, WHERE CALLED FOR, AFTER DETAILED VERIFICATION; PREPARATION OF RECEIPT INSPECTION REPORTS.
- STACKING AND STORING AT BHEL OPEN STORAGE YARD/ COVERED STORES/ CLOSED & SEMI-CLOSED SHEDS, SUBMISSION OF STACKING/STORING RECORDS.

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter - II: Scope of Works

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- PRESERVATION OF THE MATERIALS IN ACCORDANCE WITH BHEL'S PRESERVATION MANUAL AND/OR AS PER BHEL'S INSTRUCTIONS.
- GENERAL CLEANING, GRASS CUTTING AND UPKEEP OF STORAGE YARD, COVERED AND SEMI-CLOSED STORES SHEDS WITHIN THE QUOTED RATES FOR UNLOADING, VERIFICATION AND STACKING.
- PROVIDING MATERIALS MANAGEMENT SERVICES AS SPECIFIED IN RELEVANT CHAPTER
- REHANDLING AND RESTACKING OF MATERIALS AS AND WHEN CALLED FOR BY BHEL. THIS ALSO INCLUDES EXCESS/REDUNDANT/ SCRAP MATERIALS RETURNED TO STORES BY BHEL'S CONSTRUCTION & ERECTION CONTRACTORS.
- HANDLING AND LOADING OF OUTGOING MATERIALS THOSE ARE TO BE SENT TO OTHER DESTINATIONS.

### **2.0 B: SCOPE OF WORK OF ERECTION TESTING & COMMISSIONING**

THE SCOPE OF WORK OF THIS TENDER SPECIFICATION FOR COLLECTION OF MATERIALS FROM BHEL/ CLIENT'S STORES/ STORAGE YARD, TRANSPORTATION TO SITE OF WORK/PRE-ASSEMBLY YARD, ERECTION, TESTING, ASSISTANCE FOR COMMISSIONING & TRIAL OPERATION, HANDING OVER OF ESP PACKAGE INCLUDING, INSULATION, FINAL PAINTING ETC FOR ESP PACKAGE 2X660 MW JAPYEE NIGRIE SUPER THERMAL POWER PROJECT AT VILLAGE NIGRIE, DISTRICT SINGRAULI IN MADHYA PRADESH STATE SHALL BE BROADLY AS UNDER:

- 1) COLLECTION OF MATERIALS FROM BHEL/CLIENT'S STORES/STORAGE YARD; TRANSPORTATION TO SITE, ERECTION ,TESTING & ASSISTANCE FOR COMMISSIONING, TRIAL OPERATION AND HANDING OVER OF ELECTROSTATIC PRECIPITATOR, INSULATION, FINAL PAINTING ETC. OF. ESP PACKAGE 2X660 MW JAPYEE NIGRIE SUPER THERMAL POWER PROJECT AT VILLAGE NIGRIE, DISTRICT SINGRAULI IN MADHYA PRADESH STATE
- 2) ERECTION, ALIGNMENT AND WELDING, BOLTING, FASTENING, GROUTING AS APPLICABLE OF:
  - ✓ ELECTROSTATIC PRECIPITATOR AND STAIRWAYS & GALLERIES
- 3) PRE-ASSEMBLY, IF ANY, PRE-ERECTION CHECKS AS APPLICABLE
- 4) E&C WORK OF ELECTRICAL AND C&I ITEMS IN THE SUPPLY SCOPE OF BHEL UNITS AND ASSOCIATED TO ESP

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter - II: Scope of Works

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- 5) INSULATION OF ALL EXPOSED METAL PARTS OF THE EQUIPMENTS INCLUDING, STRUCTURES ETC.
- 6) PRE-COMMISSIONING CHECKS/TESTS, TRIAL RUNS/TESTING AND COMMISSIONING
- 7) FINAL PAINTING OF ERECTED ITEMS
- 8) TRIAL OPERATION AND ASSOCIATED TESTS
- 9) MAKING UNIT READY FOR PG TEST AND ASSISTANCE FOR CONDUCTANCE.
- 10) COMPLETION OF ALL FACILITIES/SYSTEMS
- 11) HANDING OVER OF THE UNIT

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

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



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

| Sl. No | Description<br><b>PART I</b>   | Scope / to be taken care by |        | Remarks  |
|--------|--|-----------------------------|--------|--|
|        |  | BHEL                        | Bidder |  |
| b      | Labour Colony with internal roads, sanitation, complying with statutory requirements           |                             | Yes    |  |
| 3.2.0  | <b>ELECTRICITY</b>   |                             |        |  |
| 3.2.1  | <b>Electricity For construction purposes</b> of Voltage 415/440 V                              |                             |        | FREE   |
| a      | Single point source  | Yes                         |        | At a distance of 1000 M from site (Distance is only estimated, it may vary upto an extent depending on site condition) |
| b      | Further distribution including all materials, Energy Meter, Protection devices and its service |                             | Yes    |  |
| c      | Duties and deposits including statutory clearances if applicable                               |                             | Yes    |  |
| 3.2.2  | <b>Electricity for the office, stores, canteen etc of the bidder</b>                           |                             |        | Chargeable as per standard rate  |
| a      | Single point source  | Yes                         |        | At a distance of 500 M from site (Distance is only estimated, it may vary upto an extent depending on site condition)  |

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

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

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

| Sl. No | Description<br><b>PART I</b>   | Scope / to be taken care by |        | Remarks |
|--------|--|-----------------------------|--------|---------|
|        |  | BHEL                        | Bidder |         |
| 3.3.2  | Water supply for bidder's office, stores, canteen etc.   |                             |        | FREE    |
| a      | Making the water available at single point   | Yes                         |        |         |
| b      | Further distribution as per the requirement of work including supply of materials and execution  |                             | Yes    |         |
| 3.3.3  | <b><u>Water supply for Living Purpose</u></b>  |                             |        |         |
| a      | Making the water available at single point   |                             | Yes    |         |
| b      | Further distribution as per the requirement of work including supply of materials and execution  |                             | Yes    |         |
| 3.4.0  | <b>LIGHTING</b>  |                             |        |         |
| a      | For construction work (supply of all the necessary materials)<br>1. At office/storage area<br>2. At the preassembly area<br>3. At the construction site /area        |                             | Yes    |         |
| b      | For construction work (execution of the lighting work/ arrangements)<br>1. At office/storage area<br>2. At the preassembly area<br>3. At the construction site /area |                             | Yes    |         |

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

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

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

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

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

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| Sl. No | Description<br><br><b>PART II</b><br><br><b>3.9.0 ERECTION FACILITIES</b>   | Scope / to be taken care by |        | Remarks |
|--------|---|-----------------------------|--------|---------|
|        |   | BHEL                        | Bidder |         |
| i      | Periodic visit of the senior official of the bidder to site to review the progress so that works are completed as per schedule. It is suggested this review by the senior official of the bidder should be done once in every two months. |                             | Yes    |         |
| j      | Preparation of preassembly bay  |                             | Yes    |         |
| k      | Laying of racks for gantry crane if provided by BHEL or brought by the contractor/bidder himself  |                             | Yes    |         |
| L      | Arranging the materials required for preassembly  |                             | YES    |         |

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

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

| SN | DESCRIPTION OF EQUIPMENT  | CAPACITY              | MINIMUM QUANTITY | REMARKS   |
|----|---|-----------------------|------------------|---|
| 01 | CRAWLER CRANE   | 40 T                  | 02               | 01 No. TO BE DEPLOYED FROM BEGINNING FOR START OF MATERIAL HANDLING TILL COMPLETION<br>01 No. TO BE DEPLOYED FROM BEGINNING FOR START OF ERECTION TILL COMPLETION |
| 02 | CRAWLER/TYRE-MOUNTED CRANE  | 18 T                  | 01               | TO BE DEPLOYED FROM BEGINNING FOR START OF MATERIAL HANDLING TILL COMPLETION  |
| 03 | PICK AND CARRY CRANE  | 12 T                  | 02               | TO BE DEPLOYED FROM BEGINNING FOR START OF MATERIAL HANDLING TILL COMPLETION  |
| 04 | TRAILER WITH HORSE  | 15 TON - 20 TON       | 01               | TO BE DEPLOYED FROM BEGINNING FOR START OF MATERIAL HANDLING TILL COMPLETION  |
| 05 | AIR COMPRESSOR (ELECTRIC)   | 140 CFM               | 01               | TO BE DEPLOYED AT APPROPRIATE STAGE OF WORK AS PER INSTRUCTION OF BHEL ENGINEER   |
| 06 | SELF DRILLING CUM TAPPING MACHINE FOR SCREWS OF FLOOR GRILL & ROOF SHEETING                           | AS REQUIRED           | 02               | TO BE DEPLOYED AT APPROPRIATE STAGE OF WORK AS PER INSTRUCTION OF BHEL ENGINEER   |
| 07 | 3 ph DISTRIBUTION BOARD WITH COMPLETE SET UP FOR DRAWING CONSTRUCTION POWER, FITTED WITH ENERGY METER | AS Required           | As required      | AS REQUIRED AND AS PER INSTRUCTION OF BHEL ENGINEER   |
| 08 | WELDING GENERATOR (ELECTRIC & DIESEL)   | 300 AMPS              | AS REQUIRED      | TO BE DEPLOYED PROGRESSIVELY AS PER INSTRUCTION OF BHEL ENGINEER  |
| 09 | ELECTRIC WINCH  | 1 TON / 2 TON / 3 TON | 08 (TOTAL)       | TO BE DEPLOYED PROGRESSIVELY AS PER INSTRUCTION OF BHEL ENGINEER  |

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

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

|    |   |  |             |  |
|----|---|--|-------------|--|
| 10 | ELECTRIC CABLE FOR DRAWAL & DISTRIBUTION OF CONSTRUCTION POWER  | AS REQUIRED  | AS REQUIRED | TO BE DEPLOYED FROM BEGINNING OF START OF MATERIAL HANDLING TILL COMPLETION  |
| 11 | BAKING OVEN AND HOLDING OVEN WITH THERMOSTAT AND TEMPERATURE GAUGE FOR BAKING COATED WELDING ELECTRODES | AS REQUIRED  | 01 SET EACH | TO BE DEPLOYED AT APPROPRIATE STAGE OF WORK AS PER INSTRUCTION OF BHEL ENGINEER  |
| 12 | PORTABLE OVEN FOR COATED WELDING ELECTRODES   | AS REQUIRED  | 05 SET      | TO BE DEPLOYED PROGRESSIVELY AS PER INSTRUCTION OF BHEL ENGINEER   |
| 13 | TRAILER WITH PRIME MOVER  | ADEQUATE CAPACITY  | AS REQUIRED | WHILE FURNISHING THE DEPLOYMENT PLANS FOR THESE ITEMS, THE NEED FOR TRANSPORT OF MATERIAL RECD ON GODOWN DELIVERY BASIS IS TO BE KEPT IN VIEW.<br>VEHICLES DEPLOYED SHOULD HAVE VALID STATUTORY DOCUMENTS AT ALL TIMES   |
| 14 | TRUCK   | 9 MT   | 1 NO        |  |
| 15 | CONCRETE SLEEPERS   | Assorted sizes 3 FT length, 6 Inch width and 6 Inch height | 7000 Nos    | DEPLOYMENT SCHEDULE FROM START OF WORK: BY THE END OF 1ST MONTH- CUMULATIVE - 2000 NOS,<br>BY THE END OF 2ND MONTH CUMULATIVE 4000 NOS CUM,<br>BY THE END OF 3RD MONTH CUMULATIVE -7000 NOS<br>TO CONTINUE TILL COMPLN OF WORK. CONTRACTOR SHALL TAKE OUT ALL SUCH SLEEPERS AT THE END OF CONTRACT AND LEAVE THE PROJECT PREMISES CLEAN. |
| 16 | WOODEN SLEEPERS   | Assorted sizes 3 FT length, 6 Inch width and 6 Inch height | 100 Nos     | BY THE END OF SECOND MONTH FROM START OF WORK  |



# TECHNICAL CONDITIONS OF CONTRACT (TCC)

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

|    |  |             |                |                   |
|----|--|-------------|----------------|-------------------|
| 17 | SLINGS, 'D'-SHACKLES,<br>HYDRAULIC JACKS, ETC. | AS REQUIRED | AS<br>REQUIRED | WITH TEST REPORTS |
|----|--|-------------|----------------|-------------------|

**IN CASE THE CONTRACTOR DOES NOT DEPLOY OR DELAYS DEPLOYMENT OF MAJOR T&P WITH REFERENCE TO SCHEDULE SPECIFIED ABOVE TABLE, BHEL WILL RECOVER NON-REFUNDABLE PENALTY PER DAY OF DELAY IN THE FOLLOWING MANNER:**

- |   |                 |
|---|-----------------|
| 1. IN RESPECT OF EACH 40 MT CRANE:      | @ RS. 4,000 / - |
| 2. IN RESPECT OF EACH 18 MT CRANE:      | @ RS. 3,000 / - |
| 3. IN RESPECT OF EACH 12 MT CRANE:      | @ RS. 1,000 / - |
| 4. IN RESPECT OF PER CONCRETE SLEEPERS: | @ RS. 5 / -     |
| 5. IN RESPECT OF PER WOODEN SLEEPERS:   | @ RS. 10 / -    |

### MEASURING AND MONITORING DEVICES (MMD):

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

### NOTE:

- 1) ALL THE TOOLS AND PLANTS REQUIRED FOR THIS SCOPE OF WORK, EXCEPT THE TOOLS & PLANTS PROVIDED BY BHEL ARE TO BE ARRANGED BY CONTRACTOR WITHIN THE QUOTED RATES. THE LIST IS SUGGESTIVE IN NATURE. ANY ADDITIONAL T&P REQUIRED TO BE ARRANGED BY THE CONTRACTOR.
- 2) IF ABOVE MENTIONED T & P ARE NOT DEPLOYED IN SPECIFIED TIME BHEL WILL CHARGE TO CONTRACTOR CURRENT MARKET RATE + 30 % OVERHEADS FOR NON AVAILABILITY T&P OR LEVY A DAY WISE PENALTY FOR NON DEPLOYMENT OR DELAYED DEPLOYMENT.
- 3) IF THE WORKS GET DELAYED DUE TO NON-AVAILABILITY OF T&P, BHEL RESERVES THE RIGHT TO GET THE WORK DONE AT THE RISK AND COST OF CONTRACTOR WITHIN PREJUDICE TO RIGHTS OF BHEL AS IN GCC.
- 4) THE MANUFACTURING YEAR OF ALL MAJOR T&PS DEPLOYED BY THE CONTRACTOR (40 MT, CRAWLER CRANE, 18 MT MOBILE CRANE AND 12MT PICK & CARRY CRANE) SHOULD NOT BE MORE THAN 10 YEARS AS ON THE DATE OF DEPLOYMENT. IF AT ANY MOMENT OF TIME DURING THE EXECUTION OF WORK, ANY CRANE IS FOUND TO BE NOT IN A GOOD WORKING CONDITION AND NON-PERFORMING AT DESIRED MINIMUM CAPACITY, AS CERTIFIED BY BHEL ENGINEER, THE CONTRACTOR SHALL DEPLOY ANOTHER CRANE IN GOOD WORKING CONDITION WITH MINIMUM DESIRED CAPACITY. IF CONTRACTOR FAILS TO DEPLOY THE SAME WITH IN 10 DAYS, BHEL WILL RECOVER NON-REFUNDABLE PENALTY PER DAY OF DELAY IN THE FOLLOWING MANNER -
 

|                                    |                 |
|------------------------------------|-----------------|
| 1. IN RESPECT OF EACH 40 MT CRANE: | @ RS. 4,000 / - |
| 2. IN RESPECT OF EACH 18 MT CRANE: | @ RS. 3,000 / - |
| 3. IN RESPECT OF EACH 12 MT CRANE: | @ RS. 1,000 / - |

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter – V: T&Ps and MMEs to be deployed by BHEL on sharing basis

| SN | DESCRIPTION AND CAPACITY OF T&P   | QUANTITY | REMARKS   |
|----|---|----------|---|
| 01 | CRAWLER CRANE 100 T   | 01 NO.   | THIS CRANE WILL BE PROVIDED FROM BEGINNING FOR START OF ERECTION          |
| 02 | CRAWLER CRANE 150 T/180 T   | 01 SET   | THIS CRANE WILL BE PROVIDED AFTER 3 MONTHS FROM START OF ERECTION         |
| 03 | HUCK BOLTING MACHINE COMPLETE SET WITH ACCESSORIES, CONSUMABLES AND SPARES AS NEEDED FOR NORMAL OPERATION | 01 SET   | NIL   |
| 04 | AIR LEAK TEST EQUIPMENT MACHINE WITH ALL ACCESSORIES  | 01 SET   | POWER CABLE FOR AIR LEAK TEST EQUIPMENT TO BE PROVIDED BY THE CONTRACTOR. |

**NOTE:**

1. THESE CRANES ARE OWNED OR HIRED BY BHEL. OPERATOR FOR BHEL OWNED CRANE SHALL BE ARRANGED BY BHEL.
2. CONTRACTOR SHALL MAKE NECESSARY ARRANGEMENTS LIKE LYING OF SPECIAL SLEEPER BEDS AND STEEL PLATES (ALL ARRANGED BY CONTRACTOR), ASSEMBLY AND DISMANTLING OF HEAVY LIFT ATTACHMENT, BOOM, JIB ETC FOR MOVEMENT AND OPERATION OF THE CRANE
3. BHEL MAY OBTAIN THESE CRANES ON HIRING BASIS INCLUDING OPERATING AND MAINTENANCE CREW.
4. OPERATORS FOR HIRED CRANE WILL BE PROVIDED BY THE HIRING AGENCY.
5. CONTRACTOR SHALL PROVIDE THE FUEL FOR BHEL PROVIDED CRANES FOR HIS USE.
6. CRANES PROVIDED BY BHEL WILL BE ON SHARING BASIS WITH OTHER AGENCIES / CONTRACTORS OF BHEL. THE ALLOCATION OF CRANES SHALL BE THE DISCRETION OF BHEL ENGINEER, WHICH SHALL BE BINDING ON THE CONTRACTOR. CRANES WILL BE DEPLOYED AT APPROPRIATE TIME AS DECIDED BY BHEL FOR SUITABLE DURATION AND INTENDED PURPOSE.

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter – VI: Time Schedule

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### 6.1 TIME SCHEDULE & MOBILIZATION

#### 6.1.1 INITIAL MOBILIZATION

After receipt of fax LOI, Contractor shall discuss with Project Manager / Construction Manager regarding initial mobilization. Contractor shall mobilize necessary resources within 2 weeks of issue of fax letter of intent or as per the directive of Project Manager / Construction Manager. Such resources shall be progressively augmented to match the schedule of milestones and commissioning.

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

The activities for erection, testing etc. shall be started as per directions of Construction Manager of BHEL. Contractor shall mobilize further resources (in addition to those required for activities under clause no. 6.1.1) as per requirement to commence the work of erection, testing etc. of ESP and progressively augment the resources to match schedule of the project.

#### 6.1.3 COMMENCEMENT OF CONTRACT PERIOD AND TENTATIVE SCHEDULE

##### 6.1.3.A

#### **COMMENCEMENT OF CONTRACT PERIOD AND TENTATIVE SCHEDULE FOR MATERIAL HANDLING AND MATERIALS MANAGEMENT SERVICES**

The contract period for completion of entire work of Material Handling & Material Management under this scope shall be **28 (twenty eight) months from the “Start of contract period for material handling and materials management services”**.

The date of receipt / unloading the very first consignment by the contractor as defined in scope of this contract shall be reckoned as the “start of the contract period for material handling and materials management services”.

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

##### 6.1.3.B

#### **COMMENCEMENT OF CONTRACT PERIOD AND TENTATIVE SCHEDULE FOR ERECTION, TESTING, ASSISTANCE FOR COMMISSIONING ETC.**

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter – VI: Time Schedule

Erection/placement on its designated foundation / location, of the first major permanent equipment / component / column covered in the scope of these specifications shall be recognized as **“Start of contract period for erection, testing, assistance for commissioning etc ”**. Smaller items like packer plates, shims, anchors, inserts etc. will not be considered as start of contract period.

The Contractor has to subsequently augment his resources in such a manner that following major milestones of erection & commission are achieved on specified schedules:

According to the contract between BHEL and Owner the schedule of important milestones is as follows:

### Major L1 milestones for Unit 1 & 2

| SL No. | Milestones                           | UNIT – 1            | UNIT – 2 |
|--------|--------------------------------------|---------------------|----------|
|        | <b>Zero Date</b>                     | <b>09- June -10</b> |          |
| 1      | Start of Erection of field 1&2       | Jun-11              | Dec-11   |
| 2      | Start of Erection of field 3&4       | July-11             | Jan-12   |
| 3      | Start of Erection of field 5&6       | Aug-11              | Feb-12   |
| 4      | Erection Completion for BLU          | Aug-12              | Feb-13   |
| 5      | Balance Erection Completion          | Oct-12              | Apr-13   |
| 6      | Testing and Commissioning Completion | Dec-12              | Jun-13   |
| 7      | Trial Operation                      | Feb-12              | Aug-13   |
|        |                                      |                     |          |

In order to meet above schedule in general, and any other intermediate targets set, to meet customer/ project schedule requirements, Contractor shall arrange & augment all necessary resources from time to time on the instructions of BHEL.

The contract period for completion of entire work of ESP under this scope shall be **26 (Twenty Six months)** from the **“Start of contract period for erection, testing, assistance for commissioning etc”** as specified earlier.

The period from the commencement of preparatory work for erection till the actual “start of contract period” shall not be reckoned for the above purpose.

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter-VII: Terms of Payment

The progressive payment for Material Handling and Management Services on accepted price of contract value (**Rate schedule SECTION A**) will be released as per the break up given hereinafter:

| SL NO          | Description of Activity  | % of payment |
|----------------|--|--------------|
| <b>7.1.1.0</b> | <b>UNLOADING FROM TRUCKS/TRAILERS (For item nos A &amp; D of Rate Schedule SECTION A)</b>  |              |
| 7.1.1.1        | UNLOADING, SHIFTING TO OPEN/ COVERED STORES  | 30%          |
| 7.1.1.2        | UPDATION OF RECEIPT DETAILS, IN STORE MATERIAL REGISTERS/BHEL MM PACKAGE SYSTEM  | 15%          |
| 7.1.1.3        | STACKING AND VERIFICATION  | 15%          |
| 7.1.1.4        | UPDATION OF VERIFICATION DETAILS IN MATERIAL STOCK REGISTERS, SUBMISSION OF REPORTS AS PER SPECIFIED FORMATS FOR SHORTAGE/OPEN DELIVERY, LODGING OF POLICE REPORTS IF REQUIRED, DOCUMENTS FOR INSURANCE CLAIMS ETC, AND PREPARATION OF MATERIAL RECEIPT CERTIFICATES IN PRESCRIBED FORMATS WHERE EVER APPLICABLE | 25%          |
| 7.1.1.5        | IDENTIFICATION OF MATERIAL IN READY TO LIFT POSITION FOR ISSUE TO BHEL/ERECTION AGENCY, AND UPDATION OF ISSUE DETAILS IN STORES RECORDS  | 12%          |
| 7.1.1.6        | COMPLETION OF CONTRACTUAL OBLIGATIONS  | 3%           |
|                | Total  | 100%         |
| <b>7.1.2.0</b> | <b>UNLOADING FROM RAILWAY WAGONS AND COLLECTION FROM TRANSPORTER GODOWN (For item B &amp; C of Rate Schedule SECTION A)</b>  |              |
| 7.1.2.1        | UNLOADING FROM RAILWAY WAGONS OR COLLECTION FROM TRANSPORTER GODOWNS, RE-LOADING, TRANSPORTATION TO SITE AND UNLOADING   | 30%          |
| 7.1.2.2        | UPDATION OF RECEIPT DETAILS, IN STORE MATERIAL REGISTERS/BHEL MM PACKAGE SYSTEM  | 15%          |

BHEL-PSWR

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# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter-VII: Terms of Payment

|         |   |      |
|---------|---|------|
| 7.1.2.3 | STACKING AND VERIFICATION   | 15%  |
| 7.1.2.4 | UPDATION OF VERIFICATION DETAILS IN MATERIAL STOCK REGISTERS, SUBMISSION OF REPORTS AS PER SPECIFIED FORMATS FOR SHORTAGE/OPEN DELIVERY, LODGING OF POLICE REPORT IF REQUIRED, DOCUMENTS FOR INSURANCE CLAIMS ETC, AND PREPARATION OF MATERIAL RECEIPT CERTIFICATES IN PRESCRIBED FORMATS WHERE EVER APPLICABLE | 25%  |
| 7.1.2.5 | IDENTIFICATION OF MATERIAL IN READY TO LIFT POSITION FOR ISSUE TO BHEL/ERECTION AGENCY, AND UPDATION OF ISSUE DETAILS IN STORES RECORDS   | 12%  |
| 7.1.2.6 | COMPLETION OF CONTRACTUAL OBLIGATIONS   | 3%   |
| 7.1.3.0 | <b>MATERIAL RE-SHIFTING/RE STACKING WITHIN THE PROJECT PREMISE<br/>(For item E of Rate Schedule SECTION A)</b>  |      |
| 7.1.3.1 | MATERIAL RE-SHIFTING/RE STACKING  | 85%  |
| 7.1.3.2 | UPDATION OF STORE MATERIAL REGISTERS/BHEL MM PACKAGE SYSTEM   | 12%  |
| 7.1.3.3 | COMPLETION OF CONTRACTUAL OBLIGATIONS   | 3%   |
|         | Total   | 100% |
| 7.1.4.0 | <b>OUTGOING MATERIALS ( For item F of Rate Schedule SECTION A)</b>  |      |
| 7.1.4.1 | IDENTIFICATION OF MATERIALS, TAGGING, PACKING IF REQUIRED, PREPARATION OF GATE PASSES ETC   | 40%  |
| 7.1.4.2 | LOADING OF MATERIALS, INCLUDING T&P OF BHEL, INTO TRUCKS/CARRIERS AT SITE STORES/ERECTION SITE FOR ONWARD TRANSPORTATION TO OTHER DESTINATIONS (TRANSPORTATION BY OTHER AGENCIES.)  | 45%  |
| 7.1.4.3 | UPDATION OF STORE DOCUMENTS/BHEL MM PACKAGE SYSTEM  | 12%  |
| 7.1.4.4 | COMPLETION OF CONTRACTUAL OBLIGATIONS   | 3%   |

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# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter-VII: Terms of Payment

|         |   |      |
|---------|---|------|
|         | Total   | 100% |
| 7.1.5.0 | <b>OTHERS</b>   |      |
|         | <b>% from every RA Bill to be paid only after satisfactory completion otherwise forfeited</b> |      |
| 1       | REMOVAL OF GRASS/WEEDS AND OTHER PLANT GROWTH IN THE STORE AREA                               | 1%   |
| 2       | PRESERVATION planned for the month  | 1%   |
| 3       | Safe working & availability of adequate illumination at the place of work                     | 1%   |

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter-VII: Terms of Payment

The progressive payment for Erection, Testing and Commissioning on accepted price of contract value (Rate Schedule SECTION B) will be released as per the break up given hereinafter:

| <b>TERMS OF PAYMENT FOR ERECTION TESTING AND COMMISSIONING (Rate schedule SECTION B)</b> |  |            |  |
|--|--|------------|--|
| SL NO  | <b>Contract (Main Package) Identification ----&gt;</b>   | <b>ESP</b> | <b>INSULATION</b>                          |
|  | <b>Rate schedule Identification -----&gt;</b>  | <b>ESP</b> | 2) Fixing components<br>3) Wool mattresses |
| <b>I</b>   | <b>PRO RATA PAYMENTS (85%)</b>   |            |  |
| 1.1  | ON PRE-ASSEMBLY WHEREVER APPLICABLE ( IF NOT APPLICABLE, THIS PORTION SHALL BE CLUBBED WITH PLACEMENT IN POSITION) | 15         | --   |
| 1.2  | PLACEMENT IN POSITION  | 20         | 50   |
| 1.3  | ALIGNMENT  | 15         | 15   |
| 1.4  | WELDING/BOLTING/FIXING   | 20         | 20   |
| 1.15   | COMPLETION OF HOPPERS ALONG WITH ALL DOORS, HEATING ELEMENTS, POKING DOORS, ETC                                    | 5          | --   |
| 1.16   | COMPLETION OF INNER, OUTER ROOF INSULATOR HOUSING, RECTIFIER TRANSFORMERS, PENT HOUSE MONO RAILS, HOISTS ETC       | 5          | --   |
| 1.17   | ERECTION OF EMITTING AND COLLECTING RAPPING SYSTEM WITH ALL DRIVES   | 5          | --   |
|  | <b>TOTAL FOR PRO RATA PAYMENTS (TOTAL 85%)</b>   | <b>85</b>  | <b>85</b>                                  |
|  |  |            |  |



# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter-VII: Terms of Payment

| <b>II</b> | <b>STAGE/MILESTONE PAYMENTS (15%)</b>                                   |            |            |
|-----------|---|------------|------------|
| 2.1       | AIR & GAS TIGHTNESS TEST  | 1          | --         |
| 2.2       | GAS DISTRIBUTION TEST   | 1          | --         |
| 2.3       | CHARGING OF ESP FIELDS  | 5          | --         |
| 2.18      | Trial Operation of Unit   | 2          | 2          |
| 2.21      | Painting  | 2          | --         |
| 2.22      | Area cleaning, temporary structures cutting/removal and return of scrap | 1          | 9          |
| 2.23      | Punch List points/pending points liquidation                            | 1          | 1          |
| 2.25      | Material Reconciliation   | 1          | 2          |
| 2.26      | Completion of Contractual Obligation                                    | 1          | 1          |
|           | <b>TOTAL FOR STAGE/MILESTONE PAYMENTS (15%)</b>                         | <b>15</b>  | <b>15</b>  |
|           | <b>TOTAL I + II</b>   | <b>100</b> | <b>100</b> |

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter-VIII: Taxes and Other Duties

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### TAXES, DUTIES, LEVIES

#### 8.1 TAXES, DUTIES, LEVIES

##### 8.1.1

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

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

##### 8.1.2 Service Tax & Cess on Service Tax

Service Tax and Cess on Service Tax as applicable on Services are excluded from contractor's scope; therefore contractor's price/rates shall be **exclusive** of Service Tax and Cess on Services. In case, it becomes mandatory for the contractor under provisions of relevant act/law to collect the Service Tax & Cess from BHEL and pay the same to the concerned tax authorities, such applicable amount will be paid by BHEL at the prevailing Service Tax Rate (presently 10.3 %) on the admitted bill value.

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

- I. The name, address and the registration number of the contractor,
- II. The name and address of the party receiving taxable service,
- III. Description, classification and value of taxable service provided and,
- IV. The service tax payable thereon.

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

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

##### 8.1.3 VAT (Sales Tax /WCT)

As regards Value Added Tax (VAT) on transfer of property in goods involved in Works Contract (previously known as Works Contract Tax) applicable as per local laws, the price quoted by the contractor shall be **exclusive** of the same. Where such taxes are required to be paid by the contractor, this will be reimbursed on production of proof of payment made to the authorities by the Contractor. In any case the Contractor shall

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter-VIII: Taxes and Other Duties

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register himself with the respective Sales Tax authorities of the state and submit proof of such registration to BHEL along with the first RA bill. The contractor has to take all necessary steps to **minimize tax on input goods** by purchasing the materials from any registered dealer of the concerned state only. In case contractor opts for composition, it will be with the prior express consent of BHEL. Deduction of tax at source shall be made as per the provisions of law unless otherwise found exempted. In case tax is deducted at source as per the provisions of law, this is to be construed as an advance tax paid by the contractor and no reimbursement thereof will be made unless specifically agreed to.

### 8.1.4 Modalities of Tax Incidence on BHEL

Wherever the relevant tax laws permit more than one option or methodology for discharging the liability of tax/levy/duty, BHEL will have the right to adopt the appropriate one considering the amount of tax liability on BHEL/Client as well as procedural simplicity with regard to assessment of the liability. The option chosen by BHEL shall be binding on the Contractor for discharging the obligation of BHEL in respect of the tax liability to the Contractor.

### 8.1.5 New Taxes/Levies

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

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

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

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

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

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter-VIII: Taxes and Other Duties

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- i. It shall be the sole responsibility of the contractor in the capacity of employer to forthwith (within a period of 15 days from the award of work) apply for a licence to the Competent Authority under the BOCW Act and obtain proper certificate thereof by specifying the scope of its work. It shall also be responsibility of the contractor to furnish a copy of such certificate of licence / permission to BHEL within a period of one month from the date of award of contract.
- ii. It shall be the sole responsibility of the contractor as employer to ensure compliance of all the statutory obligations under these act and rules including that of payment / deposit of 1% cess on the extant of work involving building or construction workers engaged by the contractor within a period of one month from the receipt of payment.
- iii. It shall be the responsibility of the sub-contractor to furnish the receipts / challans towards deposit of the cess together with the number, name and other details of beneficiaries (building workers) engaged by the sub-contractor during the preceding month.
- iv. It shall be the absolute responsibility of the sub-contractor to make payment of all statutory payments & compensations to its workers including that is provided under the Workmen's Compensation Act, 1923.

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter-IX: SPECIFIC INCLUSIONS

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### **SPECIFIC INCLUSIONS**

1. Sub-delivery items and electrical components such as push-buttons, junction boxes etc.
2. E&C work of cable trays, cables and earthing etc
3. Control panels, EPMS, MCC etc.
4. All electrical and control & instrumentation related to items except those specified elsewhere in these specifications.
5. Testing and commissioning of heating elements, thermostats, HV rectifier transformers.
6. Pneumatic copper tubing and fittings thereof.
7. Electrical and C&I items of Variable Frequency Drives as provided elsewhere in these specifications.

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter-X : SPECIFIC EXCLUSIONS

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### 10.0 EXCLUSIONS

The following works are specific exclusions from the scope of work under erection, testing & commissioning of tender specification-

- i) Civil works except to the extent specifically indicated elsewhere in this tender.
- ii) Supply of primer and paints for final painting

**TECHNICAL CONDITIONS OF CONTRACT (TCC)**  
**Annexure-I ESTIMATED WEIGHT FOR VARIOUS SYSTEMS IN**  
**SCOPE OF WORK**

**APPENDIX -1**  
**LIST OF APPLICABLE PGMA'S FOR UNIT 1 AND 2**

| <b>RANIPET SUPPLY FOR EACH UNIT</b>                                  |             |                               |                               |
|--|-------------|-------------------------------|-------------------------------|
| <b>SL NO.</b>  | <b>PGMA</b> | <b>DESCRIPTION</b>            | <b>DESIGN WEIGHT PER UNIT</b> |
| <b>ESP (Rate Schedule Identifier 1.1 of Rate Schedule SECTION B)</b> |             |                               |                               |
| 1  | 79180       | FOUNDATION MATLS FOR ESP      | 30000                         |
| 2  | 79181       | SUPPORTING STRUCTURES FOR ESP | 990000                        |
| 3  | 79101       | ROLL/SLIDE SUPPORTS           | 35000                         |
| 4  | 79148       | CASING STRUCTURE              | 580000                        |
| 5  | 79143       | HOPPER RIDGES                 | 88000                         |
| 6  | 79149       | CASING SHELL/PANEL            | 850000                        |
| 7  | 89610       | EP GALLERIES & STAIRS         | 174250                        |
| 8  | 79128       | ESP ROOF PANELS               | 235000                        |
| 9  | 79119       | COL ELEC SUSPENSION           | 158500                        |
| 10   | 79113       | EMIT SYST SUSPENSION          | 26500                         |
| 11   | 79146       | INSULATOR SUPP PANEL          | 147000                        |
| 12   | 79121       | EMIT SYS FRAME - TOP          | 153000                        |
| 13   | 79132       | EMIT SYS FRAME - MIDDLE       | 272000                        |
| 14   | 79122       | EMIT SYS FRAME - BOTTOM       | 199000                        |
| 15   | 79114       | SUPPORT INSULATORS            | 11520                         |
| 16   | 79120       | COLLECTING ELECTRODE          | 805000                        |
| 17   | 79220       | COLLECTING ELECTRODE          | 805000                        |
| 18   | 79108       | GAS DIST. ASSY                | 102000                        |
| 19   | 79147       | ROOF PANEL ASSY               | 203000                        |
| 20   | 79150       | INLET-OUTLET FUNNEL           | 240000                        |
| 21   | 79157       | SPLITTER & GUIDE VANES        | 40000                         |
| 22   | 79124       | SHOCK BARS                    | 118400                        |
| 23   | 79125       | COLL ELECT RAPP MECH          | 110000                        |
| 24   | 79111       | GAS SCREEN-EP                 | 45000                         |
| 25   | 79115       | EMITTING ELECTRODES           | 35850                         |
| 26   | 79142       | OUTER ROOF-EP                 | 290000                        |
| 27   | 79144       | HOPPER UPPER PART             | 380000                        |
| 28   | 79145       | HOP MLD & LOWER PART          | 620000                        |
| 29   | 79165       | APP PLATFORM-HOPPER           | 165000                        |
| 30   | 79116       | EMIT ELECT RAPP MECH          | 45600                         |
| 31   | 79117       | DRIVE ARG. FOR EMIT. SYS      | 55850                         |

BHEL-PSWR

Tender Specification No: BHE/PW/PUR/NGRIT-ESP/841

**TECHNICAL CONDITIONS OF CONTRACT (TCC)**  
**Annexure-I ESTIMATED WEIGHT FOR VARIOUS SYSTEMS IN**  
**SCOPE OF WORK**

| SL NO.  | PGMA  | DESCRIPTION                      | DESIGN WEIGHT PER UNIT |
|---|-------|----------------------------------|------------------------|
| 32  | 79106 | INSULATOR HOUSING AS             | 77000                  |
| 33  | 79155 | PENT HOUSE FOR EP                | 285000                 |
| 34  | 89611 | ESP ROOF HANDRAILS               | 12650                  |
| 35  | 79126 | COLL ELECT RAPP DRIVE            | 11200                  |
| 36  | 79109 | GD RAPPING MECHANISM             | 15800                  |
| 37  | 79110 | GD_DRIVE ARRANGEMENT             | 1380                   |
| 38  | 79123 | INSPECTION DOORS                 | 20000                  |
| 39  | 79159 | CONTROL ROOM-INSERTS             | 10000                  |
| 40  | 79131 | GEARED MOTORS FOR RAPPING MECH   | 40000                  |
| 41  | 79105 | ESP-SUB-DELIEVERY COMPONENTS     | 800                    |
| 42  | 79190 | HEATING ELEMENTS                 | 4000                   |
| 43  | 79130 | ELECTRICAL SD COMPTS             | 24000                  |
| 44  | 79137 | JUNCTION BOX & PUSH BUTTON STA   | 3000                   |
| 45  | 79160 | CABLE-CABLE RACKS                | 186250                 |
| 46  | 79162 | EARTHING, CABLE TRAYS, SUP CHA   | 195000                 |
| 47  | 79166 | WATER WASHING SYSTEM             | 8600                   |
| 48  | 79172 | INTERLOCKS-EP                    | 2700                   |
| 49  | 79192 | AUXILIARY CONTROL PANEL          | 40000                  |
| 50  | 79177 | LT SWITCH BOARD/ESP SWITCH GEAR  | 40000                  |
| 51  | 79178 | BAPCON & ACCESSORIES             | 1500                   |
| 52  | 79193 | RAPPER CONTROL PANEL             | 1800                   |
| 53  | 79173 | ELECTRICALLY OPERTD HOIST & ACCE | 12500                  |
| 54  | 79194 | STATCON PANEL                    | 1800                   |
| 55  | 79174 | OPACITY MONITOR & ACCESSORIES    | 1500                   |
| 56  | 79163 | ASH LEVEL INDICATOR              | 1050                   |
| 57  | 79161 | EP PERF TEST EQUIPT              | 2000                   |
|   |       |                                  | 9010000                |
| <b>Insulation - Mineral Wools(Rate Schedule Identifier 2.1 of Rate Schedule SECTION B)</b>      |       |                                  |                        |
| 58  | 79167 | MIN WOOL FOR ESP INSULATION      | 380000                 |
| <b>Insulation - Fixing Components (Rate Schedule Identifier 2.2 of Rate Schedule SECTION B)</b> |       |                                  |                        |
| 59  | 79168 | FIXING COMP. FOR ESP INSULATIN   | 208000                 |
| <b>Total for Ranipet Supply for Each Unit</b>   |       |                                  | <b>9598000</b>         |



**TECHNICAL CONDITIONS OF CONTRACT (TCC)**  
**Annexure-I ESTIMATED WEIGHT FOR VARIOUS SYSTEMS IN**  
**SCOPE OF WORK**

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|  |               |
|--|---------------|
| <b>JHANSI SUPPLY</b>                       |               |
| <b>HVR (Total 192 No.s for both Units)</b> | <b>391680</b> |

**\* Rate Schedule Identified for PGMA's of Insulation are Indicative only and based on envisaged material specification. Payment shall be made on the basis of material specification of actual material received and erected at site.**

**NOTES:**

1. Besides product groups indicated herein, there is likelihood of addition of new product groups by BHEL' s unit for release of some items, integral to this work. Tenderers' quoted unit rates shall be applicable for such product groups also.
2. The weights given against PGMA's listed above are tentative. It may change after detailed engineering is done. Rate quoted by the Contractor shall not change due to variation in weight.
3. Rate Schedule Identified for PGMA's of Insulation are Indicative only and based on envisaged material specification. Payment shall be made on the basis of material specification of actual material received and erected at site.
4. BHEL's decision with regard to classification of a particular product group for applicable rate category shall be final & binding on the Contractor.
5. Besides the above, weight of all temporary piping, valves, pumps, tanks and other miscellaneous equipments etc as stated elsewhere will get added.

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Annexure-II PAINTING SCHEME

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(Will be issued during Execution)

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter-I A

### MATERIAL HANDLING AND MATERIAL MANAGEMENT SERVICES

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#### 11.0 General - Material Handling and Material Management Services

##### 11.1

THE INTENT OF SPECIFICATION IS TO PROVIDE MATERIAL HANDLING AND MATERIALS MANAGEMENT SERVICES ACCORDING TO THE MOST MODERN AND PROVEN TECHNIQUES AND CODES. THE OMISSION OF SPECIFIC REFERENCE TO ANY METHOD, EQUIPMENT OR MATERIALS NECESSARY FOR PROPER AND EFFICIENT UNLOADING, TRANSPORTATION, VERIFICATION, STACKING & PRESERVATION ETC SHALL NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY OF PROVIDING SUCH FACILITIES TO COMPLETE THE WORK WITHOUT ANY EXTRA COMPENSATION.

##### 11.2

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

##### 11.3

ALL THE WORK SHALL BE CARRIED OUT AS PER THE INSTRUCTIONS OF BHEL ENGINEER. BHEL ENGINEER'S DECISION REGARDING CORRECTNESS OF THE WORK AND METHOD OF WORKING SHALL BE FINAL AND BINDING ON THE CONTRACTOR.

##### 11.4

THE CONTRACTOR SHALL PERFORM ALL REQUIRED SERVICES WHICH MAY NOT BE SPECIFIED HEREIN BUT NEVERTHELESS REQUIRED FOR THE COMPLETION OF WORK WITHIN ACCEPTED RATES.

##### 11.5

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

##### 11.6

ALL CRANES, TRANSPORT EQUIPMENTS, HANDLING EQUIPMENT, TOOLS, TACKLES, FIXTURES, EQUIPMENT, MANPOWER, SUPERVISORS/ENGINEERS, CONSUMABLES ETC REQUIRED FOR THIS SCOPE OF WORK SHALL BE PROVIDED BY THE CONTRACTOR.

##### 11.7

ALL EXPENDITURE INCLUDING TAXES AND INCIDENTALS IN THIS CONNECTION WILL HAVE TO BE BORNE BY THE CONTRACTOR UNLESS OTHERWISE SPECIFIED IN THE RELEVANT CLAUSES ELSEWHERE IN THESE SPECIFICATIONS. THE ACCEPTED RATES SHALL INCLUDE ALL SUCH CONTINGENCIES. IN THIS CONNECTION REFER RELEVANT CLAUSE OF GENERAL CONDITIONS OF CONTRACT.

##### 11.8

THE CONTRACTOR SHALL PERFORM ALL REQUIRED SERVICES WHICH MAY NOT BE SPECIFIED HEREIN BUT NEVERTHELESS REQUIRED FOR THE COMPLETION OF WORK WITHIN ACCEPTED RATES.

##### 11.9

THE DISTANCES INDICATED IN THESE SPECIFICATIONS ARE ONLY APPROXIMATE. HOWEVER, THE TENDERERS SHOULD ASSESS THE VARIOUS DISTANCES AND SITE CONDITIONS BY VISITING SITE BEFORE SUBMITTING THEIR OFFER. NO ADDITIONAL/EXTRA CLAIMS FOR ANY VARIATION IN THIS REGARD WILL BE ENTERTAINED.

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter-I A

### MATERIAL HANDLING AND MATERIAL MANAGEMENT SERVICES

---

#### 11.10

CONTRACTOR SHALL ARRANGE FOR CUTTING AND REMOVAL OF VEGETATION GROWTH/GRASS ETC IN THE STORAGE YARD AS AND WHEN CALLED FOR BY BHEL AS INCIDENTAL TO WORK. BHEL WILL TAKE APPROPRIATE ACTION AT THE RISK & COST OF THE CONTRACTOR IN CASE OF FAILURE IN THIS REGARD.

#### 11.11

IF THE CONTRACTOR OR HIS WORKMEN OR EMPLOYEES BREAK, DEFACE, INJURE OR DESTROY ANY PART OF A BUILDING, ROAD, KERBS, FENCE, ENCLOSURES, WATER PIPES, CABLES, DRAINS, ELECTRIC OR TELEPHONE POSTS OR WIRES, TREES OR ANY OTHER PROPERTY OR TO ANY PART OF ERECTED EQUIPMENTS, STORED COMPONENTS ETC. WITHIN THE PROJECT PREMISES OR OUTSIDE THE CONTRACTOR SHALL MAKE THE SAME GOOD AT HIS OWN EXPENSES.

### **12.0 MATERIAL HANDLING AND MATERIAL MANAGEMENT OF MATERIALS RECEIVED BY ROAD**

#### 12.1

MAJORITY OF CONSIGNMENTS SHALL REACH SITE DIRECTLY FOR DELIVERY. HOWEVER A GOOD NUMBER OF CONSIGNMENTS SHALL BE BOOKED ON GODOWN DELIVERY BASIS OR DOOR DELIVERY AGAINST CONSIGNEE COPY BASIS, THE PROCEDURE OF MATERIAL COLLECTION SHALL BE ADOPTED AS DETAILED IN RELAVENT CHAPTER

#### 12.2

IT WILL BE RESPONSIBILITY OF THE CONTRACTOR TO KEEP IN TOUCH WITH OFFICIALS OF BHEL REGARDING ADVANCE INFORMATION ABOUT ARRIVAL OF CONSIGNMENTS. THE CONTRACTOR SHALL COLLECT LORRY WAY BILLS OR OTHER SUCH DESPATCH DOCUMENTS.

#### 12.3

THE CONTRACTOR SHALL REMAIN IN REGULAR CONTACT WITH THE CONCERNED TRANSPORTERS OR BASED ON THE DESPATCH DETAILS OBTAINED AS STATED ABOVE AND MAKE ALL NECESSARY ARRANGEMENTS FOR COLLECTION / RECEIPT OF THE CONSIGNMENT AS APPLICABLE. CONTRACTOR SHALL TAKE ADVANCE ACTION TO DEPLOY ALL NECESSARY RESOURCES FOR LOCAL TRANSPORTATION, HANDLING AND UNLOADING OF THE ANTICIPATED CONSIGNMENTS SO AS TO ENSURE NO LOSS OF TIME UPON ARRIVAL OF THE CONSIGNMENTS.

#### 12.4

DETENTION CHARGES/DEMURRAGE/WHARFAGE ETC., WHICH RESULT DUE TO CONTRACTOR'S FAULT, SHALL BE RECOVERED FROM THE BILL PAYMENT DUE TO THE CONTRACTOR.

#### 12.5

IT WOULD BE RESPONSIBILITY OF THE CONTRACTOR TO EXAMINE THE PACKAGES, CONSIGNMENTS ETC. IMMEDIATELY ON ARRIVAL AND BRING TO THE NOTICE OF BHEL AUTHORITIES REGARDING LOSS/DAMAGE/SHORTAGE/DISCREPANCY, IF ANY, OBSERVED IN THE CONSIGNMENTS BEFORE TAKING DELIVERY OF THE SAME.

#### 12.6

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter-I A

### MATERIAL HANDLING AND MATERIAL MANAGEMENT SERVICES

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ANY DISCREPANCY/SHORTAGE/DAMAGE FOUND IN THE CONSIGNMENT AFTER TAKING CLEAN DELIVERY FROM THE CARRIERS SHALL BE THE RESPONSIBILITY OF CONTRACTOR AND THE RESULTANT LOSS TO BHEL ON SUCH ACCOUNT SHALL BE RECOVERABLE FROM THE CONTRACTOR.

#### 12.7

CONSIGNMENTS ARE EXPECTED TO ARRIVE DURING ANY TIME OF THE DAY, AND COUNT DOWN FOR DETENTION/DEMURAGE/WHARFAGE CHARGES IS LIABLE TO START IMMEDIATELY. UNLOADING OF SUCH CONSIGNMENTS MAY BE NECESSITATED EVEN IN THE NIGHT OR ROUND THE CLOCK. CONTRACTOR SHALL ARRANGE TO DEPLOY HIS RESOURCES IMMEDIATELY AND CONTINUE ROUND THE CLOCK ON SUCH OCCASIONS WITHOUT ANY ADDITIONAL COST TO BHEL. CONTRACTOR SHALL ARRANGE ALL NECESSARY RESOURCES INCLUDING SPOT LIGHTING FOR WORKING AT NIGHT. THE CONTRACTOR SHALL SIMILARLY UNLOAD CONSIGNMENTS ARRIVING ON WEEKLY OFF DAYS AND HOLIDAYS.

#### 12.8

UNLOADING AT STORAGE AREA/WORK SITE, STACKING AND RESTACKING IF NECESSITY ARISES, OF ALL MATERIALS INCLUDING HEAVY/SOPHISTICATED EQUIPMENTS LIKE TUBED WALL PANELS OF BOILER, HEAVY MOTORS, HEAVY BEARING PEDESTALS, ELECTRICAL PANELS AND TG EQUIPMENT LIKE HEAVY TURBINE COMPONENTS, PUMPS, PANELS, ETC. SHALL BE DONE AS PER STORAGE AND PRESERVATION MANUAL OF RELEVANT EQUIPMENT/COMPONENTS OF BHEL AND/OR AS PER DIRECTIONS OF BHEL ENGINEER.

#### 12.9

THE CONTRACTOR SHALL VERIFY THE CONSIGNMENTS IN DETAIL **WITHIN 12 DAYS OF RECEIPT AND REPORT THE DISCREPANCIES IN PRESCRIBED FORMATS NOT LATER THAN 14<sup>TH</sup> DAY.** ANY LOSS ON ACCOUNT OF DELAYED REPORTING SHALL BE RECOVERABLE FROM CONTRACTORS BILL/ANY PAYMENT DUE. CONTRACTOR SHALL ARRANGE ALL FACILITIES TO OPEN PACKAGES - WHERE REQUIRED IN THE PRESENCE OF BHEL ENGINEER, VERIFY THE CONTENTS, REPACK WHEREVER AND WHENEVER CALLED FOR AND PROPERLY STACK THEM AS PER STORAGE MANUAL OR/AND AS MAY BE DIRECTED BY BHEL.

#### 12.10

THE MATERIAL SHALL BE SO STACKED THAT IT SHOULD FACILITATE EASY IDENTIFICATION, RETRIEVAL AND HANDLING FOR ISSUE AS AND WHEN NEED ARISES.

#### 12.11

PRE-DEFINED IDENTIFICATION SYSTEM OF THE LOCATIONS OF OPEN STORAGE YARD, ~~SEMI-CLOSED SHED~~, COVERED STORES AS WELL AS STORAGE RACKS HAS TO BE DESIGNED BY THE CONTRACTOR WITH THE APPROVAL OF BHEL. CONTRACTOR SHALL PUT UP PROMINENT IDENTIFICATION BOARDS OF SEGMENTAL LOCATIONS (FOR OPEN ~~AND SEMI-CLOSED~~ STORES) OR INSCRIPTION (ON THE STORAGE RACKS) WITH CLEAR VISIBILITY FROM A DISTANCE. CONTRACTOR SHALL ALSO ARRANGE TO DISPLAY PLOT PLAN AT REGULAR INTERVALS IN THE COVERED/SEMI-CLOSED/OPEN STORAGE. THE CONTRACTOR SHALL ARRANGE PROPER DISPLAYS/SIGNS FOR VARIOUS REQUIREMENTS AS PER INSTRUCTIONS OF BHEL.

#### 12.12

THE CONTRACTOR SHALL EXECUTE THE WORK IN A PROFESSIONAL MANNER. THE STORES SHALL BE HANDLED WITH DUE CARE AND DILIGENCE. THE CONTRACTOR AT HIS RISK AND COST SHALL MAKE GOOD ANY LOSS TO BHEL DUE TO CONTRACTOR'S LAPSE.

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter-I A

### MATERIAL HANDLING AND MATERIAL MANAGEMENT SERVICES

---

12.13

FOR ALL CONSIGNMENTS, OBSERVATIONS REGARDING LOSS/DAMAGE/SHORTAGE/ DISCREPANCY IS TO BE RECORDED IN APPROPRIATE DOCUMENT AND INFORMED TO BHEL. IN CASE IT BECOMES NECESSARY TO TAKE '**OPEN DELIVERY**' FROM THE AUTHORITIES, CONTRACTOR SHALL MAKE ALL ARRANGEMENTS FOR TAKING OPEN DELIVERIES. ALL EXPENSES CONNECTED THEREWITH SHALL BE TO THE ACCOUNT OF CONTRACTOR. ANY LOSS THAT ACCRUES TO BHEL ON ACCOUNT OF SUCH FAILURES SHALL BE DEBITED TO THE CONTRACTOR AND RECOVERY EFFECTED FROM HIS RUNNING BILLS.

12.14

THE CONTRACTOR UNDER THIS CONTRACT SHALL COMPLETE INDUCTION OF FOLLOWING CATEGORIES OF RESOURCES WITHIN THE ACCEPTED ITEM RATES, TO ENSURE ESTABLISHMENT OF PROPER **MATERIALS MANAGEMENT** AT THE PROJECT SITE.

1. COMPUTERS WITH LATEST UP-GRADATION, MEMORY AND COMPATIBLE WITH BHEL COMPUTERS/LAN EQUIPMENT TO BE INSTALLED/USED WITHIN BHEL SITE OFFICE- 02 SETS
2. ITEM RATE IN THE RATE SCHEDULE (SECTION A) HAS SPECIFIC MENTION OF "MATERIALS MANAGEMENT" WITH SOLE PURPOSE TO EMPHASIZE THE REQUIREMENT OF SUFFICIENT NO. OF ADEQUATELY QUALIFIED MANPOWER TO ENSURE BEST OBTAINABLE QUALITY OF WORK. ACCORDINGLY, SUPERVISORS/MANPOWER (APART FROM WORKMEN ON CRANES AND MATERIAL HANDLING PURPOSE) AS INDICATED AGAINST EACH ACTIVITY IN THE TABLE BELOW, NORMALLY TO WORK AT (BUT NOT LIMITED TO) BHEL SITE OFFICE

#### **RESPONSIBILITIES OF THE CONTRACTOR -**

##### **(1) RECEIPT & ISSUE**

SCOPE INCLUDES EXECUTION OF VARIOUS ACTIVITIES AS FOLLOWS:

- (I) RECEIPT, UNLOADING, CARRYING OUT RECEIPT INSPECTION, DETAILED VERIFICATION, STACKING AND REGULAR STOCK VERIFICATION OF PROJECT MATERIALS AT SITE.
- (II) PREPARING VARIOUS REPORTS AT APPROPRIATE STAGES AND REPORTING DAMAGE/LOSS DURING RECEIPT AS WELL AS STORAGE AND ANY OTHER ASSOCIATED RESPONSIBILITY AS ASSIGNED BY BHEL FROM TIME TO TIME. RESPONSIBILITY SHALL INCLUDE THE FOLLOWING ACTIVITIES:
  - a. EXAMINATION OF INCOMING CONSIGNMENTS TO DETECT ANY LOSS OR SHORTAGE OR OUTWARD DAMAGE AND RECORDING IT ON THE LR/LWB BEFORE MAKING ACKNOWLEDGEMENT OF IT'S RECEIPT FROM THE TRANSPORTER AND SIMULTANEOUSLY OBTAINING ENDORSEMENT OF THE VEHICLE DRIVER ON THE SAME.
  - b. REPORTING SUCH DISCREPANCY TO BHEL IMMEDIATELY ON RECEIPT OF CONSIGNMENT.

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter-I A

### MATERIAL HANDLING AND MATERIAL MANAGEMENT SERVICES

---

c. ASSISTING BHEL IN LODGING INSURANCE CLAIMS IN RESPECT OF LOSS/DAMAGE AS STATED ABOVE.

- (III) ISSUE OF MATERIALS TO BHEL'S ERECTION CONTRACTORS, PRESERVATION OF STACKED MATERIALS, RE-STACKING/RE-HANDLING AS NECESSARY, PROGRESSIVE AND FINAL RECONCILIATION WITH BHEL'S ERECTION AGENCIES AND PREPARATION OF NECESSARY DOCUMENT/ RECORD IN RESPECT OF THESE ACTIVITIES.
- (IV) RETURN OF EXCESS/DEFECTIVE MATERIALS BY VARIOUS ERECTION CONTRACTORS OF BHEL.
- (V) LOADING AND DISPATCH OF OUTGOING MATERIALS.

#### EXPECTED MINIMUM QUALITY OF SERVICE

CONTRACTOR SHALL RENDER THE SERVICES BY ENSURING DEPLOYMENT OF REQUISITE PERSONNEL WITH ADEQUATE EDUCATIONAL QUALIFICATION OF ENGINEERING/TECHNICAL BACKGROUND, HAVING THOROUGH EXPERIENCE IN RELATED FIELD TO ENABLE UNDERSTANDING THE INTRICACIES OF AND SPECIAL REQUIREMENTS INVOLVED IN HANDLING OF PROJECT MATERIALS, INCONSISTENCIES AND UNCERTAINTIES ASSOCIATED WITH IN/OUT FLOW OF MATERIALS, PROJECT ACTIVITIES AT ODD HOURS & HOLIDAYS AND IRREGULAR WORKING HOURS. CONTRACTOR SHALL ENSURE PROMPT AND TIMELY AVAILABILITY OF SUCH SERVICES.

#### **(2) PRESERVATION OF COMPONENTS -**

CONTRACTOR SHALL ARRANGE FOR PRESERVATION OF COMPONENTS AS PER BHEL'S STORAGE AND PRESERVATION MANUAL AND/OR AS PER INSTRUCTIONS OF BHEL ENGINEERS.

ONE OR MORE OF FOLLOWING METHODS SHALL BE ADOPTED FOR PRESERVATION.

- 1) COATING WITH PRESERVATIVE PAINTS/LUBRICANT/INHIBITORS
- 2) CAPPING/WRAPPING/COVERING
- 3) FILLING/IMMERSION IN OIL/CHEMICALS ETC
- 4) PERIODIC CHECKS/MAINTAINING REQUIRED NITROGEN PRESSURE IN TANKS OF TRANSFORMERS; BHEL WILL PROVIDE THE NITROGEN GAS FOR THE SAME. HOWEVER CONTRACTOR SHALL HANDLE THE CYLINDERS AT STORES, TRANSPORT TO POINT OF USE, FIT-UP REFILLS AND RETURN EMPTY CYLINDERS TO BHEL STORES.
- 5) HT MOTORS

FOR PRESERVATION OF HT MOTORS, SPACE HEATERS HAVE TO BE KEPT ENERGIZED TO AVOID INGRESS OF MOISTURE. INSULATION RESISTANCE HAS TO BE MEASURED AND RECORDED AT SPECIFIED INTERVALS TILL THESE ARE ISSUED FOR ERECTION. BHEL WILL PROVIDE NECESSARY CABLES, SWITCHES ETC. FOR THIS, HOWEVER CONTRACTOR SHALL INSTALL, OPERATE AND MAINTAIN THE SAME.

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter-I A

### MATERIAL HANDLING AND MATERIAL MANAGEMENT SERVICES

---

BHEL WILL PROVIDE FREE OF COST ALL PRESERVATIVES LIKE PRESERVATIVE OIL, LUBRICANTS, CHEMICALS, INHIBITORS, CAPS ETC EXCEPT PRIMERS & PAINTS. CONTRACTOR SHALL PROVIDE RED OXIDE ZINC CHROMATE (ROZC) PRIMER CONFORMING TO IS:2074 OF REPUTED MANUFACTURES (E.G. ASIAN PAINTS, BERGER, JENSON & NICHOLSON, BOMBAY PAINTS, SHALIMAR OR ANY OTHER BHEL APPROVED MANUFACTURER) REQUIRED FOR PRESERVATION SHALL BE PROVIDED BY THE CONTRACTOR AND USED FOR THIS PURPOSE.

IN THE PROCESS THE IDENTIFICATION MARKS, COMPONENT/MATERIAL CODES, MATCH MARKS MAY HAVE TO BE REPAINTED. THIS WORK AFTER PRESERVATION COMPONENTS ARE TO BE STACKED PROPERLY, PERIODICAL REPORTS ON THE PRESERVATION CARRIED OUT SHOULD BE SUBMITTED TO BHEL IN THE PRESCRIBED FORMATS.

#### **(3) RECORD KEEPING –**

CONTRACTOR SHALL PREPARE, MAINTAIN AND UPDATE VARIOUS MM RECORDS, ASSOCIATED WITH MATERIALS MANAGEMENT OPERATION OF BHEL AT PROJECT SITE. TWO SYSTEMS OF RECORD KEEPING/CAPTURING INFORMATION & DATA AT VARIOUS STAGES ARE IN VOGUE VIZ.

- i. MANUAL LEDGERS & RECORDS.
- ii. COMPUTERIZED DATABASE APPLICATION: BHEL HAS DEVELOPED A SOFTWARE APPLICATION NAMED SITE OPERATIONS MANAGEMENT SYSTEM (SOMS) THAT CAPTURES ALL THE DATA IN THE ENTIRE CHAIN OF TRANSACTIONS STARTING WITH MASTER LIST OF PROJECT MATERIALS, RECORDS OF DISPATCH, RECEIPT, INSPECTION, ISSUE, RETURN, CONSUMPTION ETC.

SOME OF THESE RECORDS ARE MASTER SHIPPING/PACKING LIST, LR/RR REGISTER, DAYBOOK REGISTER, STOCK REGISTER, RECORDS OF ISSUES TO & RETURN OF MATERIALS IN RESPECT OF VARIOUS ERECTION SUBCONTRACTORS, INSURANCE CLAIM RECORDS, PERIODICAL STATUS REPORTS IN VARIOUS FORMATS COVERING DESIRED ASPECTS AND OUTPUT INFORMATION AS PER BHEL/CLIENT'S REQUIREMENT.

CONTRACTOR WILL PROVIDE NECESSARY HARDWARE, SOFTWARE & STATIONARY ETC. AND SHALL TAKE UTMOST CARE TO ENSURE THAT THESE PROPERTIES AND RECORDS ARE PROTECTED FROM ANY DAMAGE OR LOSS. BHEL WILL RECOVER THE COST OF SUCH PROPERTY / EXPENSES OF RESTORATION FROM THE CONTRACTOR WITH 30% OVERHEAD CHARGES IN CASE OF ANY LOSS/DAMAGE ATTRIBUTABLE TO NEGLIGENCE/FAILURE ON CONTRACTOR'S PART.

| SL NO | ACTIVITY/DESCRIPTION                             | MINIMUM NO. OF PERSONS | REMARKS   |
|-------|--|------------------------|---|
| 1     | MATERIAL RECEIPT/UNLOADING, COLLECTION/ BOOKINGS | 2                      | TO BE DEPLOYED FROM BEGINNING                                       |
| 2     | DETAILED VERIFICATION                            | 1                      | TO BE DEPLOYED FROM BEGINNING                                       |
| 3     | MATERIAL ISSUE                                   | 1+1                    | 1 <sup>ST</sup> No. FROM BEGINNING AND 2 <sup>ND</sup> FROM 6 MONTH |
| 4     | PRESERVATION                                     | 1 + 3                  | GANG OF 3 LABOURS LEAD BY 1 QUALIFIED PERSON FROM 3 <sup>rd</sup>   |

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# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter-I A

### MATERIAL HANDLING AND MATERIAL MANAGEMENT SERVICES

| SL NO | ACTIVITY/DESCRIPTION  | MINIMUM NO. OF PERSONS | REMARKS  |
|-------|---|------------------------|--|
|       |   |                        | MONTH ONWARDS  |
| 5     | RECORD KEEPING  | 1+1                    | 1 FROM BEGINNING and 2 <sup>nd</sup> FROM 4 <sup>th</sup> MONTH ONWARD |
| 6     | RECORD KEEPING (T&P STOCK, MRC, ASSISTANCE IN INSURANCE CLAIMS, PURCHASE ETC) | 1                      | FROM 2 <sup>nd</sup> MONTH ONWARDS                                     |

**NOTE:** THE NO. OF PERSONS INDICATED ABOVE IS TENTATIVE AND ACTUAL DEPLOYMENT MAY VARY BASED ON WORK LOAD AND SITE REQUIREMENT, NOR THE DEPLOYMENT ABSOLVES THE CONTRACTOR FROM HIS RESPONSIBILITY TOWARDS THE SATISFACTORY EXECUTION OF THE JOB

**IN CASE THE CONTRACTOR DOES NOT DEPLOY OR DELAYS DEPLOYMENT OF ABOVE SAID MANPOWER WITH REFERENCE TO SPECIFIC INSTRUCTIONS FROM BHEL, BHEL WILL RECOVER NON-REFUNDABLE PENALTY PER MAN- DAY @ Rs 500**

#### 12.15

PAYMENT FOR ALL MATERIALS INCLUDING OD AND HEAVIER COMPONENTS RECEIVED BY ROAD SHALL BE REGULATED ON THE ACCEPTED UNIT **RATE AS PER SL NO A OF RATE SCHEDULE SECTION A.**

### 13.0 MATERIAL HANDLING AND MATERIAL MANAGEMENT OF MATERIAL RECEIPT BY RAIL

#### 13.1

PRESENTLY THERE IS NO RAILWAY SIDING IN THE PROJECT PREMISES. HOWEVER, IT MAY BE MADE AVAILABLE AT A LATER DATE. ALL THE CONSIGNMENTS REACHING THE PROJECT SITE BY RAIL SHALL BE UNLOADED AT THE RAILWAY SIDING, FOLLOWED BY LOADING ON TRUCK/TRAILER, LOCAL TRANSPORTATION FROM RAILWAY SIDING TO THE STORAGE YARD/STORES, UNLOADING, VERIFICATION AND STACKING AND PRESERVATION AS APPLICABLE TO THE CONSIGNMENTS ARRIVING BY ROAD. THE APPROXIMATE DISTANCE FORM MAIN STORAGE YARD TO RAILWAY SIDING WILL BE 6-7 KM.

#### 13.2

IT WILL BE RESPONSIBILITY OF THE CONTRACTOR TO KEEP IN TOUCH WITH OFFICIALS OF BHEL AND RAILWAYS REGARDING ADVANCE INFORMATION ABOUT ARRIVAL OF CONSIGNMENTS. THE CONTRACTOR SHALL COLLECT RAILWAY RECEIPTS OR OTHER SUCH DESPATCH DOCUMENTS.

#### 13.3

CONTRACTOR SHALL DEPLOY HIS CRANE, TRAILERS/TRUCKS AND ALL OTHER T & P INCLUDING ADDITIONAL T & P AND MANPOWER ETC FOR HANDLING OF MATERIALS AT SUCH UNLOADING BAY/ LOCATION AND TRANSPORT TO STORES/ STORAGE YARD.

#### 13.4

CONTRACTOR SHALL IN HIS OWN INTEREST ARRANGE TO RELEASE THE RAILWAY WAGONS/RACKS WITH UTMOST ALACRITY TO AVOID ANY DEMURRAGE CHARGES. DEMURRAGE/ WHARFAGE ETC.,

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter-I A

### MATERIAL HANDLING AND MATERIAL MANAGEMENT SERVICES

---

WHICH RESULT DUE TO CONTRACTOR'S FAULT, SHALL BE RECOVERED FROM THE BILL PAYMENT DUE TO THE CONTRACTOR.

13.5

CONTRACTOR SHALL PROVIDE AREA LIGHTING AT RAILWAY SIDING FOR HANDLING OF MATERIALS DURING EVENING/ NIGHT.

13.6

ALL THE RESPONSIBILITIES SPECIFIED IN THE CONTRACTOR'S SCOPE FOR THE MATERIALS RECEIVED BY ROAD SHALL ALSO BE APPLICABLE MUTATIS-MUTANDIS FOR ALL THE CONSIGNMENTS RECEIVED BY RAIL AT RAILWAY SIDING.

13.7

FOR THE CONSIGNMENTS RECEIVED BY RAIL THE PAYMENT WILL BE REGULATED ON PRO-RATA BASIS ON THE **ACCEPTED UNIT RATE AS PER SL NO B OF RATE SCHEDULE SECTION A**. THE ABOVE ALSO INCLUDES ALL COSTS TOWARDS UNLOADING FROM THE WAGON AT THE UNLOADING SIDING IN THE PLANT AND LOADING ON THE TRANSPROT AND THE COST TOWARDS INTERNAL TRANSPORTATION TO STORAGE YARD/ STORES SHED OF BHEL/ CLIENT.

#### 14.1 RE-SHIFTING AND RE-STACKING

OWING TO SEVERAL PROJECT REQUIREMENTS, MANY COMPONENTS MAY HAVE TO BE SHIFTED FROM ORIGINALLY STACKED LOCATIONS TO ELSEWHERE WITHIN THE PROJECT PREMISES FOR THE LEAD DISTANCE NOT EXCEEDING 2.5 KMS. THIS MAY INVOLVE LOADING OF SUCH MATERIAL ONTO A VEHICLE MOVING TO A NEW LOCATION AND UNLOADING/STACKING INCLUDING PROPER INSCRIPTION OF IDENTIFICATION MARKS IF NEEDED. LIST OF ITEMS DULY CERTIFIED BY BHEL OFFICIAL, SHIFTED, UPDATED STOCK RECORDS ABOUT CHANGE IN LOCATION ETC SHALL BE PREPARED/SUBMITTED ALONG WITH THE MONTHLY BILLS

SEPARATE ITEM RATE IS ASSIGNED FOR RESHIFTING AND RE-STACKING OF STACKED MATERIALS AND THE PAYMENT WILL BE REGULATED ON PRO-RATA BASIS ON THE ACCEPTED UNIT **RATE AS PER SL NO E OF RATE SCHEDULE SECTION A**

#### 14.2 RE-STACKING/RE-ARRANGING

OVER A PERIOD OF TIME, RESTACKING/REARRANGING OF THE MATERIALS STACKED EARLIER MAY ARISE DUE TO VARIOUS REASONS. THE HANDLING OF SUCH ITEMS WILL ALSO BE IN THE SCOPE OF THIS CONTRACT. THE RESTACKING/ RE-HANDLING MAY BE NECESSITATED FOR ANY EQUIPMENT/ MATERIALS COVERED WITHIN THIS WORK SPECIFICATION. CONTRACTOR SHALL DEPLOY NECESSARY RESOURCES LIKE MANPOWER, T&P, EQUIPMENTS ETC TO CARRY OUT THIS EXERCISE INCLUDING PROPER INSCRIPTION OF IDENTIFICATION MARKS IF NEEDED. LIST OF ITEMS DULY CERTIFIED BY BHEL OFFICIAL, RESTACKED, UPDATED STOCK RECORDS ABOUT CHANGE IN LOCATION ETC SHALL BE PREPARED/SUBMITTED ALONG WITH THE MONTHLY BILLS

RESTACKING AND REARRANGING SHALL BE APPLICABLE FOR MATERIALS RETURNED BY BHEL'S ERECTION CONTRACTORS ALSO.

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

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### MATERIAL HANDLING AND MATERIAL MANAGEMENT SERVICES

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**RATE FOR RESTACKING/REARRANGING SHALL BE DERIVED AS 40% OF UNIT RATE ACCEPTED FOR ITEM NO E OF RATE SCHEDULE SECTION A.**

#### **15.0 MATERIAL HANDLING AND MATERIAL MANAGEMENT OF MATERIAL COLLECTION / DISPATCHES**

##### **15.1 INCOMING MATERIALS (SMALLS ETC)**

###### **15.1.1**

EVEN THOUGH MAJORITY OF CONSIGNMENTS SHALL REACH SITE DIRECTLY FOR DELIVERY. A GOOD NUMBER OF CONSIGNMENTS SHALL BE BOOKED ON GOWDOWNS DELIVERY/ DOOR DELIVERY BASIS AGAINST ORIGINAL CONSIGNEE COPY BASIS, THE PROCEDURE OF MATERIAL COLLECTION SHALL BE ADOPTED AS DETAILED HERE BELOW:

###### **15.1.2**

CONTRACTOR SHALL KEEP IN TOUCH WITH OFFICIALS OF BHEL REGARDING ADVANCE INFORMATION ABOUT ARRIVAL OF CONSIGNMENTS. THE CONTRACTOR SHALL COLLECT ORIGINAL LRs/RRs/LORRY WAY BILLS OR OTHER SUCH DISPATCH DOCUMENTS

###### **15.1.3**

THE CONTRACTOR SHALL REMAIN IN REGULAR CONTACT WITH THE CONCERNED TRANSPORTERS OR RAILWAYS BASED ON THE DISPATCH DOCUMENTS OBTAINED AS STATED ABOVE AND MAKE ALL NECESSARY ARRANGEMENTS FOR COLLECTION / RECEIPT OF THE CONSIGNMENT AS APPLICABLE. CONTRACTOR SHALL TAKE ADVANCE ACTION TO DEPLOY ALL NECESSARY RESOURCES FOR LOCAL TRANSPORTATION, HANDLING AND UNLOADING OF THE ANTICIPATED CONSIGNMENTS SO AS TO ENSURE NO LOSS OF TIME UPON ARRIVAL OF THE CONSIGNMENTS. LOADING AT TRANSPORTERS GODOWN, LOCAL TRANSPORT UP TO BHEL/ CLIENT'S STORES/ SITE AND UNLOADING AT STORES/STORAGE YARD/SITE, VERIFICATION AND STACKING SHALL ALSO BE IN THE SCOPE OF CONTRACT.

###### **15.1.4**

DETENTION CHARGES/ DEMURRAGE/ WHARFAGE ETC., WHICH RESULT DUE TO CONTRACTOR'S FAULT, SHALL BE RECOVERED FROM THE BILL PAYMENT DUE TO THE CONTRACTOR.

###### **15.1.5**

SEPARATE ITEM RATE IS ASSIGNED FOR MATERIAL HANDLING AND MATERIAL MANAGEMENT OF INCOMING MATERIALS (SMALLS/FULL TRUCK LOADS) FROM TRANSPORTERS GODOWNS AND THE PAYMENT WILL BE REGULATED ON PRO-RATA BASIS ON THE **ACCEPTED UNIT RATE AS PER SL NO C OF RATE SCHEDULE SECTION A**. NO OTHER PAYMENT SUCH AS MINIMUM CHARGES FOR CARRIER ETC WILL BE MADE. ALL ARRANGEMENTS INCLUDING TRANSPORT, LABOUR AND OTHER T&P ETC IS IN CONTRACTOR'S SCOPE. THESE GODOWNS ARE EXPECTED TO BE LOCATED WITHIN A RADIUS OF 50 KM APPROX FROM THE PROJECT SITE.

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### MATERIAL HANDLING AND MATERIAL MANAGEMENT SERVICES

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#### 15.1.6

ALL THE RESPONSIBILITIES SPECIFIED IN THE CONTRACTOR'S SCOPE FOR THE MATERIALS RECEIVED BY ROAD SHALL ALSO BE APPLICABLE MUTATIS-MUTANDIS FOR ALL THE CONSIGNMENTS (INCOMING SMALLS) RECEIVED FROM TRANSPORTERS GODOWN/S.

### 15.2 OUTGOING MATERIALS/DISPATCHES

#### 15.2.1

FOR VARYING REASONS MANY A TIMES, PROJECT MATERIALS / BHEL ASSETS ARE TO BE DISPATCHED TO OTHER SITES/LOCATIONS.

#### 15.2.2

CONTRACTOR SHALL IDENTIFY, TAG, PACK AND PREPARE GATE PASSES FOR THE MATERIALS TO BE DISPATCHED. MATERIALS SHALL BE LOADED ONTO THE OUTGOING VEHICLES WITH DUE CARE AND HANDED OVER TO THE TRANSPORTER WITH CLEAR GOODS RECEIPT WHICH SHALL BE SUBMITTED WITH BHEL PROMPTLY. BHEL SHALL MAKE ARRANGEMENT FOR THE TRANSPORT VEHICLES AT ITS OWN COST.

SEPARATE ITEM RATE IS ASSIGNED FOR MATERIAL HANDLING AND MATERIAL MANAGEMENT OF DISPATCH/OUTGOING MATERIALS AND THE PAYMENT WILL BE REGULATED ON PRO-RATA BASIS ON **THE ACCEPTED UNIT RATE AS PER SL NO F OF RATE SCHEDULE SECTION A.**

#### 15.2.3

SUCH MATERIALS WHICH NEED TO BE BROUGHT TO TRANSPORTER'S/RAILWAY GODOWN FOR BOOKING, ARRANGEMENTS SHALL BE ADOPTED AS MENTIONED BELOW:

CONTRACTOR SHALL ARRANGE SUITABLE VEHICLE FOR TRANSPORTATION OF MATERIALS /SMALLS FROM STORES/STORAGE YARD/SITE TO TRANSPORTERS GODOWNS, IDENTIFY, TAG, PACK AND PREPARE GATE PASSES FOR THE MATERIALS TO BE DISPATCHED. MATERIALS SHALL BE LOADED ONTO THE OUTGOING VEHICLE WITH DUE CARE AND HANDED OVER TO THE TRANSPORTER WITH CLEAR GOODS RECEIPT WHICH SHALL BE SUBMITTED WITH BHEL PROMPTLY WITHIN THE ACCEPTED RATES AS PER SL NO C OF RATE SCHEDULE SECTION A

### 16.0 MATERIAL MANAGEMENT SERVICES

#### 16.1

THE CONTRACTOR UNDER THIS CONTRACT SHALL PROVIDE FOLLOWING CATEGORIES OF SERVICES AT THE PROJECT SITE. THE RESOURCES DEPLOYED FOR MM SERVICES BY THE CONTRACTOR SHALL BE AT THE EXCLUSIVE DISPOSAL OF BHEL ON A FULL TIME BASIS. THESE SHALL NOT BE USED FOR ANY ACTIVITIES ASSOCIATED WITH THE NORMAL RESPONSIBILITIES ENVISAGED UNDER THIS CONTRACT OF MATERIAL HANDLING AND MATERIAL MANAGEMENT:

#### A. SUPERVISION/SECRETARIAL SERVICES

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### MATERIAL HANDLING AND MATERIAL MANAGEMENT SERVICES

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WORKING LEVEL SUPERVISION OF EACH WORK SPOT SHALL BE IN THE SCOPE OF CONTRACTOR UNDER REGULAR MATERIAL HANDLING WORK. ON THE OTHER HAND, SUPERVISORY SERVICES UNDER MM SERVICES SHALL BE AT ONE LEVEL HIGHER THAN WORKING LEVEL SUPERVISION BEING DONE AS CONTRACTOR'S RESPONSIBILITY TOWARDS MATERIAL HANDLING WORK. BHEL REQUIRES THAT THESE SERVICES SHALL BE TO OVERSEE AND MONITOR THE VARIOUS OPERATIONS/ACTIVITIES OF MATERIAL HANDLING PROCESS. MM SUPERVISORY SERVICES SHALL ENSURE SETTING BROAD GUIDELINES TO THE WORKING LEVEL SUPERVISORS, MONITORING PROGRESS OF OVERALL PLAN VIS-À-VIS IMPLEMENTATION, PROPER AND PROMPT TRACEABILITY OF STOCK IN THE STORES, IDENTIFICATION OF CORRECTIVE & PREVENTIVE ACTIONS IN MATERIAL HANDLING & STORAGE WORK AND IMPLEMENTATION OF A SYSTEMATIC PROCESS TO FINALLY ENSURE ACHIEVEMENT OF THE PROJECT SCHEDULE.

THESE SHALL ALSO INCLUDE SERVICES OF PERSONAL ASSISTANCE IN THE OFFICIAL WORK OF BHEL'S CONSTRUCTION MANAGER, SECRETARIAL SERVICES FOR CORRESPONDENCES AND DOCUMENTATION OF VARIOUS DEPARTMENTS OF BHEL SITE (ERECTION, COMMISSIONING, FINANCE & ACCOUNTS, STORES/MATERIAL MANAGEMENT ETC).

CONTRACTOR SHALL RENDER THE SERVICES BY ENSURING DEPLOYMENT OF REQUISITE PERSONNEL WITH ADEQUATE (MINIMUM DIPLOMA IN ENGINEERING FOR MM SUPERVISION, GRADUATION FOR SECRETARIAL SERVICES) EDUCATIONAL QUALIFICATION, HAVING THOROUGH EXPERIENCE IN RELATED FIELD TO ENABLE UNDERSTANDING THE INTRICACIES OF AND SPECIAL REQUIREMENTS INVOLVED IN HANDLING OF PROJECT MATERIALS, INCONSISTENCIES AND UNCERTAINTIES ASSOCIATED WITH IN/OUT FLOW OF MATERIALS, PROJECT ACTIVITIES AT ODD HOURS & HOLIDAYS AND IRREGULAR WORKING HOURS. CONTRACTOR SHALL ENSURE PROMPT AND TIMELY AVAILABILITY OF SUCH SERVICES.

**APPROXIMATELY 150 SERVICE-MONTHS**, SPREAD ACROSS VARIOUS NATURE OF SERVICES SHALL BE DEPLOYED PROMPTLY AS PER THE INSTRUCTION OF BHEL.

THE UNIT OF MEASUREMENT OF SUCH SERVICES RENDERED SATISFACTORILY BY ONE PERSON DURING ONE MONTH SHALL BE TERMED AS ONE '**SERVICE MONTH**'.

PAYMENT FOR THE SAME SHALL BE MADE AS PER THE SERVICE-MONTH RATE ACCEPTED IN **ITEM NO H OF RATE SCHEDULE SECTION A**.

#### B. MENIAL SERVICES FOR BHEL OFFICE AND STORES ETC

SCOPE SHALL INCLUDE SERVICES OF OFFICE BOY/ MESSENGER/PEON AT BHEL OFFICE AND STORES, FOR HANDLING CORRESPONDENCES (DAK, DOCUMENTS, DRAWINGS ETC), AND OTHER SERVICES E.G. GARDENING, CLEANING ETC. **APPROXIMATELY 130 SERVICE-MONTHS**, SPREAD ACROSS VARIOUS NATURE OF SERVICES SHALL BE DEPLOYED PROMPTLY AS PER THE INSTRUCTION OF BHEL.

PAYMENT FOR THE SAME SHALL BE MADE AS PER THE SERVICE-MONTH RATE ASSIGNED IN **ITEM NO I OF RATE SCHEDULE SECTION A**.

NOTE: BHEL AT ITS SOLE DISCRETION RESERVES THE RIGHT TO RE-SHUFFLE THE WORK ALLOCATION OF THE PERSONNEL DEPLOYED

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

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**IN CASE THE CONTRACTOR DOES NOT DEPLOY OR DELAYS DEPLOYMENT OF ABOVE SAID MANPOWER WITH REFERENCE TO SPECIFIC INSTRUCTIONS FROM BHEL, BHEL WILL RECOVER NON-REFUNDABLE PENALTY PER DAY OF DELAY IN THE FOLLOWING MANNER:**

**A. SUPERVISION/SECRETARIAL SERVICES @ Rs 500 PER MAN-DAY**

**B. MENIAL SERVICES FOR BHEL OFFICE AND STORES ETC @ Rs 300 PER MAN-DAY**

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter-I B

### Erection Testing and Commissioning of ESP

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

##### 17.1

The intent of specification is to provide services according to the most modern and proven techniques and codes. The omission of specific reference to any method, equipment or material necessary for proper and efficient execution of this work shall not relieve the Contractor of the responsibility of providing such facilities to complete the work without any extra compensation.

##### 17.2

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

##### 17.3

The work shall be executed under the usual conditions affecting major power plant construction and in conjunction with numerous other operations at site. The Contractor and his personnel shall cooperate with personnel of BHEL, BHEL'S Customer, Customer's consultants and other Contractors, coordinating his work with others and proceed in a manner that shall not delay or hinder the progress of work of the project as a whole.

##### 17.4

The work covered under this specification is of highly sophisticated nature, requiring the best quality workmanship, supervision, engineering and construction management. The Contractor should ensure proper planning and successful & timely completion of the work to meet the overall project schedule. The Contractor must deploy adequate quantity of tools & plants, modern / latest construction aids etc. He must also deploy adequate trained, qualified and experienced supervisory staff and skilled personnel.

##### 17.5

Contractor shall erect and commission all the equipments and auxiliaries as per the sequence & methodology prescribed by BHEL depending upon the technical requirements. Availability of materials and fronts will decide this. BHEL Engineer's decision regarding correctness of the work and method of working shall be final and binding on the Contractor. No claims for extra payment from the Contractor will be entertained on the ground of deviation from the methods / sequence adopted in erection of similar sets elsewhere.

##### 17.6

All necessary certificates and licenses, permits & clearances required to carry out this work from the respective statutory/ local authorities are to be arranged by the Contractor at his cost in time to ensure smooth progress of work.

##### 17.7

The boiler shall be erected as per relevant provisions of latest Indian Boiler Regulations (IBR) and amendments/addendums thereof, if any.

##### 17.8

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter-I B

### Erection Testing and Commissioning of ESP

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The work shall confirm to dimensions and tolerances specified in the various drawings / documents that will be provided during various stages of erection. If any portion of work is found to be defective in workmanship, not conforming to drawings or other stipulations due to Contractor's fault, the Contractor shall dismantle and re-do the work duly replacing the defective materials at his cost, failing which the work will be got done by BHEL and recoveries will be effected from the Contractor's bills towards expenditure incurred including cost of materials and departmental overheads of BHEL.

#### 17.9

The Contractor shall perform any services, tests etc, which may not be specified but nevertheless, required for the completion of work within quoted rates.

#### 17.10

All necessary certificates and licenses required for carrying out this work are to be arranged by the Contractor expeditiously.

#### 17.11

The Contractor shall execute the work in the most substantial and workman like manner. The stores shall be handled with care and diligence.

#### 17.12

BHEL reserves right to recover from the Contractor any loss which arises out of undue delay / discrepancy / shortage / damage or any other causes due to Contractor's lapse during any stage of work. Any loss to BHEL due to Contractor's lapse shall have to be made good by the Contractor.

#### 17.13

All cranes, transport equipment, handling equipment, tools, tackles, fixtures, equipment, manpower, supervisors/engineers, consumables etc, except otherwise specified as BHEL scope of free issue, required for this scope of work shall be provided by the Contractor. All expenditure including taxes and incidentals in this connection will have to be borne by Contractor unless otherwise specified in the relevant clauses. The Contractor's quoted rates should be inclusive of all such contingencies.

#### 17.14

During the course of erection, testing and commissioning certain rework / modification / rectification / repair / fabrication etc may become necessary on account of feed back / revision of drawing etc. This will also include modifications / re-works suggested by BHEL / customer / other inspection group. Contractor shall carry out such rework / modification / rectification / fabrication / repair etc promptly and expeditiously. Daily log sheets signed by BHEL engineer and indicating the details of work carried out, man-hours etc shall be maintained by the Contractor for such reworks. Claim of Contractor if any, for such works will be governed by relevant clauses of 'General Conditions of Contract'.

#### 17.15

All works such as cleaning, leveling, aligning, trial assembly, dismantling of certain equipments / components for checking and cleaning, surface preparation, fabrication of structures, tubes and



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pipes as per general engineering practice and as per BHEL Engineer's instructions at site, cutting, gouging, weld depositing, grinding, straightening, chamfering, filing, chipping, drilling, reaming, scrapping, lapping, fitting up etc as may be applicable in such erection works and which are treated incidental to the erection works and necessary to complete the work satisfactorily, shall be carried out by the Contractor as part of the work within the quoted rates.

#### 17.16

The Contractor shall make all fixtures, temporary supports, steel structures required for jigs & fixtures, anchors for load and guide pulleys required for the work. Contractor shall arrange necessary steel for such usage.

#### 17.17

The Contractor shall take delivery of the components, equipments, chemicals, and lubricants etc from the BHEL stores/ storage area after getting the approval of BHEL Engineer on standard indent forms of BHEL. Complete and detailed account of the materials and equipments after usage shall be submitted to the BHEL and reconciled periodically.

#### 17.18

The distance between storage area and erection site is approx 1 KM. Contractor shall plan and transport equipments, components from storage to erection site and erect them in such a manner and sequence that material accumulation at site does not lead to congestion at site of work. Materials shall be stacked neatly, preserved and stored in the Contractor's shed and at work areas in an orderly manner. In case it is necessary to shift and re-stack the materials kept at work areas/ site to enable other agencies to carry out their work or for any other reason, same shall be done by Contractor most expeditiously as incidental to work.

#### 17.19

Plant materials should not be used for any temporary supports / scaffolding/ preparing pre-assembly bed etc.

#### 17.20

The details of equipments to be erected under this contract are generally as per the schedule given in relevant appendices. These details are approximate and meant only to give a general idea to the tenderer about the magnitude of the work involved. Actual quantum and type of equipments will be based on the relevant erection documents which will be furnished to the Contractor in due course of erection and the weight and quantity as per the relevant engineering documents will only be admissible for the billing purpose.

#### 17.21

Hangers & suspensions, supports etc for tubes, piping, & ducts etc will be supplied in running / random lengths / sizes which shall be cut to suitable sizes and adjusted as required.

#### 17.22

Spring suspension / constant load hangers may have to be pre-assembled for required load and erection carried out as per instructions of BHEL. Adjustments, removal of temporary arrests/locks, cutting of excess thread length of hanger tie-rod etc have to be carried out as and when required. Load setting of spring hangers, as per BHEL's documents/instructions, during

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various stages of erection & testing and after floating of piping/ducting during cold and hot condition will have to be done as part of work. This exercise may have to be repeated till satisfactory results are achieved.

#### 17.23

Layout of field routed/ small bore piping shall be done as per site requirement. Necessary sketch for routing these lines should be got approved from BHEL by the Contractor. There is a possibility of slight change in routing the above pipe lines even after completion of erection.

#### 17.24

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

- I. ITEMS ARE NOT SPECIFICALLY INDICATED UNDER THE RESPECTIVE PRODUCT GROUPS AS GIVEN IN THE TECHNICAL SPECIFICATIONS.
- II. ITEMS ARE SUPPLIED BY AN AGENCY OTHER THAN BHEL.

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

#### 17.25

Actuators/drives of valves, dampers, gates, powered vanes etc may have to be serviced, lubricated, before erection, during pre-commissioning & commissioning, including carrying out minor adjustments required as incidental to the work.

#### 17.26

All electrical motors have to be tested for IR & PI values prior to the trial run. Where required, dry out may have to be carried out by using external heating source. Contractor shall make all arrangements in this regard and complete the work as instructed. BHEL will provide the motorized insulation testers.

#### 17.27

In installation of various equipments it may become necessary to install these on temporary supports/ hanger due to various reasons including non-availability of suspension materials. Contractor shall install such temporary suspensions/hangers and later on shift the relevant equipments to their respective permanent hangers/ suspensions/ supports as incidental to work. Requisite materials for such temporary arrangements will be provided by BHEL on free - returnable basis which shall be returned to BHEL after the use.

#### 17.28

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

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The work shall be carried out strictly in accordance to the “Field Quality Plan” approved by BHEL/client. Contractor, jointly with BHEL, shall prepare all necessary records of measurements/readings/ protocols etc.

#### 17.29

All works such as cleaning, levelling, aligning, trial assembly, dismantling of certain equipments / components for checking and cleaning, surface preparation, fabrication of sheets, tubes and pipes as per the general engineering practice and as per BHEL engineers instructions at site, cutting, weld desposing, grinding, straightening, chamfering, filing, chipping, drilling, reaming, scraping, lapping, fitting up etc as may be applicable in such erection works and which are treated incidental to the erection work and necessary to complete the work satisfactorily shall be carried out by the Contractor as part of the work.

#### 17.30

Interconnection/ hookup, if any, with the existing system shall form part of work. Such interconnections, hookups may require shut down of running plant and the relevant work have to be completed within such planned shutdowns. This may call for working with enhanced resources and on extended hours. Contractor's offer shall cover all such contingencies.

#### 17.31

Contractor shall regulate flow of material to and from site in such a manner and sequence that material accumulation at site does not lead to congestion at site. In case it is necessary to shift and restack the materials kept at work areas / site to enable other agencies to carry out their work or further any other reason, it shall be done by the Contractor most expeditiously. No claim for extra payment for such work will be entertained.

#### 17.32

It may so happen that certain components like manhole doors, hanger etc may be supplied in loose items. They need to be assembled as per relevant drawings or as per advice of BHEL engineer prior to erection. This forms the part of the scope of work.

#### 17.33

The Contractor shall have total responsibility for all equipment and materials in his custody at Contractor's stores, loose, semi-assembled, assembled or erected by him at site. He shall effectively protect the finished works from action of weather and from damages or defacement and shall also cover the finished parts immediately on completion of work as per BHEL engineer's instructions. The machine surfaces/finished surfaces should be greased and covered.

#### 17.34

BHEL is operating web based computerized site operation management system (SOMS) that includes, inter-alia, issue of materials, daily progress reporting, Contractor's running monthly billing and material reconciliation through a computerized data management system. Contractor shall install necessary hardware to hook-up with the BHEL's system and use the same for his scope of work.

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

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### Erection Testing and Commissioning of ESP

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In the event the computerized SOMS is inoperative for any reasons, the Contractor shall take delivery of materials from the storage area/sheds of BHEL/customer after getting the approval of the engineer/customer on standard indent forms to be specified by BHEL/customer. All these records however shall be updated in the SOMS as and when the soms is reactivated/normalized.

17.35

Gases like argon, oxygen, acetylene etc that are required for erection related activities shall be arranged by the Contractor at his cost. For T-91 material site weld joints argon as per grade-3 of is 5760: 1998 with oxygen and water vapour restricted to max 6 ppm each and with argon purity level of minimum 99.99% shall be arranged and used by the Contractor. The supply should accompany test certificate for the batch indicating individual element 'ppm' level and overall purity level.

17.38

All lubricants and chemicals required for testing, preservation, chemical cleaning / acid cleaning, oil flushing, and the lubricants for trial runs of the equipments and trial operation of the unit will be supplied by BHEL free of charges.

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## Chapter-I B

### Erection Testing and Commissioning of ESP

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#### DETAILS OF SCOPE OF WORK FOR ERECTION TESTING AND COMMISSIONING

The scope of work is further detailed in the specifications hereinafter.

#### 18.1 ERECTION OF ELECTROSTATIC PRECIPITATOR

##### 18.1.1

Wherever called for, pre-assembly of supporting structures, casing walls, inlet outlet funnels, hoppers etc have to be done, on ground prior to erection in position.

##### 18.1.2

ALL SITE WELD FOR CASING, INLET & OUTLET DUCTING CONNECTIONS HAVE TO BE TESTED FOR ESTABLISHING LEAKPROOF JOINTS.

##### 18.1.3

Loading of collecting electrodes either from top or bottom, to be decided suiting site conditions, shall be done with due care as per instructions.

##### 18.1.4

Straightness of all collecting electrodes has to be checked on ground prior to loading in to the field.

##### 18.1.5

Bundle of collecting electrodes should be handled only with special lifting beam and slings supplied for the purpose.

##### 18.1.6

BHEL will supply Huck bolting M/c with necessary auxiliaries free of charges. However, electrical connections, operation etc shall be arranged by the Contractor.

##### 18.1.7

Clearances as prescribed amongst collecting electrodes and with casing walls have to be maintained. Spot heating of collecting electrodes, wherever called for, shall be done as part of work to achieve the required clearances.

##### 18.1.8

Erection, alignment/ fixing in final position, testing & commissioning of high voltage rectifiers of ESP is in the scope of work. ~~However testing & commissioning will be done by other agency.~~

##### 18.1.9

Installation of high voltage interlocks (~~excepting rotary switch interlock of switchgear panels~~) is in the scope of work.

##### 18.1.10

Complete erection, alignment, testing, pre-commissioning and commission etc for drive motors of collecting electrodes and emitting electrode rapping mechanism is in the scope of work.

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## Chapter-I B

### Erection Testing and Commissioning of ESP

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#### 18.1.11 **AIR LEAK TEST**

After erection of ESP and before clearing for insulation, air leak test has to be carried out. Necessary equipment like, air blower, ventury and instrumentation etc. will be provided by BHEL free of charges. Handling at stores, transport, erection, commissioning and carrying out the leakage test, attending to the leakages till satisfactory sealing / leak proofness shall be in scope of the work. Contractor shall dismantle the test equipments and return to BHEL stores in good condition after due reconciliation, cleaning and servicing. No separate/ additional payment is envisaged for the above.

#### 18.2 **MAIN SUPPORTING STRUCTURES, EXTERNAL STRUCTURES, ELEVATOR STRUCTURES, STAIRWAYS, GALLERIES & PLATFORMS & HANDLING ARRANGEMENT**

##### 18.2.1

Quality norms with regard to verticality of column, inter-alia, have to be adhered to strictly, at various stages of erection.

##### 18.2.2

Stiffening / strengthening of main supporting structure, if any, due to deviation in verticality of columns shall be carried out, including fabrication, if any. Necessary steel for this will be provided in random sizes by BHEL as free issue. Payment for such stiffening/ strengthening shall be made for weight certified by BHEL engineer at the item rate applicable to ESP, provided the deviation has occurred for the reasons not attributable to the Contractor.

If the deviations are attributable to Contractor, the materials required for Rectification / Stiffening / Strengthening, fabrication, erection of the same shall be to the Contractors account.

##### 18.2.3

It is likely that, in deviation from prescribed sequence, erection of certain elements of structure may be deferred for later stage, this may necessitate temporary installation of some structural steels at appropriate locations to keep the stability of structure intact. such temporary installations shall be removed subsequently and returned to BHEL stores/ storage yard. Finishing work in the related permanent structures shall be done as per the instruction of BHEL engineer. BHEL will provide necessary steels on free issue basis in random sizes for such installations, which shall be fabricated by the Contractor to suit the requirement.

Payment for such installations shall be made on the accepted tonnage rate of ESP. No separate payment will be made for fabrication, removal & return of the materials to BHEL stores.

##### 18.2.4

In some cases, the structural material will be supplied in random lengths, which have to be fabricated to suit the requirement as incidental to work. Also, it may sometimes be necessary to remove some of the erected members to facilitate erection of bigger/ pre-assembled

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter-I B

### Erection Testing and Commissioning of ESP

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equipments. In such cases, the removal and re-erection of such members as agreed by the BHEL Engineer, will have to be done by the Contractor as incidental to work.

#### 18.2.5

**Contractor shall arrange materials required for temporary cat ladders & working platforms** during erection of columns, platforms and other structural components. Such arrangements shall, as far as possible, be only of clamping & bolting type, as welding on columns etc will not be permitted. After the completion of work these shall be removed.

#### 18.2.6

All the hand rails and toe guards shall be provided as per drawings and site requirement. hand rails supplied in running lengths shall be suitably cut, edge prepared and welded. Also, hand rails/ guards may have to be provided from the safety point of view in certain places though not indicated in the erection drawings. The weld joints of hand rails shall be ground smooth to flush finish.

#### 18.2.7

Electroforged floor grills will be supplied for this project. These may have to be cut to suit requirement. Cutting shall be done only by mechanical cutters **and not by gas cutting**. Cold galvanizing compound is to be applied on the cut surface/edge. Cold galvanizing paint will be supplied by BHEL free of cost.

Fixing of floor grills shall be done by self-tapping screws **and not by weldable studs**. Special purpose electrically operated hand tools are available in the market for this, which drills, taps and fixes the screws in a single operation. BHEL will supply the necessary self-drilling-cum-tapping screws and fixing clips. Contractor shall deploy the **drilling cum fixing machine** required for this purpose as a regular scope of work.

**SIMILARLY ROOF SHEETING MAY HAVE TO BE FIXED WITH SELF-TAPPING SCREWS.**

#### 18.2.8

The Contractor shall also install additional platforms of permanent nature for approaching different equipment as per the site requirement and to meet O&M requirements, though these may not be indicated in the erection drawings. Materials required for such platforms will be supplied by BHEL in random sizes on free issue basis. These have to be fabricated to suit the requirement. Payment only for erected weight as certified by BHEL engineer shall be made at the rate applicable for structures. No payment is envisaged for fabrication of structures.

#### 18.2.9

All relevant provisions as above shall apply, mutatis-mutandis, to the work of external structures, interconnecting structures, elevator structures, ESP stairways and galleries & equipment handling system etc.

### 18.3 OTHER PRODUCTS AND SYSTEMS AND COMMON REQUIREMENTS



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- a) Ducts / expansion bellows (metallic & non-metallic) are normally supplied in loose components / segments and these are to be assembled and welded/ jointed at site before erection. The fabric portion of non-metallic expansion joints (NMEJ) namely bolster, fabric belt and canopy shall be installed by Contractor under supervision/guidence of equipment supplier/BHEL for the first few cases. Contractor shall ensure that all subsequent NMEJ are assembled with due care and proper procedure. In similar manner all joints, connecting ducts, expansion pieces and dampers shall be seal welded. These welds have to be made leak proof and tested as per technical instruction / requirement.
- b) Certain structural items, roof cladding structure, platform etc will be supplied in running lengths which shall be cut to required suitable sizes and adjusted/trimmed as part of work.
- c) ADDITIONAL PLATFORMS OF PERMANENT NATURE FOR APPROACHING DIFFERENT EQUIPMENTS, AS PER SITE REQUIREMENT, WHICH MAY NOT BE INDICATED IN DRAWINGS, SHALL BE FABRICATED AND INSTALLED BY THE CONTRACTOR. SIMILARLY CANOPIES FOR MOTORS, ACTUATORS ETC MAY HAVE TO BE ERECTED. HOWEVER, THE CONTRACTOR WILL BE PAID FOR THIS WORK ON ACCEPTED TONNAGE RATE FOR STRUCTURES. BHEL WILL SUPPLY THE MATERIAL REQUIRED FOR PLATFORMS/CANOPIES IN RANDOM LENGTHS & SIZES THAT SHALL BE FABRICATED WITHOUT ANY EXTRA PAYMENT.
- d) Actuator / drives of dampers, gates etc may have to be serviced, lubricated before erection, during precommissioning and commissioning, including carrying out adjustments required as incidental of the work.
- e) All welded joints should be painted with anticorrosive paint / primer immediately after completion of all work. Necessary paints and other consumables for the above work are in the scope of the Contractor.
- f) Spring suspension / constant load hangers may have to be preassembled for required load and erection carried out as per instruction of BHEL adjustments, removal of temporary arrests / locks, cutting of excess thread length of hanger, tie rod etc, have to be carried out as and when required. Load setting of spring hangers, as per BHEL's documents / instructions, during various stages of erection and testing and after floating of piping / ducting during cold and hot condition will have to be done. This exercise may have to be repeated till satisfactory results are achieved.
- g) Hangers and suspensions, support steels for ducts and other equipments, piping etc will be supplied in running/random lengths/ sizes, which shall be cut to suitable sizes and adjusted as required.
- h) Touch up and preservative painting of all components issued to and/or erected by Contractor shall form part of scope of work. The Contractor shall arrange all paints, primer and consumables, T&P and facilities.



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#### **19.0 PREPARATION OF FOUNDATIONS, AND GROUTING OF EQUIPMENT**

##### **19.1**

Building foundations and other necessary civil works for supporting structures, equipments etc will be provided by BHEL / Customer. The checking of dimensional accuracy, axes, elevation, levels etc, with reference to bench marks of foundations and anchor bolt pits have to be checked and logged by the Contractor. The permanent benchmark / reference marks will have to be transferred to new locations with sufficient care to maintain the accuracy and protected / preserved with adequate care (to enable rechecking at later dates) as per BHEL instruction.

Minor adjustment of foundation level, dressing and chipping of foundation surfaces and blue-matching (wherever required) for of all equipments as per BHEL Engineers instructions, should be done by the Contractor as part of the work. Contractor/BHEL shall prepare protocols before taking over the foundations. Dressing and chipping of foundations upto 35mm for achieving proper levels will be within the scope of work/specification.

##### **19.2**

All temporary foundations and anchor points required for installing erection Equipments and winches, foundations for pumps, tanks etc are in the scope of Contractor. All building materials like cement, steel including re-inforcement bars, grits cements etc for such temporary foundations shall have to be arranged by the Contractor within the quoted rates. All such foundations shall be demolished and normal ground conditions restored after the usage.

##### **19.3**

Contractor shall carry out scrapping and blue matching of embedded plates/ packers. Chipping and the leveling of concrete surfaces, fine dressing up to the extent required to obtain contact between packer and concrete, is also covered in the scope of this work. Scrapping, chipping and matching shall be done so as to achieve prescribed percentage of contact between the two surfaces.

##### **19.4**

BHEL will provide free of cost only the shims and packer plates (either machined or plain) which go as permanent part of the equipment. Certain packer plates and shims over and above the quantity received as a part of supplies from manufacturing units of BHEL will have to be cut out from steel plates / steel sheets at site to meet site requirement. Contractor shall cut and prepare packers and shims by gas cutting / chiseling / grinding and de-burr the same. However, machining of the packers wherever necessary shall be arranged by contractor.

##### **19.5**

Complete grouting of structures equipments, including anchor/ foundation bolts, beneath base, base hollows etc, as may be applicable, is included in the scope of Contractor. Arranging all labour, building materials including cement, ordinary portland as well as quick setting – free flow - non-shrink grout mix (e.g. conbextra gp1/gp2), form work, shuttering, and any other requirements is in the Contractor's scope. Contractor shall obtain approval of BHEL for cement (Ordinary Portland as-well-as quick setting – free flow- non-shrink grout mix) prior to use. Cleaning of foundation surfaces, pocket holes and anchor bolt pits and de-watering and making

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them free of oil, grease, sand and other foreign materials by soda washing, water washing, compressed air and other approved methods are within the scope of this specification/ work.

19.6

After the grouting has finally set and cured, alignment of equipments involved shall be checked again to verify for any disturbance or any other reason. If required, de-coupling of equipments has to be done for conducting the verification. In case any disturbance is noticed the cause, if any, shall be removed and re-alignment done as part of work.

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

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##### **20.1 WELDING**

###### **20.1.1**

Installation of equipment involves good quality welding, NDE checks, post weld heat treatment etc. Contractor's personnel engaged should have adequate qualification on the above works.

###### **20.1.2**

The method of welding (viz) arc, TIG or other method will be indicated in the detailed drawing/documents. BHEL Engineer will have the option of changing the method of welding as per site requirement.

###### **20.1.3**

VOID

###### **20.1.4**

VOID

###### **20.1.5**

Before any welder is engaged on work, he shall be tested and qualified by BHEL/ customer, though they may possess the IBR/other certificate. BHEL reserves the right to reject any welder without assigning any reason. All the expenditure in testing/qualification of the Contractor's welder shall be borne by Contractor.

###### **20.1.6**

Unsatisfactory and continuous poor performance may result in discontinuation of concerned welder.

###### **20.1.7**

The welded surface shall be cleaned of slag and painted with primer paint to prevent rusting, corrosion. For this consumables like paint /primer etc will be in the Contractor's scope.

###### **20.1.8**

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###### **20.1.8**

The Contractor shall maintain welding records in the form as prescribed by BHEL containing all necessary details, and submit the same to the BHEL Engineer as required. Interpretation of the BHEL Engineer regarding acceptability of the welds shall be final.

###### **14.1.10**

VOID

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#### 20.1.9

Joint fit up will be a stage of inspection. Where required, joints shall be offered for visual inspection after root run. Subsequent welding should be made only after the approval of root run.

#### 20.1.10 SOCKET WELDING

In execution of this work, considerable number of socket weld joints is involved. The exact quantity of such socket welds or probable variation in the quantum cannot be furnished. The tenderer shall take notice of this while quoting as no extra claim on this account will be entertained.

#### 20.1.11

Welding electrodes have to be stored in enclosures having temperature and humidity control arrangements. This enclosure shall meet BHEL specifications.

#### 20.1.12

Welding electrodes, prior to their use, call for baking for specified period and will have to be held at specified temperature for specified period. Also, during execution, the welding electrodes have to be carried in portable ovens.

### 20.2 HEAT TREATMENT:

#### 20.2.1

For the purpose of temperature recording of stress relieving process wherever applicable, thermocouples have to be attached to the weld joint. The number of temperature measuring points and locations shall be as per the standards of BHEL. Thermocouples have to be attached using capacitor discharge type portable thermocouple attachment unit. Contractor shall arrange sufficient number of thermocouple attachment units.

#### 20.2.2

Contractor should provide temperature indicator / temperature recorder for measuring temperature during pre-heating for welding or for controlling temperature of metal for hot correction etc. The temperature recorders should be preferably of solid state type.

#### 20.2.3

Heat treatment may be required to be carried out at any time (day or night) to ensure the continuity of the process. The Contractor shall make all necessary arrangements including labourer required for the same as per directions of BHEL.

#### 20.2.4

In certain cases only the pre-heating of weld joints may be called for.

#### 20.2.5

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For weld joints of heavy structural sections, if heat treatment is required, the same shall be carried out as part of the work.

#### 20.2.6

Checking effectiveness of stress relieving by hardness tests (by digital hardness tester or other approved test methods as per BHEL Engineer's instruction) including necessary testing equipments is within the scope of the work / specification.

#### 20.2.7

All the recorded graphs for heat treatment shall be handed over to BHEL/ IBR authorities and due clearances obtained.

#### 20.2.8

Results of these processes shall be verified/ validated as per requirements of BHEL/client.

### 20.3 NON DESTRUCTIVE EXAMINATION:

#### 20.3.1

Contractor shall provide all resources and make all arrangements for the radiographic examination of welds for this work for reasons of safety; invariably the radiography work will be carried out after the normal working hours and close of other site activities only. In this regard, the Contractor has to adhere to the safety rules / regulations laid by barc authorities from time to time.

#### 20.3.2

Radiography inspection of welds shall be performed in accordance with requirements and recommendation of BHEL Engineer. The minimum quantum of radiographic inspection shall be as per provision of IBR/BHEL's erection documents. They may, however be increased depending upon the performance of the individual welder at the discretion of BHEL Engineer/Boiler inspecting authority. Bidder shall also arrange the UT equipment with recording facility at his own cost. Usage of UT equipment shall be as per direction of BHEL engineer. Records of UT shall be produced as per site requirement.

#### 20.3.3

All X-Ray / Gamma Ray films of weld joints shall be preserved properly and be handed over to BHEL and requisite clearances shall be obtained by the Contractor.

#### 20.3.4

The field welded joints shall be subject to Dye-penetrant/MPT/RT/ other non-destructive examination as specified in the respective engineering documents/ as instructed by BHEL.

#### 20.3.5

Wherever required, surface preparation, like smooth grinding of welded area, prior to Radiography shall be done. It may also become necessary to adopt inter-layer radiography/MPT/UT depending upon the site/ technical requirement necessitating interruptions in continuity of the work and making necessary arrangements for carrying out the above work.

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The Contractor shall take all this into account in his offer. The required NDT method/procedure will be decided by BHEL engineer at site.

#### 20.3.6

Tenderer shall note that 100% radiography shall be taken on all high pressure welding till such time the welders' performance is found by BHEL Engineers to be satisfactory. Subsequently, subject to consistency in welder's performance, the percentage of radiography will be based on BHEL's standard practice/code requirement. The defects shall be rectified immediately and to the satisfaction of BHEL engineer. The decision of BHEL engineer regarding acceptance / rejecting the joints will be final and binding on the Contractor.

#### 20.3.7

100% radiograph of certain sizes in piping have to be taken as per BHEL standards/ drawings.

#### 20.3.8

For carrying out ultrasonic testing of welding joints of large size tubes and pipes, it will be necessary to prepare surface by grinding and buffing a smooth finish and contour as necessary. The Contractor's scope of work includes such preparation as incidental to work.

#### 20.3.9

Contractor may have to undertake radiography with cobalt-60 isotope camera in certain cases. However, for any reason if use of Cobalt-60 is not possible then these joints shall be checked by radiography after completion of welding up to suitable part of thickness with IR-192 other suitable source subsequently after completing the joint UT to be done. For this Contractor has to deploy level-II operator certified by BARC.

#### 20.3.10

No separate payment for any NDE activities (including radiography) will be made.

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#### **21.0 Electrical & C&I works**

Erection and Commissioning of all electrical and C&I Supplied items of ESP in the scope of supply of BHEL Units for this project like control room inserts, cables, earthing, cable trays, junction box, heating elements, interlocks, auxiliary control panel, rapper control panel, statcon panel, LT switch board, ESP switch gear, Bapcon and Accessories, opacity monitor and accessories, ash level indicators etc, is in the scope of work.

#### **21.1 Installation of Cable trays/cable ducts**

**21.1.1** Various types of sheet metal, galvanized cable tray, i.e. Perforated, ladder type, seal metal duct, solid bottom tray, shall be provided in standard lengths along with accessories like hardware, bends, reducers, coupler plate, tray covers and tray clamps etc.

##### **21.1.2**

Installation of cable tray/cable duct shall include cutting, laying, jointing, supporting, drilling holes in the support, providing tees/reducers/bends/clamps as per tray route layout, fabrication of bends/tees/reducers from straight length, fixing of tray covers, welding of tray on support, cleaning and application of cold galvanizing paint on weld joints (supply of paint is in the scope of contractor). Installation of tray/duct covers, wherever provided, will be done as a part of tray erection and no extra rates will be payable.

##### **21.1.3**

In case cable trays are required to be fabricated from structural steel and installed, unit rate applicable for ESP shall be applicable in such instance.

##### **21.1.4**

Cable trays/ducts have to be routed underground in cable trench, over head on structure, valves, floors etc. for various applications such as cable laying, copper tubes, conduits, thermocouple, temperature gauge capillary etc.

##### **21.1.5**

Installation of Copper tubes/SS tubes/copper pipes shall include cutting into required length, laying, bending, cleaning, brazing wherever required, fixing of brass fittings like compression fittings/tees/end connectors/straight connectors/bulk heads/valves etc., supporting clamping including supply of clamps and hardware, flushing and conducting leak test.

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**21.2 Cable laying (power / control / instrumentation shielded / unshielded cables / plug-in cables / coaxial / UTP / STP / data highway, armoured / un-armoured, single / multi-core, PVC/HR PVC/FRLS/TEFLON/XLP insulation, optical fibre)**

#### **21.2.1**

Cable laying includes cutting to the required length, laying in overhead/underground cable trench/through pipes/flexible conduits, dressing/clamping in tray, drilling of holes in gland plates in panels and junction box, glanding, splicing, dressing of spliced wire inside the panel and JB's, providing PVC numerical/alphabetical / printed ferrules, termination by using crimp type copper tinned/aluminium lugs, insulated/un-insulated, termination (crimp, soldering, etc.), plug-in connections with insert type crimping, providing identification PVC/aluminium cable tags (at both the ends and at 15 m intervals throughout the route length and also at each bend), continuity checking, insulation resistance checking, high voltage test on HT cables.

Laying, etc of Optical fibre cables on cable trays /cable trench shall necessarily be done using flexible conduit

#### **21.2.2**

Entry to the panels and JB's may be at top, sides or bottom. All cables are required to be properly supported and clamped near to the JB/panel.

#### **21.2.3**

Wherever cable glanding is not possible, either due to the gland plate size limitations or more number of cable entries, prefab plug-in cables, etc., for such cases cables may have to be lifted inside the panel by either making cut-out in gland plate and providing rubber profile for sharp edge protection or alternatively, providing 4" or 6" PVC pipe coupling gland and these pipe coupling gland shall be supplied by contractor within the quoted rate .

#### **21.2.4**

Copper tinned lugs of various types (pin, ring, fork, snap-on) upto 4 sq.mm, PVC cable ties, PVC ferrules, PVC button and tapes, cable identification tag of PVC/metallic, clamping and dressing material with hardware, PVC sleeves etc. shall be supplied by the contractor within the quoted rates. The quality of material shall be got approved from BHEL engineer prior to their use on job.



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#### **21.2.5**

All care should be taken to avoid abrasion, tension, twisting, kinking, stretching of cables during installation.

#### **21.2.6**

Cable shielding – all signal cables are supplied with bare shielded copper wire/with braided wire shield. Generally shield wire is kept isolated at instrument/field device end and continuity is maintained through JBs and grounded at panel end only. While terminating the shield wire either in panel or JBs, PVC sleeves are to be used to avoid two-point earthing.

#### **21.2.7**

Wherever cables run through ducts, conduits, valves, etc., they shall be sealed using fire/weather proof compound. In addition to this, cable entry in panels, MCCs, instruments, electrical actuators etc., are also required to be sealed. The required material for doing so shall be included by contractor in the cabling scope.

#### **21.2.8**

Many of the cable trays and cables have to be laid in cable trenches. For this purpose, the cover of the trenches have to be opened for working in site and whenever the cables are to be laid in existing cable tray, all safety precautions have to be observed.

After completing the work, the trenches have to be cleaned and covers put back into position. Contractor shall also carry out de-watering from the trenches if required and arrange pumps etc., at his cost.

#### **21.2.9**

Looping wire at terminal block of panels and electrical actuator as shown in the inter-connection diagrams or as required is to be done by contractor at no extra cost.

#### **21.2.10**

Contractor shall carefully plan the cutting schedule of each cable drum in consultation with site engineer such that wastage are minimized.

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#### 21.2.10.1

The erection contractor shall make every effort to minimize wastage during erection work. In any case, the wastage shall not exceed the following limits;

| <b>SI No.</b> | <b>Item</b>                             | <b>% Wastage on issued Qty</b> |
|---------------|---|--------------------------------|
| 1.            | Fabrication steel                       | 2                              |
| 2.            | Each size of power cables               | 1                              |
| 3.            | Each size of control/Inst cables        | 2                              |
| 4.            | Impulse pipe/tubes/GI pipes/copper tube | 1                              |

If the actual wastage be more than the specified figure, then equivalent price of the excess portion will be deducted from the contractor's bill.

#### 21.3 Junction Boxes :

Different type of junction boxes are to erected by the contractor like junction boxes below 48 ways and above 48 ways. The junction boxes are to be located at the locations jointly decided at site during erection. The junction boxes are to be erected on the frames fabricated at site.

#### 21.4 Installation of panels

##### 21.4.1

Electrical control panels, electronic control panels, etc., are normally supplied in suit of either one/two/three or loose shipping sections with integral base frame or loose supplied.

These panels may have to be installed as stand alone or in groups consisting of number of panels in each row, depending upon the plant layout and foundation arrangement.

##### 21.4.2

Installation of panel shall include fixing of base frame, fabrication of base frame if required, levelling, alignment, fixing of anti-vibration pads, removal of side covers, fixing of cubicle interconnection hardware, bus bar jointing, wiring interconnection, welding and grouting of panels and base frames, mounting of panel canopy wherever supplied as part of panel, drilling of gland plates and sealing of cable entries. In certain case

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where canopies are not supplied but have to be fabricated out of MS sheets provided by BHEL, payment will be done on square meter basis.

#### **21.4.3**

Panels have to be shifted to their locations through floor openings, temporary openings like floor grills, door etc. which shall be part of work and no claim whatsoever will be entertained with regard to non-availability of opening as per shortest route etc. Panel have to be erected at different locations and elevation in ESP control room etc.

#### **21.4.4**

Panel and instruments once erected in position should be properly protected using necessary care to prevent ingress of dust/moisture. This will have to be periodically cleaned and surroundings have to be kept tidy.

#### **21.4.5**

Wherever the panels to be mounted on cable trenches, channel supports have to be provided across the cable trench over which the base frame of panel shall be mounted. For such work, structural steel fabrication, installation rates shall be applicable.

#### **21.4.6**

Normally the panels shall be supplied with instruments, relays, meters, electronic modules etc. mounted and pre-wired. However, if these are supplied loose / separately for safety in transit, contractor shall mount/wire such devices as part of the panel installation work and no separate rates shall be applicable for this.

#### **21.4.7**

No separate payment shall be made for replacement of any devices like electronic modules, relays, conductors, terminal block, push buttons etc. which are found defective during pre-commissioning / post-commissioning of any equipment / item.

#### **21.4.8**

commissioning/calibration work and trouble shooting has to be carried out by the contractor as part of testing and commissioning work as per the quoted rates.

#### **21.4.9**

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Minor civil works like drilling, chipping, punching holes and opening in concrete floors, slabs and brick walls, grouting, related to Rack, support installation, minor civil works required for installation of control panels, Junction boxes etc., shall be included in the erection cost of such items. Also all miscellaneous civil works like chipping away and making good as necessary in floor slab/wall for cabling / earthing etc., as required are included in the scope for which no separate payment is applicable. The scope also includes supply of grouting material, if any.

#### **21.4.10**

Supplier's instruction manuals, packing slips, door keys etc. received along with the panels should be promptly handed over to BHEL's engineer on opening of the panels.

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#### **22 LINING AND INSULATION**

Application of insulation, finishing, cladding and outer casing etc for ESP:

##### **22.1**

The work shall conform to dimension and tolerances specified in the various drawing and documents that will be provided during the execution. If any portion of the work is found to be defective in workmanship or not conforming to drawings or other specifications, the Contractor shall dismantle and re-do the work duly replacing the defective materials at his cost, failing which the work will be got done by engaging other agencies or departmentally and recoveries will be deducted from Contractor's bills towards expenditure incurred including 30% departmental charges.

##### **22.2**

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

##### **22.3**

All insulation and refractory materials including iron components and outer sheet casing materials, cladding sheets etc required will be supplied by BHEL and the same have to be erected/ applied as per the drawings and specifications of BHEL by the Contractor.

##### **22.4**

The Contractor shall provide all the necessary scaffolding materials, temporary structures and necessary safety devices etc, during all stages of work. Scaffolding materials (poles, gratings etc) shall be of light weight construction. Contractor shall arrange steel pipes & clamps with accessories like base plate attachment, fixing pins, struts etc for scaffolding required for this work. However, BHEL's decision in this regard shall be final and binding. Contractor shall arrange the scaffolding materials in sufficient quantity.

The Contractor shall provide the required quantity of wire, nails, and planks for formwork and other materials for shuttering and curing works.

##### **22.5**

Contractor shall observe all precaution for laying, curing etc of pourable insulation. The Contractor at his own cost shall redo any defective works found.

##### **22.6**

Wool insulation is received at site as loose bonded mattresses in standard sizes. These are to be dressed/cut to suite the equipments. Multiple layers of wool have to be applied as directed and as per drawings and specifications for all equipments/ systems covered under the scope of work.

##### **22.7**

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Cutting & dressing of insulation bricks to suit the site area of application is incidental to work.

22.8

Removable type of insulation has to be provided for valves fittings, expansion joints etc as per drawing or as directed by BHEL Engineer.

22.9

The cladding and outer casing are aluminium sheets. All relevant specifications and procedures with regards to beading, sealing etc for aluminium sheets have to be adhered to.

22.10

Cladding/outer casing shall be fixed expeditiously, so as to avoid damage to the insulation from the weather.

22.11

The overlapping surface of outer casing/cladding sheet shall be coated with sealing compound, which will be supplied by BHEL free of cost.

22.12

To take care of bimetal corrosion due to variety of metals in contact of each other viz retainer to support, support to outer casing/cladding, cladding-to-cladding etc, suitable paints specified by BHEL, to be applied and/or neoprene rubber packing/strips or any other insert may have to be fixed as required.

22.13

The Contractor shall leave certain gaps and openings while doing the work as per the instructions of BHEL Engineer to facilitate inspection by boiler inspector or during commissioning to fix gauges, fittings, instruments etc. these gaps will have to be finished as per drawings at later date by the Contractor at his cost.

Contractor shall cut open works in needed as per BHEL Engineer's instructions during commissioning for inspection, checking and make good the works after inspection is over without any extra payment.

22.14

A log book shall be maintained by the Contractor for the clearance of the area for application of refractory and insulation. Where the Contractor does the work on his own accord without prior permission, the work should be re-done, at his own cost, where necessitated.

22.14

Wastage allowances for the material issued are envisaged as follows:

|     |                                |   |    |
|-----|--------------------------------|---|----|
| ➤ a | Pourable & castable insulation | - | 2% |
| ➤ b | Insulation bricks and mortar   | - | 2% |
| ➤ c | Wool mattresses                | - | 2% |
| ➤ d | Cladding sheets                | - | 2% |

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The wastage allowance will be applicable on the net issued quantity i.e. total quantity issued reduced by the quantity returned to stores as unused/fresh item. Contractor shall reconcile the material issues periodically as prescribed by BHEL site. Payment for the done will be regulated as per provision of **Chapters VII**.

22.15

The following works are also included in the scope of this contract.

Cutting of cladding sheets as per the profile of the equipment and painting on inner surface two coats of bituminous paint. Paint will be supplied by Contractor.

Cutting of the wool mattresses in the required shape and application of finishing cement of required thickness wherever required.

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#### 23 PAINTING

##### 23.1

All exposed metal parts of the equipment including piping, structures, railings etc. wherever applicable, after installation unless otherwise surface protected, shall be first painted with at least one coat of suitable primer which matches the shop primer paint used, after thoroughly cleaning all such parts of all dirt, rust, scales, greases, oils and other foreign materials by wire brushing, scraping or sand blasting, and the same being inspected and approved by BHEL engineer for painting. Afterwards, the above parts shall be finished with two coats of alloyed resin machinery enamel paints.

##### 23.2 Touch-up painting on damaged areas -

###### a) For coatings damaged up to metal surface

Surface preparation shall be carried out by manual cleaning. minimum 6 inches adjoining area with existing coating shall be roughened by wire brushing, emery paper rubbing etc., for best adhesion of patch primer.

Primer coat of touch-up primer to be applied by brush immediately after the surface preparation.

Over this primer coat, finish coat and final finish coat shall be applied as covered above by brush within maximum seven ( 7 ) days of application of touch up primer.

Tentative Painting scheme is enclosed for information at **Annexure-III**. However, for execution only the latest document shall be applicable and no claim whatsoever shall be entertained in case of any variance between such documents. Similarly, documents as provided progressively during the execution of work for all other products/ equipments etc shall be applicable.

##### 23.3

Painting of welded areas / painting of areas exposed after removal of temporary supports / touch-up painting on damaged areas of employer's structures, where inter-connection, welding / modification etc. has been carried out by the bidder.

- (a.) clean the surface to remove flux spatters and loose rust, loose coatings in the adjoining areas of weld seams by wire brush and emery paper.
- (b.) painting procedure to be followed as mentioned above for touch-up painting on damaged areas.

##### 23.4

The scope of work includes painting of colour bands, lettering, marking and signs for direction of flow/rotation, names etc of approved colours as per the standard colour codes and specifications specified in tender specification or as advised by BHEL/customer engineer at site



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for the equipments/ components covered in these specifications. Applicable paints and primer shall be supplied by BHEL.

#### 23.5

All exposed metal parts of the equipment including piping, structures, hand railing, grating etc shall be thoroughly cleaned off dust, rust, scales and other foreign materials by manual or mechanised wire brushing, scrapping, sand blasting etc and the same being inspected and approved by BHEL/customer engineer before application of primer. Afterwards, the above parts shall be finish painted with specified number of coats as per specification.

#### 23.6

In certain isolated instances where it is not possible to clean the equipments as explained above, cleaning by grinding might have to be resorted to. No damage to the equipment/components should be caused.

#### 23.7

Surface to be painted should be free of oil and grease. It should be removed by using suitable cleaning agents including permitted solvents. Surface cleaned by chemical agent, if required, shall be treated further as prescribed in use of such cleaning agents. The Contractor at his own cost shall provide all the consumables and application implements.

#### 23.8

During the preparation of surface, if the shop coat is damage by chemical cleaning or by mechanical means, Contractor shall repair the same free of cost to BHEL. BHEL will make available only the primer and paints free of any charge to Contractor.

#### 23.9

Specified drying time shall be permitted from one to another coat.

#### 23.10

This work requires working at higher altitudes from ground level to as high as 30 m and more. The work spread is also substantial involving substantial run of structures and piping. Contractor shall take sufficient precautions to avoid any accident and hazard in all respects. The ropes, ladders, scaffolding materials, clamps etc and climber used should be of standard quality for safe and smooth execution of work.

#### 23.11

Contractor shall carry out the work in such a way that other erected equipment, structure, civil foundations and other property are not damaged. For damages in any of such cases due to lapses by Contractor, BHEL shall have the right to recover the cost of such damages from the Contractor.

#### 23.12

Contractor shall take due care to cover/protect the equipment which are already painted while carrying out the painting of other adjacent equipment. If so happens, it shall be cleaned and repainted by the Contractor without any extra charges.

#### 23.13

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In general, painting of structural parts and colour bands, lettering, marking of direction of flow/rotation etc will be carried out by brush painting. However, areas/equipments inaccessible for manual painting have to be painted by spray painting. The decision of BHEL engineer, in this regard, shall be final and binding on the Contractor. For the purpose of spray painting, air at one point will be made available by BHEL free. Laying of air hose pipe and any other line required shall be done by Contractor at his cost. The Contractor shall provide spray equipment set.

#### 23.14

The Contractor shall provide all the necessary scaffolding materials, temporary structures and necessary safety devices etc, during execution of the work.

#### 23.15

Final painting work shall be started after obtaining clearance from BHEL engineers and as per his instructions.

#### **23.16 PRIMER AND PAINTS FOR FINAL PAINTING**

All primer and paints required for final painting shall be supplied by BHEL free of charges.

The Contractor, however, shall provide account of all the items issued to him and return all primer, paints etc remaining extra over the normal requirement with proper identification tags in a packed condition to BHEL stores. In case of any misuse or excess use over the normal requirement, BHEL reserves the right to recover the cost of such misuse/ excess use. Decision of BHEL Engineer in this regard will be final and binding on the Contractor.

#### **24.0 TESTING, PRE-COMMISSIONING, COMMISSIONING**

##### 24.1

Testing, pre-commissioning & commissioning will involve, though not limited to these, various testing, trial runs of various equipments erected and systems installed. All the activities for commissioning of the set, as informed by bhel from time to time shall be completed.

##### 24.2

All these tests should be repeated till all the equipments satisfy the requirement / obligations of BHEL to their client and also the relevant statutory authority.

##### 24.3

Contractor shall lay / install necessary temporary piping, pumps, valves, blanks, gauges, cables, switches etc for conduct of hydraulic / pressure test, chemical cleaning, steam / air blowing etc. this may involve cutting of some portion of existing piping / valves, placing of rubber wedges / blanks in the valves and other openings, fabrication and installation of temporary tanks for chemical mixing, temporary access platforms to mixing tanks etc. Where required, bends have to be fabricated / formed at site from random length / size of pipes / structural steel. Temporary installation itself has to be tested, tried, and subject to non-destructive examinations as per the instructions of BHEL as part of work.

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No payment will be made for temporary installations made for hydraulic testing of various systems & piping. Similarly no payment will be made for electrical installations made for any temporary system.

#### 24.4

All materials, equipments necessary for installation of temporary system as above will be supplied by BHEL as free returnable issue in random sizes / lengths. However, servicing, fabrication, erection, dismantling of the same after completion of the process, and handing over back to BHEL stores will be the responsibility of the Contractor.

In accounting of materials following wastage allowances are provided:

- |                     |   |    |
|---------------------|---|----|
| 1. Structural items | : | 5% |
| 2. Pipes            | : | 3% |

No wastage allowance for valves & other equipments.

#### 24.5

Overhauling, cleaning, servicing of tanks, pumps, equipments, valves, during erection and commissioning stages are in the scope of work. Gaskets, packing & spares for replacement will be provided free of charges by BHEL.

#### 24.6

During trial runs/ tests, pre-commissioning / commissioning, replacing / changing mechanical / other seals of equipments like pumps, removal and cleaning / replacing of filters etc is within the scope of work. Replacement spares for this purpose will be provided by BHEL.

#### 24.7

In case any defect is noticed during tests, trial runs of all equipments and their auxiliaries, such as interferences, rubbing, loose components, abnormal noise or vibration, strain on connected equipment etc the Contractor shall immediately attend to these defects and take necessary corrective measures. Readjustment and/or realignment, if necessary, shall be done as per BHEL engineer's instructions. Claim, if any, for these works shall be governed by relevant clauses of 'General Condition of Contract'

#### 24.8

- ✓ Contractor shall cut / open / dismantle work, if needed, as per BHEL Engineer's instructions during commissioning for inspection, checking and make good the works after inspection is over.
- ✓ Similarly, during the course of erection, if certain portion of equipments erected by the Contractor has to be undone for enabling other Contractors / agencies of BHEL / customer to carry out their work, Contractor shall carry out such jobs expeditiously and promptly and make good the job after completion of work by other Contractors / agencies of BHEL / customer as per BHEL engineer's / agencies of BHEL / customers instructions. Claims, if any, in this regard shall be governed as per relevant clauses of 'General Conditions of Contract'

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#### 24.9

During this period, though BHEL/ client's staff will also be associated in the work, the Contractor's responsibility will be to arrange for complete requirement of men and required tools and plants, consumables, scaffolding and approaches etc till such time the commissioned unit undergoes trial operations.

#### 24.10

Commissioning activities will continue till the completion of trial operation. During this period Contractor shall make available the services of separate dedicated workforce comprising of suitable skilled and semi-skilled / un-skilled workmen and supervisory staff alongwith necessary tools and plants, consumables etc.

#### 24.11

It shall be specifically noted that the Contractor may have to work round the clock during the pre-commissioning and commissioning period alongwith BHEL Engineers and hence considerable overtime payment is involved. The Contractor's quoted rates shall be inclusive of all these factors.

#### 24.12

The Contractor shall carry out any other tests as desired by BHEL engineer on erected equipment covered under the scope of this contract during testing, pre-commissioning and commissioning, to demonstrate the completion of any part or whole of work performed by the Contractor.

#### 24.13

At various stages of completion ESP has to be preserved against corrosion either by wet preservation or by dry preservation as per the requirement of BHEL Engineer. Contractor shall carry out the entire incidental jobs.

During this period, though BHEL/ client's staff will also be associated in the work, the Contractor's responsibility will be to arrange for complete requirement of men and required tools and plants, consumables, scaffolding and approaches etc., till such time the commissioned unit is taken over.

#### 24.14

Conducting of performance guarantee test is in the scope of work. Contractor shall install all necessary tapping points; instruments etc and provide necessary assistance in this regard.

In case PG test is getting delayed beyond the contract period (normal plus extension if any) due to reasons not attributable to the Contractor, PG test issue will be mutually discussed and decided. However installation of necessary tapping points, impulse pipes, approaches etc are to be completed by the Contractor.

#### 24.15

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The Contractor shall carry out any other tests as desired by BHEL engineer on erected equipment covered under the scope of this contract during testing, pre-commissioning and commissioning, to demonstrate the completion of any part or whole of work performed by the Contractor.

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#### **25.1 PRESERVATION & PROTECTION OF COMPONENTS**

At all stages of work, equipments/materials in the custody of Contractor, including those erected, will have to be preserved as per the instructions of BHEL. Necessary preservation agents including the primer & paint, for the above work shall be provided by the Contractor.

#### **25.2**

The Contractor shall make suitable security arrangements including employment of security personnel and ensure protection of all materials/ equipment in their custody and installed equipments from theft/fire/pilferage and any other damages and losses.

#### **25.3**

Contractor shall collect all scrap materials periodically from various area of work site, deposit the same at one place earmarked at site or shift the same to a place earmarked in BHEL/ client's stores. In case of failure of Contractor in compliance of this requirement, BHEL will make suitable arrangement at Contractor's risk and cost.

#### **25.4**

The entire surplus, damaged, unused materials, packaging materials / containers, special transporting frames, gunny bags, etc shall be returned to BHEL stores by the Contractor.

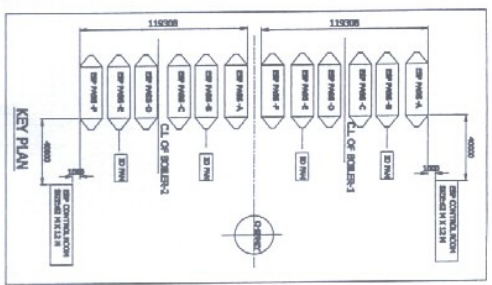
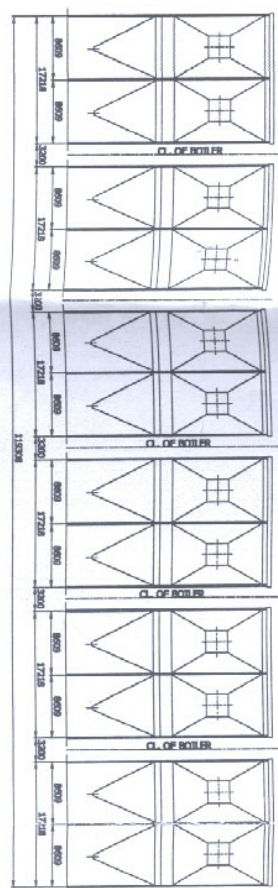
#### **25.5**

The Contractor shall not waste any materials issued to him. In case it is observed at any stage that the wastage/excess utilisation of materials is not within the permissible limits, recovery for the excess quantity used or wasted will be effected with departmental charges from the Contractor. Decision of BHEL on this will be final and binding on the Contractor.

#### **25.6**

For any class of work for which no specifications have been laid down in these specifications, work shall be executed as per the instructions of BHEL.





ALL DIMENSIONS ARE IN mm  
DIMENSIONS ARE SUBJECT TO ALTERATIONS

**NOTE:**

01. FOR BASE OFFER, THERE WILL BE 6 ESP PASSES PER BOILER AS PER TENDER AS SHOWN IN THIS DRAWING.
02. ESP CONTROL ROOM IS LOCATED AT 40 M DISTANCE FROM ESP OUTLET AS SHOWN IN THIS DRAWING. CABLE ESTIMATION FOR ESP IS CONSIDERED BASED ON THIS LOCATION.
03. THE PERFORMANCE TEST POCKET ADAPTERS WILL BE SUPPLIED IN ESP SCOPE WHICH ARE TO BE SUITABLY LOCATED IN THE STRAIGHT PORTIONS OF ESP INLET AND OUTLET DUCTS. THE REQUIRED APPROACH AND PLATFORM FOR THESE TEST POCKETS TO BE PROVIDED IN THE DUCTING SYSTEM BY BOILER VENDOR.
04. SIX OPACITY MONITORS PER BOILER WILL BE SUPPLIED IN ESP SCOPE WHICH ARE TO BE LOCATED IN THE COMMON OUTLET DUCT OF ESP (CONNECTING TWO OUTLET FLANGES). THE REQUIRED APPROACH AND PLATFORM ON BOTH SIDE OF DUCT TO BE PROVIDED IN THE DUCTING SYSTEM BY BOILER VENDOR.



INDICATES ESP TERMINAL POINTS AND BHEL SCOPE OF SUPPLY.

FOR TENDER PURPOSE

BASE OFFER

| REV | DATE | ALTERED |
|-----|------|---------|
|     |      | CHECKED |

CAUTION: The information on this document is the property of BHARAT HEAVY ELECTRICALS LTD. It must not be used directly or indirectly in any way detrimental to the interest of the company.

|   |                   |  |              |
|---|-------------------|--|--------------|
| NAME OF CUSTOMER/PROJECT  |                   | JAYPEE-NIGRIE 2X660 MW   |              |
|  |                   | BHARAT HEAVY ELECTRICALS LTD.,<br>UNIT. BOILER AUXILIARIES PLANT,<br>RAIPUR - 832 406. |              |
| DEPT. ACS   | GRADE OF UNIT/DIM |     | SCALE        |
| CODE 862  |                   | NIS  | WEIGHT (KG.) |
| TITLE   |                   | CARD CODE  |              |
| ESP GENERAL ARRANGEMENT DRAWING   |                   | u 01   |              |
| DRAWING NO.   |                   | 3-00-111-23541   |              |
| REV   |                   | NO. OF SHEETS  |              |
|   |                   | 1  |              |

700 / Ten / month