

TENDER NO. BHEL/NR/SCT/GGSRP-BATHINDA/GT,STG,BOPS&PIPING/623

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## TENDER SPECIFICATION

TENDER NO. BHEL/NR/SCT/GGSRP-BATHINDA/GT,STG,BOPs&PIPING/623

FOR

Erection, testing, commissioning and trial operation of and handing over of 2X36 MW STG (Db Ext), 1X32 MW STG (Bk Pr) with auxiliaries, 2XFr-6 GT/ GTG with auxiliaries, all Related Pumps and Piping for 153 MW, CPP of Guru Gobind Singh Refineries Project, Bathinda of HPCL Mittal Energy Ltd

### PART I – TECHNICAL BID



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

TENDER NO. BHEL/NR/SCT/GGSRP-BATHINDA/GT,STG,BOPS&PIPING/623



ISO 9001-2000, ISO 14001 and  
OHSAS 18001 certified company  
SubContract and Purchase Deptt.

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**Bharat Heavy Electricals Limited**

(A Govt. Of India Undertaking)

Power Sector – Northern Region,

Plot No. 25, Sector - 16A ,

Distt. Gautam Budh Nagar, NOIDA – 201 301.INDIA

Phone: 0120-2515476/ 2416407/ 2515479

Fax: 0120-2515464/ 2515467

Email: sku@bhelnsnr.co.in/ rb@bhelnsnr.co.in

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### IMPORTANT NOTE

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

THIS TENDER SPECIFICATION ISSUED TO:

M/s-----

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## TENDER NOTICE

Sealed tenders are invited from the contractors fulfilling qualifying requirements for the “Erection, testing, commissioning and trial operation of and handing over of 2X36 MW STG (Db Ext), 1X32 MW STG (Bk Pr) with auxiliaries, 2XFr-6 GT/ GTG with auxiliaries, all Related Pumps and Piping for 153 MW, CPP of Guru Gobind Singh Refineries Project, Bathinda of HPCL Mittal Energy Ltd.”

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### QUALIFYING REQUIREMENTS:

- 1.1 “Tenderers who wish to participate should have carried out similar nature works for at least one Frame-6 GT/ GTG set or higher rating set, during last seven years
- OR
- 1.2 executed similar nature of works, covered in this tender, for at least one STG Set of 30 MW Unit or higher rating STG during last seven years
- AND
- 2.0 should have an average annual financial turnover of minimum of Rupees 4.2 Crore during last three years (2005-06, 06-07 and 07-08). The tenderer shall submit audited balance sheet in support of the same”.
- AND
- 3.0 Bidder selection is subject to approval of BHEL customer for this work i.e. M/s HPCL MITTAL ENERGY LTD.”

### NOTES:

- (i) The Tender Documents comprise of following:
- (a) General Conditions of Contract, Special Conditions of Contract, Tender Notice, Project Synopsis etc.
  - (b) Scope of work, Standard Specifications, P&ID drawings and HSE Documents
  - (c) Price Bid
- (ii) Tender Documents with complete details are hosted in this web page. Bidder(s) intending to participate may download the tender document from the web site. Bidder(s) downloading the tender documents from the web site, shall remit Rs. 1,000/- (Rupees One Thousand Only) in the form of crossed demand draft (non-refundable), in favour of BHEL, NOIDA along with their offer

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- (iii) Bidder(s) can also purchase hard copy of tender documents from this office. Tender documents (non transferable) will be issued on all working days between 09.30 Hrs. to 12.30 Hrs within the sale period i.e. **upto 05.05.2009** on payment of Rs. 1,000/- (non-refundable) either in cash or by crossed demand draft in favour of BHEL, Noida. Request for issue of tender document should clearly indicate Tender No. and work.
- (iv) Tenders must be submitted to the undersigned or to his nominee in Room no. 104, BHEL, PSNR, Noida, **latest by 05.05.2009** before opening of technical bids commences. Technical bids shall **be opened at 15.30 Hrs. on 05.05.2009**.
- (v) Earnest Money Deposit (EMD): Refundable, Non-interest bearing **EMD of Rs. 2,00,000/-** shall be deposited by Account Payee Pay Order 'OR' Demand Draft in favour of "Bharat Heavy Electricals Limited" payable at Delhi/ NOIDA. Those bidders who have already deposited 'One Time EMD' of Rs. 2,00,000/- with BHEL, PSNR, NOIDA need not submit EMD with the present tender.
- (vi) BHEL reserves the right to go for a Reverse Auction instead of opening the submitted sealed bid, which will be decided after technical evaluation. As such, the bidders should submit their best prices in the 'Sealed Price Bid'. However, bidders are required to confirm their acceptance of "General terms and conditions" governing RA specifically in their technical bid. The "General terms and conditions" governing RA are given in the SCC of the NIT. Bidders are also required to furnish following details in their techno-commercial bid, for this purpose (RA).

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

- a) Name and Designation of official
  - b) Postal Address
  - c) Telephone Nos. (Land line & Mobile both)
  - d) FAX No.
  - e) E-mail address
  - f) Name of Place/ State/ Country, wherefrom he will participate in the RA
- (vii) Tenders not accompanied with Full Earnest Money Deposit, as indicated above, will not be considered.
  - (viii) All corrigenda, addenda, amendments and clarifications to this Tender will be hosted in this web page and not in the newspaper. Bidders shall keep themselves updated with all such amendments.
  - (ix) BHEL reserves the right to accept or reject any or all tenders without assigning any reason whatsoever.
  - (x) BHEL takes no responsibility for any delay/ loss of documents or correspondences sent by courier/ post.
  - (xi) Purchase Preference will be given to CPSUs as per Govt. Guidelines.

**DGM/ SCP**

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**DOMESTIC NOTICE INVITING TENDER**

LAST DATE OF SALE : 05.05.2009  
DATE OF OPENING : 05.05.2009

**NIT NO./ NAME OF WORK**

**TENDER NO. BHEL/NR/SCT/GGSRP-BATHINDA/GT,STG,BOPS&PIPING/623**

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**NOTES:**

1. Purchase Preference will be given to CPSU as per Govt. Guidelines.
2. Please visit our website at [www.bhel.com](http://www.bhel.com) for details of NIT including Qualifying Requirements.

**DGM/ SCP**

**PROJECT SYNOPSIS**

**153 MW Guru Gobind Singh Refineries Project (CPP), Bathinda of HPCL Mittal Energy Ltd**

M/s HPCL - MITTAL Energy Ltd. (HMEL) - Guru Gobind Singh Refineries Project, Bathinda, Punjab has entrusted BHEL to install CCP to meet the Steam & Power requirement of the refinery project of 153 MW – CCPP, comprising of 4X240 TPH UTILITY BOILERS, 2X110 TPH HRSG WITH SF 2X34.5 MW STG (Db Ext), 1X35 MW STG (Bk Pr), 2XFR-6 GTG & BOP's.

The plant is to be engineered, supplied, erected and commissioned on EPC basis by BHEL.

The site is located on NH 64 near Village Gurthui (Bhatinda-Dabwali section), 2 Km away from town of Raman Mandi and 30 Km from Bathinda. Tattangarh (Kanakwall) is the nearest Railway station located about 3 Km from the project. Bhisiana, Bathinda is the nearest Airport, located about 30Km away.

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**PROCEDURE FOR SUBMISSION OF SEALED TENDERS:**

The tenderers must submit their tenders as required in **two parts** in separate sealed covers **prominently superscribed as Part-I Technical bid and Part-II, Price bid** also indicating on each of the cover tender specification no., date and time as mentioned in tender notice.

**TECHNICAL BID (COVER-I)**

Except **Price bid Part-II**, complete set of tender document consisting of General conditions of Contract, "Technical specification & Special terms and condition" (Part-I) issued by BHEL shall be enclosed in **Part I Technical Bid only**. All schedules, data sheets and details called for in the specification shall also be submitted along with technical bid. All details/ Data/ Schedules including offer letter duly signed and stamped are to be **submitted in duplicate**.

**PRICE BID (COVER-II)**

Tenderers may please note that price bid is **to be submitted only in original copy** of Tender i.e. Price bid (Part-II) issued by BHEL and no duplicate copy of same is required.

These Two separate covers i.e. cover I & II shall together be enclosed in a **third envelope (Cover-III)** and this sealed cover shall be superscribed with tender specification No., due date, time and submitted to officer inviting tender as indicated in tender notice on or before due date as indicated.

## SECTION- I

### GENERAL INSTRUCTIONS TO TENDERERS

- 1 This tender specification as a whole, furnishing all the details and other documents as required in the following pages, shall be duly signed and sent in a sealed cover (IN DUPLICATE) super-scribing the name of work as given in the tender notice.
- 2 The tender shall be addressed to: OFFICER INVITING TENDER AS INDICATED IN THE TENDER NOTICE.
3. Tenders submitted by post shall be sent as "**REGISTERED/ SPEED/ COURIER POST** " and shall be posted with due allowance for any postal delay. The tenders received after the due date and time of opening is liable to be rejected. Offers received by Telegram/ telex/ Fax/ E-mail/ Internet may be considered as per terms of NIT.
- 4 Tenders shall be opened at the time and date as specified in the tender notice in the presence of such of those tenderers or their authorised representatives who may be present.
- 5 The tenderers shall closely peruse all the clauses, specifications and drawings indicated in the Tender Documents before quoting. Should the tenderer have any doubt about the meaning of any portion of the Tender Specifications or find discrepancies/ omission in the Drawings or the tender documents issued are incomplete or shall require clarification on any of the technical aspect, scope of work etc., he shall at once contact the authority inviting the tender for clarification before the submission of the tender.
- 6 Before tendering, the tenderers are advised to inspect the site of work and the environments and be acquainted with the actual working and other prevalent conditions, facilities available, position of material and labour. No claim will be entertained later on grounds of lack of knowledge.
- 7 Tenderer must fill up all the schedules and furnish all the required information as per the instructions given in various sections of the tender specification. Each and every page of the Tender Specification must be SIGNED, STAMPED AND SUBMITTED ALONG WITH THE OFFER by the Tenderer in token of complete acceptance thereof. The information furnished shall be complete by itself.
- 8 The tenderer shall quote the rates in English Language and international numerals. These rates shall be entered in figures as well as in words. In case of difference in rates between words and figures THE LESSER OF THE TWO will be treated as valid rate. For the purpose of tender, the metric system of units shall be used.
- 9 All entries in the tender shall either be typed or be written in ink. Erasure and over writings are not permitted and may render such tenders liable to summary rejection. All cancellations and insertions shall be duly attested by the tenderer.

- 10 **QUALIFICATIONS OF TENDERERS:** Only tenderers who have previous experience in the work of this nature and description detailed in this tender specification are expected to quote for this work. Offers from tenderers who do not have proven and established experience in the field are not likely to be considered.
- 11 **DATA TO BE ENCLOSED:** Full information shall be given by the tenderer in respect of the following. Non-submission of this information may lead to rejection of the offer.
- 11.1 **FINANCIAL STATUS:** Financial viability as per proforma enclosed at *ANNEXURE-`A`*
- 11.2 **INCOME TAX CERTIFICATES:** A Certificate of Income tax clearance from the appropriate authority in the forms prescribed thereof duly indicating annual turnover. These certificates shall be valid for one year from the date of issue or for the period prescribed therein for all tenders submitted during the period.
- 11.3 **PREVIOUS EXPERIENCE:** A statement giving particulars (duly supported by documentary evidence) of the various service rendered in progress for each similar works by the tenderer indicating the particulars and value of each work, the site location, the duration, date of completion etc., strictly as per proforma enclosed at *ANNEXURE-`B`*.
- 11.4 **ORGANISATION CHART:** The organisation pattern that are totally available with him and that will be employed by the tenderer for this work in the form of monthwise and categorywise deployment plan duly indicating the number of Engineers, Supervisors, skilled and unskilled workers etc., as per proforma enclosed at *ANNEXURE-`C`*.
- 11.5 An attested copy of the **Power of Attorney**, in case the tender is signed by an individual other than the sole Proprietor, shall also be attached.
- 11.6 **IN CASE OF AN INDIVIDUAL:** His full name, experience, address and nature of business.

OR

**IN CASE OF PARTNERSHIP FIRMS:** The names of all the partners with addresses and their experience. A copy of the partnership deed/ instrument of Partnership duly certified by a Notary Public shall be enclosed.

OR

**IN CASE OF COMPANIES:** Date and place of registration including date of commencement certificate in case of public companies and the nature of business carried or by the Company. Certified copies of memorandum and Articles of Association are also to be furnished. Also indicate names, addresses and experience of the Directors.

- 11.7 A list of tools and tackles (including cranes, tractor-trailers, winches, Derricks, welding sets etc., wherever applicable) that the tenderer is having and those that will be deployed on this job as per proforma enclosed at *ANNEXURE-`D`*.

- 11.8** Analysis of unit rate quoted as per proforma enclosed at **ANNEXURE-`E'**.
- 11.9 Declaration sheet as per proforma enclosed at **ANNEXURE-`F'**.
- 11.10 In addition to the above, the particulars required elsewhere in tender documents.
- 11.11 Checklist and schedule of general particulars duly filled in, signed and stamped as per **ANNEXURE-`G'**.

NOTE: In terms of clauses 11.1 to 11.11 above, all the data required to be enclosed with the tender need to be furnished neatly typed, signed and stamped in the given formats only (in the form of separate sheets) failing which the tender may be considered as incomplete and is liable for rejection. Documentary proofs wherever necessary also need to be enclosed.

- 12 EARNEST MONEY DEPOSIT:** Every tender must be accompanied by the prescribed amount of Earnest Money Deposit in any one of the following forms.

NOTE: Bank Guarantee, Cheques, Currency Notes, Money Orders or Postal Orders will not be accepted.

- 12.1 **Cash (As permissible under Income Tax Act):** The amount should be remitted by the party to the Cashier of Bharat Heavy Electricals Limited and cash receipt issued by him shall be enclosed alongwith the tender.
- 12.2 Pay Order or Demand Draft in favour of Bharat Heavy Electricals Limited, Noida.
- 12.3 Tenders received without Earnest Money in full in the manner prescribed above will not be considered.
- 12.4 The Earnest Money Deposit of the successful tenderer will be retained towards part of Security Deposit.
- 12.5 In the case of unsuccessful tenderers, the Earnest Money will be refunded normally within fifteen days of acceptance of award of work by the successful tenderer.
- 12.6 BHEL reserves the right of **forfeiture of Earnest Money deposit** in case the successful tenderer,
- (a). After opening of Tender, revokes his tender within the validity period or increases his earlier quoted rates.
  - (b) Does not commence the work within the period as per LOI/ Contract. In case the LOI/ Contract is silent in this regard then within 15 days after award of contract.
- 12.7 EMD shall not carry any interest.

- 12.8 Tenderers, who so ever desires, may deposit one time Earnest Money Deposit of Rs. 2,00,000/- in cash (*As permissible under Income Tax Act*)/ DD/ pay order only with the cashier of BHEL. Tenderers, who furnish one time EMD as above, will not be required to furnish EMD time and again alongwith their tenders submitted to BHEL/ PSNR. However they will be required to indicate the cash receipt No. and date of one time EMD in all their tenders.
- 13 **AUTHORISATION AND ATTESTATION:** Tenders shall be signed by persons duly authorised/ empowered to do so. Certified copies of such authority and relevant documents shall be submitted alongwith the tenders.
- 14 **VALIDITY OF OFFER:** *THE OFFER SHALL BE KEPT OPEN FOR ACCEPTANCE FOR A MINIMUM PERIOD OF SIX MONTHS FROM THE DATE OF OPENING OF TENDERS.* In case Bharat Heavy Electricals Limited calls for negotiations, such negotiations shall not amount to cancellation or withdrawal of the original offer which shall be binding on the tenderers.
- 15 **EXECUTION OF CONTRACT:** The successful tenderer's responsibility under this contract commences from the date of issue of the Letter of Intent by Bharat Heavy Electricals Limited. The successful tenderer shall be required to execute an agreement in the prescribed form as per *ANNEXURE-'I'* with the BHEL within a reasonable time after the acceptance of his tender and in any case before submitting the first bill for payment.
- 16 **SECURITY DEPOSIT:** Upon acceptance of tender, the successful tenderer must deposit the required amount of security deposit within the time specified in the Letter of Intent for satisfactory completion of work.
- 16.1 The total amount of Security Deposit shall be as follows:
- (a) In case of work costing upto 10 lakhs: 10% of the contract value.
  - (b) In case of work costing above Rs 10 lakhs and upto Rs 50 lakhs: 1 Lakh + 7.5 % of the amount exceeding Rs. 10 Lakhs.
  - (c) In case of work costing more than Rs 50 lakhs: 4 Lakhs + 5 % of the amount exceeding Rs. 50 Lakhs.
- 16.2 The Security Deposit will be deposited within 15 days from the date of issue of Letter of Intent but before start of work in any one of the following forms:-
- (a) The total Security Deposit as indicated in the Letter of Intent in **cash** (As permissible under Income Tax Act).
  - (b) Pay Order, Demand Draft in favour of BHEL.
  - (c) Local cheques of scheduled banks, subject to realization.

- (d) Securities available from Post Offices such as National Savings Certificates, Kisan Vikas Patras etc.  
  
(Certificates should be held in the name of Contractor furnishing the security and duly pledged in favour of BHEL and discharged on the back).
- (e) Bank Guarantee from Scheduled Banks/ Public Financial Institutions as defined in the Companies Act. The Bank Guarantee format should have the approval of BHEL.
- (f) Fixed Deposit Receipt issued by Scheduled Banks/ Public Financial Institutions as defined in the Companies Act. The FDR should be in the name of the contractor, A/C BHEL, duly discharged on the back.
- (g) Security deposit can also be recovered at the rate of 10% from the running bills. However in such cases at least 50% of the Security Deposit should be collected before start of the work and the balance 50% may be recovered from the running bills.
- (h) EMD of the successful tenderer shall be converted and adjusted against the security deposit.

16.3 The security deposit shall not carry any interest.

**NOTE:** Acceptance of Security Deposit against Sl. No. (d) and (f) above will be subject to hypothecation or endorsement on the documents in favour of BHEL. However, BHEL will not be liable or responsible in any manner for the collection of interest or renewal of the documents or in any other matter connected therewith.

16.4 Security deposit shall not be refunded to the contractor except in accordance with the terms of the contract.

16.5 The validity of the Bank Guarantee furnished towards Security Deposit under (e) above shall be upto the period of completion of work as stipulated in the Letter of Intent + 1 month and the same will be kept valid by proper renewal till the satisfactory completion of the Guarantee Period.

16.6 If the value of the work done at any time exceeds the accepted agreement value, the Security Deposit shall be correspondingly enhanced and the extra Security Deposit shall be immediately deposited by the Contractor or recovered from payments due to him.

16.7 Failure to deposit the Security Deposit within the stipulated time, may lead to forfeiture of Earnest Money Deposit and Cancellation of the award of work.

16.8 If any part of Security Deposit of the Contractor is held in the form of approved securities, it shall be kept transferred in the name of Bharat Heavy Electricals Limited, in such a manner

that the same can be realised fully without referring to the Contractor. BHEL shall not be responsible for any depreciation in the value of the Security while in BHEL's custody or for any loss of interest thereon.

- 16.9 BHEL reserves the right of *forfeiture of Security Deposit* in addition to other claims and penalties in the event of the contractor's failure to fulfil any of the contractual obligations or in the event of termination of contract as per terms and conditions of contract. BHEL reserves the right to set off the Security Deposit, against any claims of any other contracts with BHEL.
- 16.10 **RETURN OF SECURITY DEPOSIT:** If the contractor fully performs and completes the work in all respects to the entire satisfaction of BHEL and presents an absolute "*No Demand Certificate*" in the prescribed form and returns properties belonging to BHEL taken, borrowed or hired by him for carrying out the said works, half the amount of Security Deposit will be released to the contractor after deducting all costs, expenses and other amounts that are to be paid to BHEL under this or other contracts entered into with the Contractor. It may be noted that in no case the Security Deposit shall be refunded/ released prior to passing of final bill. Balance half of the amount of Security Deposit will be released only after the Guarantee Period is over.

**NOTE: All the BGs are to be submitted as per BHEL/ PSNR proforma.**

- 17 **No interest** shall be payable by BHEL on Earnest Money Deposit, Security Deposit or on any moneys due to the contractor.
- 18 **REJECTION OF TENDER AND OTHER CONDITIONS:**
- 18.1 The acceptance of Tender will rest with BHEL which does not bind itself to accept the lowest tender or any tender and reserves to itself full rights for the following without assigning any reasons whatsoever.
- (a) To reject any or all of the tenders.
  - (b) To split up the work amongst two or more Tenderers.
  - (c) To award the work in part.
  - (d) In either of the contingencies stated in (b) and (c) above to modify the time for completion suitably.
- 18.2 Conditional and un-witnessed tenders, tenders containing absurd or unworkable rates and amounts, tenders which are incomplete or otherwise considered defective and tenders not in accordance with the tender conditions, specifications, etc., are liable to be rejected.
- 18.3 If a tenderer expires after the submission of his tender or after the acceptance of his tender, BHEL may at its discretion, cancel such tender. If a partner of a firm expires after the

- submission of the tender or after the acceptance of the tender, BHEL may cancel such tender at its discretion unless the firm retains its character.
- 18.4 BHEL will not be bound by any Power of Attorney granted by the tenderer or by changes in the composition of the firm made subsequent to the execution of the contract. BHEL may, however, recognise such Power of Attorney and changes after obtaining proper legal advice, the cost of which will be chargeable to the contractor concerned.
  - 18.5 If the tenderer deliberately gives wrong information in his tender, BHEL reserves the right to reject such tender at any stage or to cancel the contract, if awarded and forfeit the Earnest Money/ Security Deposit/ any other moneys due.
  - 18.6 Canvassing in any form in connection with the tender is strictly prohibited and the tenders submitted by the contractor who resorts to canvassing are liable to be rejected.
  - 18.7 Should a tenderer or contractor or in the case of a firm or Company of contractors/ one or more of its Partners/ share holders/ Directors have a relation or relations employed in BHEL, the authority inviting tender shall be informed to the fact alongwith the offer, failing this BHEL may, at its sole discretion reject the tender or cancel the contract and forfeit the Earnest Money/ Security Deposit.
  - 18.8 The successful tender should not sub-contract the part or complete work detailed in the tender specification without written permission of BHEL. The tenderer is solely responsible to BHEL for the work awarded to him.
  - 18.9 **NO DEVIATIONS** to the tender conditions will normally be accepted. However, if the tenderer insists for certain deviations to the conditions, financial implication thereof shall be loaded to the quoted price for evaluating the tenderer's offer.

## SECTION - II

### GENERAL TERMS AND CONDITIONS

- 19.0 The following terms and expressions shall have the meaning hereby assigned to them except where the context otherwise requires.
- 19.1 **BHEL** (or B.H.E.Ltd.) shall mean Bharat Heavy Electricals Limited, a Company registered under the Indian Companies Act, 1956, with its Registered Office at BHEL HOUSE, SIRI FORT, NEW DELHI-110049 or its authorised officers or its Engineer or other employees authorised to deal with any matters with which these persons are concerned, on its behalf.
- 19.2 **`GENERAL MANAGER'** shall mean the Officer in Administrative charge of the contracting Unit of BHEL.
- 19.3 **`ENGINEER' or `ENGINEER-IN-CHARGE'** shall mean Engineer deputed by BHEL. The terms include Deputy General Manager, Construction Manager, Resident Manager, Site Engineer, Resident Engineer and Assistant Site Engineer of BHEL at the site as well as the officers in charge at Head Office.
- 19.4 **`SITE'** shall mean the place or places at which the plants/ equipment are to be erected and services are to be performed as per the specifications of this Tender.
- 19.5 **`CLIENTS OF BHEL' or `CUSTOMER'** shall mean the project authorities to whom BHEL is supplying the equipment.
- 19.6 **`CONTRACTOR'** shall mean the individual, firm or company who enters into contract with BHEL and shall include their executors, administrators, successors and permitted assigns.
- 19.7 **`CONTRACT' or `CONTRACT DOCUMENT'** shall mean and include the agreement, the work order, the accepted appendices of rates, Schedules of Quantities, if any, General Conditions of Contract, Special Conditions of Contract, Instructions to Tenderers, the drawings, the technical specifications, the special specifications, if any, the tender documents and the Letter of Intent/ Acceptance letter issued by BHEL. Any conditions or terms stipulated by the tenderer in the tender documents or subsequent letters shall not form part of the Contract unless specifically accepted in writing by BHEL in the Letter of Intent and incorporated in the Agreement.
- 19.8 **`GENERAL CONDITIONS OF CONTRACT'** shall mean the `Instructions to Tenderers' and `General Conditions of Contract' pertaining to the work detailed.
- 19.9 **`TENDER SPECIFICATIONS'** shall mean the Special Conditions, Technical Specifications, appendices, Site information and drawings pertaining to the work for which the tenderers are required to submit their offer. Individual Specifications Number will be assigned to each tender specification.

- 19.10 **'TENDER DOCUMENTS'** shall mean the General Conditions of Contract (19.8) and Tender Specifications (19.9).
- 19.11 **'LETTER OF INTENT'** shall mean the intimation by a letter/ telegram/ telex/ fax to the tenderer that the tender has been accepted in accordance with provisions contained in the letter. The responsibility of the contractor commences from the date of issue of this letter and all the terms and conditions of contract are applicable from this date.
- 19.12 **'COMPLETION TIME'** shall mean the period by date specified in the Letter of Intent or date mutually agreed upon for handing over the erected equipment/ plant which are found acceptable by the Engineer being of required standard and conforming to the specifications of the Contract.
- 19.13 **'PLANT'** shall mean and connote the entire assembly of the plant and equipment covered by the Contract.
- 19.14 **'EQUIPMENT'** shall mean all equipment, machineries, materials, structurals, electricals and other components of the plant covered by the Contract.
- 19.15 **'TESTS'** shall mean and include such test or tests to be carried out by the contractor as are prescribed in the Contract or considered necessary by BHEL in order to ascertain the quality, workmanship, performance and efficiency of the contracted work or part thereof.
- 19.16 **'APPROVED', 'DIRECTED' or 'INSTRUCTED'** shall mean approved, directed or instructed by BHEL.
- 19.17 **'WORK' or 'CONTRACT WORK'** shall mean and include supply of all categories of labour, specified consumables, tools and tackles required for complete and satisfactory site transportation, handling, stacking, storing, erecting, testing and commissioning of the equipment to the entire satisfaction of BHEL.
- 19.18 **'SINGULAR' and 'PLURAL'** etc. words carrying singular number shall also include plural and vice versa where the context so requires. Words importing masculine gender shall be taken to include the feminine gender and words importing persons shall include any Company or Association or Body of Individuals, whether incorporated or not.
- 19.19 **'HEADINGS'** The headings in these General Conditions are solely for the purpose of facilitating reference and shall not be deemed to be part thereof or be taken into consideration in the interpretation or construction thereof or the contract.
- 19.20 **'MONTH'** shall mean calendar month.
- 19.21 **'WRITING'** shall include any manuscript, type written or printed statement under the signature or seal as the case may be.

- 20 **LAW GOVERNING THE CONTRACT AND COURT JURISDICTION:** The Contract shall be governed by the Law for the time being in force in the Republic of India. The Civil Court at Delhi/ New Delhi, having ordinary Original Civil Jurisdiction shall alone have exclusive jurisdiction in regard to all claims in respect of this Contract.
- 21 **ISSUE OF NOTICE:** The Contractor shall furnish to the Engineer, the name, designation and address of his authorised agent and all complaints, notices, communications and references shall be deemed to have been duly given to the Contractor, if delivered to the Contractor or his authorised agent or left at or posted to the address either of the contractor or his authorised agent and shall be deemed to have been so given in the case of posting on the day on which they would have reached such address in the ordinary course of post or at which they were so delivered or left.
- 22 **USE OF LAND:** No land belonging to BHEL or its customer under temporary possession of BHEL shall be occupied by the Contractor without the written permission of BHEL.
- 23 **COMMENCEMENT AND COMPLETION OF WORK**
- 23.1 The contractor shall commence the work within the time indicated in the Letter of Intent and shall proceed with the same with due expedition without delay.
- 23.2 If the successful tenderer fails to commence the work within the stipulated time, BHEL, at its sole discretion, will have the right to cancel the contract. His Earnest Money and/ or Security Deposit will stand forfeited without any further reference to him without prejudice to any and all of BHEL's other rights and remedies in this regard.
- 23.3 All the works shall be carried out under the direction and to the satisfaction of BHEL.
- 23.4 The transported equipment, erected/ constructed plant or work performed under the Contract, as the case may be, shall be taken over when it has been completed in all respects and/ or satisfactorily put into operation at site.
- 24 **MEASUREMENT OF WORK AND MODE OF PAYMENT**
- 24.1 All payments due to the contractor shall be made by 'Account Payee' Cheques.
- 24.2 For progress/ running bill payments, the contractor shall present detailed measurement sheets in triplicate duly indicating all relevant details based on technical documents and connected drawings for the work done during the month/ period under different categories in line with terms of payment as per Letter of Intent. The basis of arriving at the quantities/ weights shall be the relevant documents and drawings released by BHEL. These measurement sheets shall be prepared jointly with Engineer and signed by both the parties.
- 24.3 These measurement sheets will be checked by the Engineer and quantities and percentages eligible for payment under different groups shall be decided by him. The abstract of

- quantities and percentages so arrived at based on the terms of payment shall be entered in the **Measurement Book and signed by both the parties.**
- 24.4 Based on the above quantities, contractor shall prepare the bills in the prescribed proforma and work out the financial value. These will be entered in the Measurement Book and signed by both the parties. Payment shall be made by BHEL after affecting the recoveries due from the contractor.
- 24.5 All recoveries due from the contractor for the month/ period shall be affected in full from corresponding running bills unless specific approval from Competent authority is obtained to the contrary.
- 24.6 Measurement shall be restricted to that quantity for which it is required to ascertain the financial liability of BHEL under this contract.
- 24.7 Measurement shall be taken jointly by persons duly authorised by BHEL and the Contractor.
- 24.8 The Contractor shall bear the expenditure involved, if any, in making the measurements and testing of materials to be used/ used in the work. The Contractor shall, without extra cost to BHEL, provide all the assistance with appliances and other things necessary for measurement.
- 24.9 If, at any time due to any reason whatsoever, it becomes necessary to re-measure the work done, in full or in part, the expenses towards such re-measurement shall be borne by the Contractor.
- 24.10 *Passing of bills covered by such measurements does not amount to acceptance by BHEL of the completion of the work measured. Any left out work has to be completed by the Contractor, as directed.*
- 24.11 Final measurement bill shall be prepared in the proforma prescribed for the purpose, based on the certificate issued by the Engineer that the entire work as stipulated in the tender specifications has been completed in all respects to the entire satisfaction of BHEL. The Contractor shall give unqualified 'No Claim' and 'No Demand' certificates. All the tools and tackles loaned to him should be returned in condition satisfactory to BHEL. The abstract of final quantities and financial values shall also be entered in the Measurement Book and signed by both the parties. The final bill shall be paid within a reasonable time after completion of the work. After the payment of final bill, only the guarantee obligation percentage value shall remain unpaid which shall be released in accordance with clause 32.

## **25 RIGHTS OF BHEL**

**BHEL** reserves to itself the following rights in respect of this contract without entitling the contractor to any compensation.

- 25.1 To get the work done through another agency at the risk and cost of the contractor, in the event of poor progress or the contractor's inability to progress the work for completion as stipulated in the contract, poor quality of work, persistent disregard of instructions of BHEL, assignment, transfer, subletting of the contracted work without written permission of BHEL, non-fulfillment of any contractual obligations etc. and to claim/ recover compensation for such losses from the contractor including BHEL's supervision charges and overheads from Security Deposit/ other dues.
- 25.2 To withdraw any portion of work and/ or to restrict/ alter quantum of work as indicated in the contract during the progress of work and get it done through another agency and/ or by the departmental labour to suit BHEL's commitments to its customer or in case BHEL decides to advance the completion due to other emergent reasons/ BHEL's obligation to its customer.
- 25.3 To terminate the contract after due notice and forfeit the Security Deposit and recover the loss sustained in getting the balance work done through other agencies in addition to liquidated damages in the event of:
- (a) Contractor's continued poor progress.
  - (b) Withdrawal from or abandonment of the work before completion of the work.
  - (c) Corrupt act of the contractor.
  - (d) Insolvency of the contractor.
  - (e) Persistent disregard of the instructions of BHEL.
  - (f) Assignment, transfer, subletting of the contract work without BHEL's written permission.
  - (g) Non-fulfillment of any contractual obligations.
- 25.4 To recover any moneys due from the Contractor from out of any moneys due to the Contractor under this or any other Contract or from the Security Deposit.
- 25.5 To claim compensation for losses sustained including BHEL's supervision charges and overheads in case of termination of contract and to levy liquidated damages for delay in completion of work, at the rate of 1/2% of the contract value per week of delay or part thereof subject to a ceiling **of 10% of the contract value.**
- 25.6 To determine the Contract or to restrict the quantum of work and pay for the portion of work done in case BHEL's contract with its customer is terminated for any reason.

- 25.7 To affect recoveries from any amounts due to the contractor under this or any other contract or in any other form the moneys which BHEL is forced to pay to any body due to contractor's failure to fulfil any of his obligations.
- 25.8 To restrict or increase the quantity and nature of work to suit site requirements, since the tender specification is based on preliminary documents and quantities furnished therein are indicative and approximate and the rates quoted shall not be subject to revision.
- 25.9 To deploy BHEL's skilled and semiskilled workmen in case of emergency/ poor progress/ deficiency in skill on the part of the employees of the contractor and to recover the expenditure on account of the same from the moneys due to the contractor.
- 25.10 While every endeavor will be made by BHEL to this end, BHEL cannot guarantee uninterrupted work due to conditions beyond its control. The Contractor will not be entitled to any compensation/ extra payment on this account.
- 25.11 In the event of any dispute of technical nature, the decision of BHEL shall be final and binding on the Contractor.

**26 RESPONSIBILITIES OF CONTRACTOR IN RESPECT OF LOCAL LAWS, EMPLOYMENT OF WORKERS, ETC.**

The following are the responsibilities of the Contractor in respect of observance of local laws, employment of personnel, payment of taxes etc.:

- 26.1 As far as possible, unskilled workers shall be engaged from the local areas in which the work is being executed.
- 26.2 The contractor at all times, during the continuance of this contract, shall in all his dealings with the local labour for the time being employed on or in connection with the work, have due regard to all local festivals, religious and other customs.
- 26.3 The Contractor shall comply with all State and Central Laws, Statutory Rules, Regulations, etc., such as The payment of wages Act, The Minimum Wages Act, The workmen's Compensation Act, The Employer's Liability Act, The industrial Disputes Act, The Employees' Provident Fund Act, Employees' State Insurance Scheme, the Contract Labour (Regulations and Abolition Act, 1970) and other Acts, Rules and Regulations for labour as may be enacted by the Government during the tenure of the Contract and having force or jurisdiction at site. The contractor shall give to the local Governing Body, Police and other concerned Authorities all such notice as may be required under law.
- 26.4 The Contractor, in the event of his engaging 20 or more workmen, will obtain independent license under the Contract Labour (Regulations and Abolition Act, 1970) from the concerned authorities based on the certificate (Form-V) issued by the principal employer/ customer.

- 26.5 The contractor shall pay all taxes, fees, license charges, deposits, duties, tolls, royalty, commissions or other charges, which may be leviable on account of any of his operations connected with this contract. In case BHEL is forced to make any such payment, BHEL shall recover the same from the contractor either from moneys due to him or otherwise as deemed fit.
- 26.6 While BHEL will pay the **inspection fees of the Boiler/ Electrical** Inspectorate, all other arrangements for the periodical visits of Boiler/ Electrical Inspector to site, inspection certificates etc. will have to be made by the contractor at his cost. The contractor will also meet all expenses in connection with his welder's qualification/ re-qualification tests etc.
- 26.7 The contractor shall be responsible for the provision of health and sanitary arrangements more particularly described in the Contract Labour (Regulations and Abolition Act, 1970) and safety precautions as may be required for safe and satisfactory execution of the contract.
- 26.8 The contractor shall be responsible for proper accommodation including adequate medical facilities for the personnel employed by him.
- 26.9 The contractor shall be responsible for the proper behavior and observance of all regulations by the staff employed by him.
- 26.10 The contractor shall ensure that no damage is caused to any person/ property of other parties working at site. If any such damage is caused, it shall be the responsibility of the contractor to make good the losses and compensate them.
- 26.11 All the properties/ equipment/ components of BHEL/ its customer loaned with or without deposit, to the contractor shall remain the properties of BHEL/ its customer. The contractor shall use such properties for the purpose of execution of this contract. All such properties/ equipment/ components shall be taken to be in good condition unless notified to the contrary by the contractor within 48 hours. The contractor shall return them in good condition as and when required by BHEL/ its customer. In case of non-return, loss, damage, repairs etc., the cost thereof, as may be fixed by the Engineer, will be recovered from the contractor.
- 26.12 It shall not be obligatory on the part of BHEL to supply any tools and tackles or materials other than those specifically agreed to be given by BHEL. However, depending upon availability/ possibility, BHEL/ its customer's equipment and other materials may be made available to conditions laid down by BHEL/ its customer from time to time. Unless paid in advance, such hire and other charges shall be recovered from out of dues to the contractor or security deposit in one installment.
- 26.13 The contractor shall fully indemnify and keep indemnified BHEL/ its customer against all claims of whatever nature arising during the course of execution of this contract.
- 26.14 In case the contractor is required to undertake any work outside the scope of this contract, the amount payable shall be as may be mutually agreed upon.

- 26.15 Any delay in completion of works or non-achievement of periodical targets, due to reasons attributable to the contractor, will have to be compensated by the contractor either by increased manpower and resources or by working extra hours or more than one shift at no extra cost to BHEL.
- 26.16 The contractor shall execute the work under the conditions usual to such power plant construction and in conjunction with numerous other operations at site. The contractor and his personnel shall cooperate and coordinate with other agencies at project site and proceed in a manner that shall help in the progress of work at site as a whole.
- 26.17 The contractor will be directly responsible for payment of wages to his workmen. A payroll sheet giving details of all payments made to the workmen duly signed by the contractor's representative should be furnished to BHEL, if called for.
- 26.18 In case of any class of work for which there is no specification laid down in the contract, such work shall be carried out in accordance with the instructions and requirements of the Engineer.
- 26.19 No levy, payment or charges made or imposed shall be impeached by reason of any clerical error or by reason of any mistake in the amount levied, demanded or charged.
- 26.20 ***No idle labour charges will be admissible in the event of any stoppage of work resulting in the contractor's workmen being rendered idle due to any reason at any time.***
- 26.21 The contractor shall take all reasonable care to protect the materials and the work till such time the plant/ equipment has been taken over by BHEL/ its customer.
- 26.22 Contractor shall not stop work or abandon the site for whatsoever reason or dispute, excepting for force majeure conditions. All problems/ disputes shall be separately discussed and settled without affecting the progress of work. Stoppage or abandonment of work, other than under force majeure conditions, shall be treated as breach of work of contract and dealt with accordingly.
- 26.23 The contractor shall keep the area of work clean and shall remove the debris etc. while executing day-to-day work. Upon completion of work, the contractor shall remove from the vicinity of work, all scrap, packing materials, rubbish, unused and other materials and deposit them in places specified by the Engineer. The contractor will also demolish all the hutments, sheds, offices, etc. constructed and used by him and shall clean the debris. In the event of his failure to do so, the same will be arranged to be done by the Engineer and the expenses recovered from the contractor.
- 26.24 The contractor shall execute the work in the most substantial and workman like manner in the stipulated time. Accuracy of work and timely execution shall be the essence of this contract. The contractor shall be responsible to ensure that the quality, assembly and workmanship conform to the dimensions and clearance given in the drawings and/ or as per the instructions of the Engineer.

- 26.25 The contractor shall furnish fortnightly labour deployment report indicating the classification and number of workmen engaged, date wise and category wise. Besides, the contractor shall also furnish progress reports on work at regular intervals as required by the Engineer.
- 26.2.1 **RESPONSIBILITIES OF CONTRACTOR IN RESPECT OF SAFETY OF MEN, EQUIPMENT, MATERIAL AND ENVIRONMENT.**
- 27.1 All safety rules and codes applied by BHEL and its customer at site shall be observed by the contractor and his workmen without exception. The contractor shall be responsible for the safety of the equipment/ material and work to be performed by him and shall maintain all lights, fencing guards, signs etc. or other protections necessary for the purpose. Contractor shall also take such additional precautions as may be indicated from time to time by the Engineer, with a view to prevent pilferage, accidents, fire hazards etc. Suitable number of clerical staff, watch and ward, store keepers to take care of equipment, materials, construction tools and tackles shall be posted at site by the contractor till the completion of the work under this contract. The contractor shall arrange for such safety devices as are necessary for this type of work and carry out the requisite site tests of handling equipment, lifting tools, tackles etc. as per usual standards and practices.
- 27.2 The contractor shall provide to its work force and ensure the use of the following personal protective equipment as found necessary and as directed by the authorized BHEL officials.
- (a) Safety Helmets conforming to IS-2925
  - (b) Safety Belts conforming to IS-3521
  - (c) Safety shoes conforming to IS-1989
  - (d) Eye & Face Protection devices conforming to IS-8520 and IS-8940
  - (e) Hand & body protection devices conforming to IS-2573, IS-6994, IS-8807 & IS-8519.
- 27.3 All tools, tackles, lifting appliances, material handling equipment, scaffolds, cradles, safety nets, ladders, equipment etc. used by the contractor shall be of safe design and construction. These shall be tested and certificate of fitness obtained before putting them to use and from time to time as instructed by authorized BHEL official who shall have the right to ban the use of any item.
- 27.4 All electrical equipment, connections and wiring for construction power, its distribution and use shall conform to the requirements of Indian Electricity Act and Rules. Only electricians licensed by the appropriate statutory authority shall be employed by the contractor to carry out all types of electrical works. All electrical appliances including portable electric tools used by contractor shall have safe plugging system to source of power and be appropriately earthed.
- 27.5 The contractor shall not use any hand lamp energised by electric power with supply voltage of more than 24 volts. For work in confined spaces, lighting shall be arranged with power source of not more than 24 volts.

- 27.6 Where it becomes necessary to provide and/ or store petroleum products, explosives, chemicals and liquid or gaseous fuel or any other substance that may cause fire or explosion, the contractor shall be responsible for carrying out such provision and/ or storage in accordance with the rules and regulations laid down in the relevant Government Acts, such as Petroleum Act, Explosives Act, petroleum and Carbides of Calcium Manual of the Chief Controller of Explosives, Government of India etc. Prior approval of the authorised BHEL official at the site shall also be taken by the contractor in all such matters.
- 27.7 The contractor shall arrange at his cost (wherever not specified) appropriate illumination at all work spots for safe working, when natural daylight may not be adequate for clear visibility.
- 27.8 In case of a fatal or disabling injury/ accident to any person at construction sites due to lapses by the contractor, the victim and/ or his / her dependents shall be compensated by the contractor as per statutory requirements. However, if considered necessary, BHEL shall have the right to impose appropriate financial penalty on the contractor and recover the same from payments due to the contractor for suitably compensating the victim and/ or his/ her dependents. Before imposing any such penalty, appropriate enquiry shall be held by BHEL giving opportunity to the contractor to present his case.
- 27.9 In case of any damage to property due to lapses by the contractor, BHEL shall have the right to recover the cost of such damages from the payments due to the contractor after holding an appropriate enquiry.
- 27.10 In case of any delay in the completion of a job due to mishaps attributable to lapses by the contractor, BHEL shall have the right to recover cost of such delay from the payments due to the contractor, after notifying the contractor suitably and giving him opportunity to present his case.
- 27.11 If the contractor fails to improve the standards of safety in its operation to the satisfaction of BHEL after being given reasonable opportunity to do so and/ or if the contractor fails to take appropriate safety precautions or to provide necessary safety devices and equipment or to carry out instructions regarding safety issued by the authorized BHEL official, BHEL shall have the right to take the corrective steps at the risk and cost of the contractor after giving a notice of not less than seven days indicating the steps that would be taken by BHEL.
- 27.12 The contractor shall submit report of all accidents, fires, property damage and dangerous occurrences to the authorized BHEL official immediately after such occurrence, but in any case not later than 12 hours of the occurrence. Such reports shall be furnished in the manner prescribed by BHEL. In addition, periodic reports on safety shall also be submitted by contractor to the authorized BHEL official from time to time as prescribed.
- 27.13 During the course of construction, alteration or repairs scrap lumbars with protruding nails, sharp edges etc., and all other debris including combustible scrap shall be kept cleared from working areas, passage ways and stairs in and around site.

- 27.14 Cylinders shall be moved by tilting and rolling them on their bottom edges. They shall not be intentionally dropped, struck or permitted to strike each other violently. When cylinders are transported by powered vehicles, they shall be secured in a vertical position.
- 27.15 The contractor shall be responsible for the safe storage of his radioactive sources.
- 27.16 All the contractor's supervisory personnel and sufficient number of workers shall be trained for fire fighting and shall be assigned specific fire protection duties. Enough number of such trained personnel must be available during the tenure of the contract.
- 27.17 Contractor shall provide enough fire protecting equipment of the types and numbers at his office, stores, erection site, other temporary structures, labour colony area etc. Access to such fire protection equipment shall be easy and kept open at all times. Compliance of the above requirement under fire protection shall in no way relieve the contractor of any of his responsibility and liabilities to fire accident occurring. In the event fire safety measures are not to BHEL's satisfaction, BHEL shall have option to provide the same and recover the cost plus incidentals from contractor's bills and/ or impose penalty as deemed fit by the Engineer.
- 27.18 Before commencing the work, the contractor shall appoint/ nominate a responsible officer to supervise implementation of all safety measures and liaison with his counterpart of BHEL.
- 27.19 If safety record of the contractor in execution of the awarded job is to the satisfaction of Safety Department of BHEL, issue of an appropriate certificate to recognize the safety performance of the contractor may be considered by BHEL after completion of the job.

## **28.0 CONSEQUENCES OF CANCELLATION**

- 28.1 Whenever BHEL exercises its authority to terminate the contract/ withdraw a portion of work under clause 25, the work may be got completed by any other means at the contractor's risk and cost provided that in the event of the cost of completion (as certified by the Engineer which shall be final and binding on the contractor) being less than the contract value, the advantage shall accrue to BHEL. If the cost of completion exceeds the moneys due to the contractor under the contract, the contractor shall either pay the excess amount demanded by BHEL or the same shall be recovered from the contractor. This will be in addition to the forfeiture of Security Deposit and recovery of liquidated damages as per relevant clauses.
- 28.2 In case BHEL completes the work under the provisions of this clause, the cost of such completion to be taken into account for determining the excess cost to be charged to the contractor shall consist of cost of materials purchased and/ or labour provided by BHEL with an addition of such percentage to cover supervision and establishment charges as may be decided by BHEL.

## **29.0 INSURANCE**

- 29.1 BHEL/ its customer shall arrange for insuring the materials/ property of BHEL/ its customer covering the risks during transit, storage, erection and commissioning.
- 29.2 It shall be the sole responsibility of the contractor to insure his workmen against risks of accidents and injury while at work as required by the relevant Rules and to pay compensation, if any, to them as per Workmen's Compensation Act. The contractor shall also insure his staff against accidents. The work will be carried out in a protected area and all the Rules and Regulations of BHEL/ its client, in the Project Area which are in force from time to time will be followed by the contractor.
- 29.3 If due to negligence and/ or non-observance of safety and other precautions, any accident/ injury occurs to any other persons/ public, the contractor shall pay necessary compensation and other expenses, if so decided by the appropriate authority.
- 29.4 The contractor will take necessary precautions and due care to protect the material, while in his custody from any damage/ loss till the same is taken over by BHEL or customer. For lodging/ processing of insurance claim the tractor will submit necessary documents. BHEL will reserve the right to recover the loss from the contractor, in case the damage/ loss is due to carelessness/ negligence on the part of the contractor. In case of any theft of material under contractor's custody, matter shall be reported to police by the contractor immediately and copy of FIR and subsequently police investigation report shall be submitted to BHEL for taking up with insurance.
- 29.5 If due to negligence/ carelessness on the part of the contractor, any material/ equipment gets damaged, the contractor shall submit necessary documents for lodging insurance claims as required by BHEL Engineer. BHEL however reserves the right to recover deductible franchise and also unsettled portion of insurance claim amount from the contractor.
- 29.6 If due to negligence/ carelessness on the part of the contractor, any surrounding properties also get damaged, the contractor shall submit necessary documents for lodging insurance claims as required by BHEL Engineer. BHEL shall however reserves the right to recover deductible franchise and to unsettled portion of insurance claim amount from the contractor.
- 29.7 The contractor may note that BHEL T&Ps/ IMTEs are not insured. The Contractor will take necessary precautions and due care to protect the same while in his custody from any damage/ loss till the same is handed over back to BHEL. In case the damage/ loss is due to carelessness/ negligence on the part of the contractor, the Contractor is liable to get them repair/ replaced immediately and in case of his failure to do so within a reasonable time, BHEL will reserve the right to recover the loss from the contractor.

### **30.0 STRIKES AND LOCKOUTS**

- 30.1 The contractor will be solely responsible for all disputes and other issues connected with his workmen. In the event of contractor's workmen resorting to strike or the contractor resorting to lockout and if the strike or lockout so declared is not settled within a period of one month, BHEL shall have the right to get the erection work executed by employing its own men or

- through other agencies or both. The cost incurred by BHEL in this regard shall be recovered from the contractor.
- 30.2 For any purpose whatsoever, the employees of the contractor shall not be deemed to be in the employment of BHEL
- 31.0 FORCE MAJEURE**
- 31.1 The following shall amount to force majeure conditions. Acts of God, Act of any Government, War, Sabotage, Riots, Civil Commotion, Police Action, Revolution, Flood, Fire, Cyclone, Earthquake and Epidemic and other similar causes over which the contractor has no control.
- 31.2 If the contractor suffers delay in the due execution of the contract, due to delays caused by force majeure conditions, as defined above, the agreed time for completion of the work covered by this contract shall be extended by a period of time equal to the period of delay, provided that on the occurrence of any such contingency, the contractor immediately reports to BHEL in writing the causes for the delay but the Contractor shall not be eligible for any compensation on this account.
- 32.0 **GUARANTEE:** Even though the work will be carried out under the supervision of the Engineer, the contractor will be responsible for the quality of the workmanship and shall guarantee the work done for a period of twelve months from the date of completion of work as certified by the Engineer, and shall rectify, free of cost to BHEL, all defects arising out of faulty erection during the guarantee period starting from the date of completion of rectification. In the event of the contractor failing to repair the defective works within the time specified by the Engineer, BHEL may proceed to undertake the repairs of such defective works at the contractor's risk and cost, without prejudice to any other rights and recover the same from out of any moneys payable to the contractor or by other legal means.
- 33.0 **ARBITRATION:** All disputes between the parties to the contract arising out of or in relation to the contract, other than those for which the decision of the Engineer or any other person is by the contract expressed to be final and conclusive, shall after written notice by either party to the contract to the other party, be referred to sole arbitration of the General Manager or his nominee. The arbitration shall be conducted in accordance with the provisions of the Arbitration and Reconciliation Act, 1996. The parties to the contract understand and agree that it will be no objection that the General Manager or the person nominated as Arbitrator had earlier in his official capacity to deal directly or indirectly with the matters to which the contract relates or that in the course of his official duties had expressed views on all or any of the matters in dispute or difference. The award of the Arbitrator shall be final and binding on the parties to this contract. In the event of the Arbitrator dying, neglecting or refusing to act or resigning or being unable to act for any reason or his award being set aside by the Court for any reason, it shall be lawful for the General Manager or his successor, as the case may be, either to act himself as the Arbitrator or to appoint another Arbitrator in place of the outgoing Arbitrator in the manner aforesaid.

The Arbitrator may, from time to time, with the consent of both the parties to the contract, enlarge the time for making the award. Work under the contract shall be continued during the arbitration proceedings. The venue of the arbitration shall be the place from which the contract is issued or such other place as the Arbitrator at his discretion may determine.

--X--X--

**FINANCIAL VIABILITY**

1. Owner's capital in the business (incase of Partnership, please mention percentage shares and amounts).
2. Quantum of business done during last three financial years.
  - i) Rs.
  - ii) Rs.
  - iii) Rs.
3. Value of fixed Assets of the business in last three years.
  - i) Rs.
  - ii) Rs.
  - iii) Rs.
4. Guarantee limits (if any) enjoyed by the firm.
5. Over-draft limits (if any enjoyed by the firm.
6. Please enclose audited profit and loss account and balance sheet for last 3 years (indicate no. of sheets).
7. Certificate from Scheduled Bank to prove Contractor's financial capacity to undertake the work duly indicating the financial limits the tenderer enjoys.

(Signature of tenderer)  
With Stamp

**NOTE:**

All the above documents should be duly certified by auditors/ Bank as may be applicable.

## ANALYSIS OF SIMILAR JOBS EXECUTED/ IN PROGRESS

S.No.	Agency By whom Awarded	Location of project	Capacity & unit nos.	Scope of work and tonnage	Date of award	Contract value
1	2	3	4	5	6	7

%age work completed and due date for completion	Date of completion if job is already over	No. of skilled/ unskilled workers deployed at peak	No. of Engrs. & Super- visors deployed at peak	Details of major T&P like cranes, Tractor Trailors, Winches, welding M/cs supplied		Consumables by whom
				By Con- Tractor	By other Agency	
8	9	10	11	12	13	14

(SIGNATURE OF TENDERER)  
WITH STAMP

**ANNEXURE – C**

**MONTHWISE MANPOWER DEPLOYMENT PLAN**

---

S.No.	Category	No. of Person available on roll of the Organisation	Month (Indicate No. of persons to be deployed in each month)					
			Ist	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	6 <sup>th</sup> and so on
1.								
2.								
3.								
Total								

---

(SIGNATURE OF TENDERER)  
WITH STAMP

**(A) STATUS OF TOOLS & PLANTS**

S.No.	Name of Equipment	Quantity owned	Registration no. wherever Applicable	Documents enclosed for proof of Ownership	Present Location	Quantity proposed to be deployed for this job
-------	-------------------	----------------	--------------------------------------	---	------------------	---

**(B) MONTHWISE T&P DEPLOYMENT PLAN**

S.No.	Description of T & P	Month (Indicate No. to be deployed in each month)							
		Ist	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	6 <sup>th</sup>	7 <sup>th</sup>	8 <sup>th</sup>

(SIGNATURE OF TENDERER)  
WITH STAMP

**ANALYSIS OF UNIT RATE QUOTED**

S.NO.	DESCRIPTION	PERCENTAGE OF THE UNIT RATE QUOTED	REMARKS
1.	Salary & wages for staff & workers		
2.	Consumables		
	(a) Gases		
	(b) Welding Electrodes		
	(c) P.O.L.		
	(d) Others		
3.	Depreciation & maintenance for T&P		
4.	Depreciation & Maintenance for other items		
5.	Establishment and Administration expenses of site		
6.	Overheads		
7.	Profit		

(SIGNATURE OF TENDERER)  
WITH STAMP

**DECLARATION SHEET**

I, -----hereby certify that, all the information and data furnished by me with regard to this Tender Specification No.----- are true and complete to the best of my knowledge. I have gone through the specification, conditions and stipulations in detail and agree to comply with the requirements and intent of specification.

I, further certify that I am the duly authorised representative of the under mentioned tenderer and a valid power of attorney to this effect is also enclosed.

Tenderer's Name & Address

Authorised representative's signature with name and address.

**CHECKLIST AND SCHEDULE OF GENERAL PARTICULARS**

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

1. Name and address of the tenderer
2. Telegraphic/ telex address
3. Phone No. (Office)/ Fax No.
4. Name & designation of the official of the tenderer to whom all the references shall be made.
5. Tenderer's proposal No. & date
6. Whether EMD submitted (By cash/ Pay order/ bank draft by.....)
7. Validity of offer/ rates quoted for six months from the date of opening of tender Yes/No
8. Financial Status as per Clause 11.1 (in the format as per Annexure-A) Yes/No
9. Income tax Clearance certificate as per Clause 11.2 Yes/No
10. Details of experience as per clause 11.3 (in the format as per Annexure-B) Yes/No
11. Monthwise & Categorywise manpower deployment plan as per Clause 11.4 (in the format as per Annexure-C) Yes/No
12. Attested copy of power of attorney as per clause 11.5 Yes/No
13. Details about type of the firm as per clause 11.6 Yes/No
14. Status of T&P and monthwise deployment plan as per clause 11.7 (in the format as per Annexure-D) Yes/No

15. Analysis of unit rate quoted as per Clause 11.8  
(in the format as per Annexure-E) Yes/No
16. Declaration sheet as per clause 11. 09  
(in the format as per Annexure-F) Yes/No

Date \_\_\_\_\_

(SIGNATURE OF TENDERER)  
WITH STAMP

WITNESS  
(SIGNATURES WITH FULL PARTICULARS)

1.

2.

**ANNEXURE - H**

**BANK GUARANTEE FOR SECURITY DEPOSIT**

B.G. NO.

Date

This deed of Guarantee made this ----- day of -----two thousand by ----- (Bank) hereinafter called the "The Guarantor" (which expression shall unless repugnant to the context or meaning thereof be deemed to include its successors and assigns) in favour of M/s Bharat Heavy Electrical Limited (A Govt. of India Undertaking) a company incorporated under the Companies Act, 1956, having its registered office at BHEL House, Siri Fort, Asiad, New Delhi – 110 049 through its unit at Power Sector – Northern Region, Noida, Distt. Gautam Budh Nagar, (UP) hereinafter called "The Company" (which expression shall unless repugnant to the context or meaning thereof by deemed to include its successors and assigns)

WHEREAS -----(hereinafter referred to as the Contractor) have entered into a contract arising out of Letter of Intent no.----- dt.----- (hereinafter referred to as "the contract") for the construction of ----- with the company.

AND WHEREAS the contract inter-alia provides that the contractor shall furnish to the company a sum of Rs.----- (Rupees-----) towards security deposit for due and faithful performance of the contract in the form and manner specified therein.

AND WHEREAS the contractor has approached the Guarantor and in consideration of the arrangement arrived at between the contractor and the Guarantor, the Guarantor has agreed to give the Guarantee as hereinafter mentioned in favour of the company.

The Guarantor do hereby guarantee to the company the due and faithful performance, observance or discharge of the Contract by the contractor and further unconditionally and irrevocably undertake to pay to the Company without demur and merely on a demand, to the extent of Rs.----- (Rupees-----) against any claim by the company on them for any loss, damage, costs, charges and expenses caused to or suffered by the company by reasons of the contractor making any default in the performance, observance or discharge of the terms, conditions, stipulations or undertakings or any of them as contained in the contract.

The decision of the company whether any default has occurred or has been committed by the contractor in the performance, observance or discharge of any of the terms, conditions, stipulations or undertakings or any one of them as contained in the contract and / or as to the extent of loss, damage, costs, charges and expenses caused to or

suffered by the company by reason of the contractor making any default in the performance, observance or discharge of any of the terms, conditions, stipulations or undertakings or any one of them shall be conclusive and binding on the Guarantor irrespective of the fact whether the contractor admits or denies the default or questions the correctness of any demand made by the company in any Court, Tribunal or Arbitration proceedings or before any other Authority.

The company shall have the fullest liberty without affecting in any way the liability of the Guarantor under this Guarantee, from time to time to vary any of the terms and conditions of the contract or extend time of performance by the contractor or to postpone for any time and from time to time any of the powers exercisable by it against the contractor and either enforce or forebear from enforcing any of the terms and conditions governing the contract or securities available to the company and the Guarantor shall not be released from its liability under these presents by any exercise by the company of the liberty with reference to the matters aforesaid or by reasons of time being given to the contractor or any other forbearance, act or commission on the part of the company or any indulgence by the company to the contractor or any other matter or thing whatsoever which under the law relating to sureties would, but for this provision have the effect of so releasing the Guarantor from its liability under this guarantee.

The Guarantor further agrees that the Guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the contract and its claim satisfied or discharged and till the company certifies that the terms and conditions of the contract have been fully and properly carried out by the contractor and accordingly discharges this Guarantee, subject however, that the company shall have no claim under this Guarantee after ----- i.e. (the present date of validity of Bank Guarantee unless the date of validity of this Bank Guarantee is further extended from time to time, as the case may be) unless a notice of the claim under this Guarantee has been served on the Guarantor before the expiry of the said period in which case the same shall be enforceable against the Guarantor notwithstanding the fact that the same is enforced after the expiry of the said period.

The Guarantor undertakes not to revoke this Guarantee during the period it is in force except with the previous consent of the Company in writing and agrees that any liquidation or winding up or insolvency or dissolution or any change in the constitution of the contractor or the Guarantor shall not discharge the Guarantor's liability hereunder.

It shall not be necessary for the company to proceed against the contractor before proceeding against the Guarantor and the Guarantee herein contained shall be enforceable against them notwithstanding any security which the Company may have obtained or obtain from the Contractor shall at the time when proceedings are taken against the Guarantor hereunder be outstanding or unrealized.

Notwithstanding anything contained herein before, our liability under the Guarantee is restricted to Rs.----- (Rupees-----). Our guarantee shall remain inforce until -----, i.e. (the present date of validity

of Bank Guarantee unless the date of validity of this Bank Guarantee is further extended from time to time) unless a claim or demand under this guarantee is made against us on or before ----- we shall be discharged from our liabilities under this Guarantee thereafter.

Any claim or dispute arising under the terms of this document shall only be enforced or settled in the courts of at New Delhi / Delhi only.

The Guarantor hereby declares that it has power to execute this guarantee and the executant has full powers to do so on behalf of the Guarantor.

IN WITNESS whereof the ----- (Bank) has hereunto set and subscribed its hand the day, month and year first, above written.

Signed for and on behalf of the Bank

(Signatory No.-----)

#### WITNESSES

1. Name & Address

2. Name & Address

#### Notes:

1. The above BG shall be executed on the non-judicial stamp papers of adequate value procured in the name of the bank in the state where the bank is located.
2. The above BG is required to be sent by the executing bank directly to BHEL at the address where tender is submitted/ accepted under seal cover.

## LIST OF MEMBER BANKS

1. State Bank of India  
CAG Branch,  
10<sup>th</sup> Floor, Vijaya Building,  
Barakhamba Road,  
New Delhi – 110 001.
2. Canara Bank  
74, Janpath,  
New Delhi – 110 001.
3. Punjab National Bank,  
74, Janpath,  
New Delhi – 110 001.
4. Bank of Baroda,  
Corporate Banking Branch,  
11<sup>th</sup> Floor, BOB Building,  
Sansad Marg,  
New Delhi – 110 001.
5. State Bank of Hyderabad,  
Surya Kiran Building, K.G. Marg,  
New Delhi – 110001.
6. State Bank of Mysore,  
Antriksh Bhawan, K.G. Marg,  
New Delhi – 110001.
7. State Bank of Mysore,  
Industrial Finance Branch,  
18, Ramanashree Arcade,  
M.G. Road, Bangalore – 560 001.
8. State Bank of Travancore,  
Travancore House, IF Branch,  
K.G. Marg, New Delhi – 110 001.
9. Deutsche Bank,  
Tolstoy Marg,  
New Delhi – 110 001.
10. HDFC Bank Ltd.,  
5<sup>th</sup> Floor, HT House,  
K.G. Marg,  
New Delhi – 110 001.
11. Citi Bank N A  
Jeevan Vihar Building,  
Sansad Marg,  
New Delhi – 110 001.
12. Standard Chartered Bank,  
H2 Block, Connaught Place,  
New Delhi – 110 001.
13. ICICI Bank Ltd.,  
ICICI Tower,  
Bisham Pitamah Marg,  
Pragati Vihar,  
New Delhi – 110 003.
14. IDBI Bank Ltd.,  
19, K.G. Marg,  
Surya Kiran Building,  
New Delhi.
15. HSBC Ltd.,  
ECE House,  
28 KG Marg,  
New Delhi – 110 001.

AGREEMENT

Agreement No. and Date \_\_\_\_\_  
 Name of the Work \_\_\_\_\_  
 \_\_\_\_\_  
 Name of the Contractor with full address \_\_\_\_\_  
 \_\_\_\_\_  
 Value of work awarded \_\_\_\_\_  
 \_\_\_\_\_  
 Letter of Intent No. and Date \_\_\_\_\_  
 \_\_\_\_\_  
 Scheduled Commencement Date \_\_\_\_\_  
 Scheduled Completion Date \_\_\_\_\_

THIS AGREEMENT MADE THIS \_\_\_\_\_ DAY OF \_\_\_\_\_ 2000 between BHARAT HEAVY ELECTRICALS LIMITED (A Government of India Enterprise) a Company incorporated under the Companies Act, 1956, having its Registered Office at BHEL House, Siri Fort New Delhi- 110049 (herein after called BHEL) of the ONE PART.

AND

M/S \_\_\_\_\_ (hereinafter called the `Contractor') of the SECOND PART.

WHEREAS M/s -----state that they have acquired and possess extensive experience in the field of -----

And Whereas in response to an Invitation to Tender No. ----- issued by BHEL for execution of ----- the contractor submitted their offer No.-----dated -----And whereas BHEL has accepted the offer of the Contractor on terms and conditions specified in the Letter of Intent No.-----dated -----read with the references cited therein.

THIS AGREEMENT WITNESSES AND it is hereby agreed by and between the parties as follows:

1. That the contractor shall execute the work of -----and more particularly described in Tender Specification No -----including Drawings and Specifications (hereinafter called the said works) in accordance with and subject to terms and conditions contained in these presents, instructions to Tenderers, General Conditions of Contract, Special Conditions, Annexures, Letter

of Intent dated -----and such other instructions, Drawings, Specifications given to him from time to time by BHEL.

2. The Contractor is required to furnish to BHEL Security deposit in the form of cash/ approved securities/ Bank Guarantee valid upto ----- for a sum of Rs.----- --- towards satisfactory performance and completion of the Contract.
3. The Contractor has furnished a Bank Guarantee bearing no.-----dated -----for a sum of Rs.-----executed by ----- in favour of BHEL towards Security Deposit valid upto -----

OR

The Contractor has furnished to BHEL an initial Security Deposit of Rs.----- --in the form of cash/ approved Securities/ B.G No.----- dated ----- for Rs.-----executed by ----- in favour of BHEL valid upto ----- and has agreed for recovery of the balance security deposit by BHEL @ 10% of the value of work done from each running bill till the entire Security Deposit is recovered.

OR

The contractor has furnished to BHEL an initial Security Deposit of Rs.-----(Rs.---- vide Bank draft No.-----dated -----and by adjusting EMD of Rs.-----submitted vide Bank draft No.----- dt.-----) and has agreed for recovery of balance Security Deposit by BHEL @ 10% of the value of work done from each running bill till the entire security deposit is recovered.

4. The Contractor hereby agrees to extend the validity of the Bank Guarantee for such further period or periods as may be required by BHEL and if the Contractor fails to obtain such extension(s) from the Bank, the Contractor, shall pay forthwith or accept recovery of Rs.----- from the bills in one installment and the contractor further agrees that failure to extend the validity of the Bank Guarantee or failure to pay the aforesaid amount in the manner specified above shall constitute breach of contract. In addition to above, BHEL shall be entitled to take such action as deemed fit and proper for recovering the said sum of Rs.-----.

OR

In case the contractor furnishes the bank guarantee at a later date the contractor hereby agrees to extend the validity of bank guarantee for such further period or periods as may be required by BHEL and if the contractor fails to obtain such extension(s) from the bank, the contractor shall pay forthwith or accept recovery of the amount of bank guarantee given in lieu of security deposit from the bills in one installment and the contractor further agrees that failure to extend the validity of

bank guarantee or failure to pay the aforesaid amount in the manner specified above shall constitute breach of contract. In addition to above, BHEL shall be entitled to take such action as deemed fit and proper for recovering the said sum.

5. That in consideration of the payments to be made to the Contractor by BHEL in accordance with this Agreement the Contractor hereby covenants and undertakes with BHEL that they shall execute, construct, complete the works in conformity, in all respects, with the terms and conditions specified in this Agreement and the documents governing the same.
6. That the Contractor shall be deemed to have carefully examined this Agreement and the documents governing the same and also to have satisfied himself as to the nature and character of the Works to be executed by him.
7. That the Contractor shall carry out and complete the execution of the said works to the entire satisfaction of the Engineer or such other officer authorised by BHEL, within the agreed time schedule, the time of completion being the essence of the Contract.
8. That BHEL shall, after proper scrutiny of the bills submitted by the Contractor, pay to him during the progress of the said works such sum as determined by BHEL in accordance with this Agreement.
9. That this Agreement shall be deemed to have come into force from ----- the date on which the letter of intent has been issued to the Contractor.
10. That whenever under this contract or otherwise, any sum of money shall be recoverable from or payable by the Contractor, the same may be deducted in the manner as set out in the General Conditions of Contract or other conditions governing this Agreement.
11. That all charges on account of Octroi, Terminal and other taxes including sales tax or other duties on material obtained for execution of the said works shall be borne and paid by the Contractor.
12. That BHEL shall be entitled to deduct from the Contractor's running bills or otherwise Income Tax under Section 194 (C) of the Income Tax Act, 1961.
13. That BHEL shall be further entitled to recover from the running bills of the Contractor or otherwise such sum as may be determined by BHEL from time to time in respect of consumables supplied by BHEL, hire charges for tools and plants issued (where applicable) and any other dues owed by the Contractor.
14. That it is hereby agreed by and between the parties that non- exercise, forbearance or omission of any of the powers conferred on BHEL and/ or any of its authorities will not in any manner constitute waiver of the conditions hereto contained in these

presents and the liability of the Contractor with respect to compensation payable to BHEL or Contractor's obligations shall remain unaffected.

15. It is clearly understood by and between the parties that in the event of any conflict between the Letter of Intent and other documents governing this Agreement, the provisions in the Letter of Intent shall prevail.

16. The following documents

1. Invitation to Tender No-----  
and the documents specified therein.
2. Contractor's Offer No-----  
dated-----.
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. Letter of Intent No \_\_\_\_\_  
dated\_\_\_\_\_.
7. \_\_\_\_\_

shall also form part of and govern this Agreement.

IN WITNESS HEREOF, the parties hereto have respectively set their signatures in the presence of

WITNESS

1.

2.

(CONTRACTOR)  
(to be signed by a person holding  
a valid Power of Attorney)

WITNESS

1.

2.

(For and on behalf of BHEL)

## **SECTION – I (a)**

### **SPECIFICATION**

#### **FOR**

#### **HEALTH, SAFETY AND ENVIRONMENT (HSE)**

##### **1.0 SCOPE**

This specification establishes the Health, Safety and Environment (HSE) management requirement to be complied with by the Contractors during construction.

Requirements stipulated in this specification shall supplement the requirements of HSE Management given in relevant Act (s)/ legislations, General Condition Contract (GCC). Special Conditions of Contract (SCC) and job specification where different documents stipulates different requirements, the most stringent be adopted.

##### **2.0 REFERENCES**

This document should be read in conjunction with following:

- General Conditions of Contract (GCC)
- Special Conditions of Contract (SCC)
- Scope of work
- Relevant IS Codes (refer Annexure-I)
- Reporting Formats (refer Annexure-II)

#### **REQUIREMENTS OF HEALTH, SAFETY & ENVIRONMENT (HSE) MANAGEMENT SYSTEM TO BE COMPLIED BY CONTRACTORS.**

##### **MANAGEMENT RESPONSIBILITY**

- 3.1.1 The Contractor to comply with HSE requirement at Construction sites as enclosed to cover commitment of their organization to ensure health, safety and environment aspects in their line of operations.
- 3.1.2 The HSE management system shall cover the HSE requirements including but not limited to what is specified under Para 1.0 and para 2.0 above.
- 3.1.3 Contractor shall be fully responsible for planning and implementing HSE requirements. Contractor as a minimum requirement shall designate/ deploy the following to co-ordinate the above:

No. of workers deployed upto 250	- Designate one safety Supervisor
Above 250 & upto 500	- Deploy one qualified and Experienced safety Engineer/ Officer
Above 500 (for every 500 or less)	- One additional safety engineer/ officer, as above.

Contractor shall indemnify & hold harmless Owner/ BHEL & their representatives free from any and all liabilities arising out of non-fulfillment of HSE requirement.

- 3.1.4 The Contractor shall ensure that the Health, Safety and Environment (HSE) requirements are clearly understood & faithfully implemented at all levels at site.
- 3.1.5 BHEL shall promote and develop consciousness for Health, Safety and Environment among all personnel working for the Contractor. Regular awareness programmes and work site meetings shall be arranged on HSE activities to cover hazards involved in various operations during construction.
- 3.1.6 The Contractor shall arrange suitable first aid measures such as First Aid Box, trained personnel to give First Aid and install fire protection measures such as adequate number of steel buckets with sand and water to the satisfaction of BHEL/ Owner.
- 3.1.7 Non-Conformance on HSE by Contractor (including his Sub-contractors) as brought out during review/ audit by BHEL/ Owner representative shall be resolved forthwith by Contractor. Compliance report shall be provided to BHEL.
- 3.1.8 The Contractor shall ensure participation of his Resident Engineer/ Site-In-Charge in the Safety Committee/ HSE Committees meetings arranged by BHEL/ Owner. The compliance of any observations shall be arranged urgently. He shall assist BHEL/ Owner to achieve the targets set by them on HSE during the project implementation.
- 3.1.9 The Contractor shall adhere consistently to all provisions of HSE requirements. In case of non-compliance or continuous failure in implementation of any of HSE provisions, BHEL/ Owner may impose stoppage of work without any Cost & Time implication to BHEL/ Owner and/ or impose a suitable penalty for non-compliance with a notice of suitable period, upto a commulative limit of 1.0% (one percent) of Contract value. This penalty shall be in addition to all other penalties specified else where in the contract. The decision of imposing stoppage of work, its extent & minority penalty shall rest with BHEL/ Owner & binding on the Contractor.

3.1.10 All fatal accidents and other personnel accidents shall be investigated by a team of Contractor's senior personnel for root cause & recommended corrective and preventive actions. Findings shall be documented and suitable actions taken to avoid recurrences shall be communicated to BHEL/ Owner. BHEL/ Owner shall have the liberty to independently investigate such occurrences and Contractor shall extend all necessary help and co-operation in this regard.

## **3.2 HOUSE KEEPING**

3.2.1 Contractor shall ensure that a high degree of house keeping is maintained and shall ensure interalia; the following:

- a) All surplus earth and debris are removed/ disposed off from the working areas to identified locations (s).
- b) Unused/ Surplus Cables, Steel items and steel scrap lying scattered at different places within the working areas are removed to identified locations (s).
- c) All wooden scrap, empty wooden cable drums and other combustible packing materials, shall be removed from work place to identified location(s).
- d) Roads shall be kept clear and materials like pipes, steel, sand boulders, concrete, chips and brick etc., shall not be allowed on the roads to obstruct free movement of men & machineries.
- e) Fabricated steel structurals, pipes & piping materials shall be stacked properly for erection.
- f) Water logging on roads shall not be allowed.
- g) No parking of trucks/ trolleys, cranes and trailers etc., shall be allowed on roads, which may obstruct the traffic movement.
- h) Utmost care shall be taken to ensure over all cleanliness and proper upkeep of the working areas.
- i) Trucks carrying sand, earth and pulverized materials etc., shall be covered while moving within the plant area.

In case of non-compliance of any of above, BHEL shall have the liberty to get it done from some other agency at this risk and cost.

## **3.3 HEALTH, SAFETY AND ENVIRONMENT**

- 3.3.1 The Contractor shall provide safe means of access to any working place including provisions of suitable and sufficient scaffolding at various stages during all operations of the work for the safety of his workmen, and BHEL/ Owner. Contractor shall ensure deployment of appropriate equipment and appliances for adequate safety and health of the workmen and protection of surrounding areas.
- 3.3.2 The contractor shall ensure that all their staff and workers wear Safety Helmet and Safety shoes. Contractor shall also ensure use of safety belt, protective goggles, gloves etc., by the personnel as per job requirements. All these gadgets shall conform to relevant IS specifications or equivalent.
- 3.3.3 The Contractor shall assign to his workmen, tasks commensurate with their qualification, experience and state of health for driving of vehicles, handling and erection of material and equipments. All lifting equipments shall be tested certified for its capacity before use. Adequate and suitable lighting at every work place and approach there to, shall be provided by the Contractor before starting the actual operations at night. It is mandatory for contractor to get his workmen medically examined/ checked for fitness of work assigned once a year and furnish the certificate to that effect from RMP/ Govt. Hospital.
- 3.3.4 Hazardous and/ or toxic materials such as solvent, coating or thinners shall be stored in appropriate containers.
- 3.3.5 All hazardous materials shall be labeled with the name of the materials, the hazards associated with its use and necessary precautions to be taken.
- 3.3.6 Contractor shall ensure that during the performance of the work, all hazards of the health of personnel, have been identified, assessed and eliminated.
- 3.3.7 Chemical spills shall be contained and cleaned up immediately to prevent further contamination.
- 3.3.8 All personnel exposed to physical agents such as ionizing or non-ionizing radiation, ultraviolet rays or similar other physical agents shall be provided with adequate shielding or protection commensurate with the type of exposure involved.
- 3.3.9 Where contact or exposure of hazardous materials could exceed limits or could otherwise have harmful effects, appropriate personnel protective equipment such as gloves, goggles, aprons, chemicals resistant clothing and respirator shall be used.
- 3.3.10 All persons deployed at site shall be knowledgeable of and comply with the environmental laws, rules & regulations relating to the hazardous materials substances and wastes. Contractor shall not dump, release or otherwise discharge

or dispose off any such materials without the express authorization of BHEL/ Owner.

#### **4.0 DURING JOB EXECUTION**

4.1 Implement Health, Safety and Environment requirements including but not limited to as brought out under para 3.0. Contractor shall ensure to:

- Arrange workmen compensation insurance, registration under ESI Act, third party liability insurance etc., as applicable.
- Arrange all HSE permits before start of activities (as applicable) like hot work, confined space, work at heights, storage of chemical/ explosive materials and its use and implement all precautions mentioned therein.
- Submit timely the completed checklist on HSE activities, Monthly HSE report, accident reports, investigation reports etc., as per BHEL/ Owner requirements. Compliance of instructions on HSE shall be done by Contractor and informed urgently to BHEL/ Owner.
- Ensure the Resident Engineer/ Site In-charge of the Contractor shall attend all the Safety Committee/ HSE meetings arranged by BHEL/ Owner. In case of his absence from site that a second senior most person shall be nominated by him in advance and communicated to BHEL/Owner.
- Display at site office and work locations caution boards, list of hospitals, emergency services available.
- Display posters, banners made available by BHEL for safe working to promote safety consciousness.
- Assist in HSE audits by BHEL/ Owner and submit compliance report.
- Generate and submit HSE records/ report as per HSE plan.
- Appraise BHEL/ Owner on HSE activities at site.

## ANNEXURE - I

### RELEVANT IS CODES FOR PERSONAL PROTECTION

IS: 2925-1984	Industrial Safety Helmets
IS: 4770-1968	Rubber gloves for electrical purposes
IS: 6994, 1973 (Part-I)	Industrial Safety Gloves (Leather & Cotton Gloves)
IS: 1989-1986 (Part I & III)	Leather safety boots and shoes
IS: 3738-1975	Rubber knee boots
IS: 5557-1969	Industrial and Safety rubber knee boots
IS: 6519-1971	Code of practice for selection, care and repair of Safety footwear
IS: 11226-1985	Leather Safety footwear having direct moulding sole
IS: 5983-1978	Eye protectors
IS: 9167-1979	Ear protectors
IS: 3521-1983	Industrial Safety belts and harness

**ANNEXURE – II**

**1.0 HEALTH, SAFETY & ENVIRONMENT (HSE) PLAN**

PROJECT: ----- CONTRACTOR:-----

DATE:----- OWNER:-----

(To be prepared by each construction Agency)

---

ACTIVITY DESCRIPTION	PROCEDURE/ W.I/ GUIDELIES	CODE OF CONFOR- MANCE	PERFORMING FUNCTIONS			AUDIT FUNCTION
			PERFOR- MER	CHECK- ER	APPRO- VER	CUSTOMER REVIEW AUDIT REQUIREMENT

---

PREPARED BY

REVIEWED BY

APPROVED BY  
(RESIDENT ENGINEER)

**2.0 MONTHLY HSE CHECKLIST CUM COMPLIANCE REPORT (1/6)**

PROJECT:----- CONTRACTOR:-----

DATE:----- OWNER:-----

INSPECTION BY:-----

Note: Write 'NA' wherever the item is not applicable.

---

ITEM	YES	NO	REMARKS	ACTION
------	-----	----	---------	--------

---

**HOUSE KEEPING**

Waste containers provided and used

Sanitary facilities adequate and clean

Passageways and Walkways Clear

General neatness of working areas

Others

**PERSONNEL PROTECTIVE EQUIPMENT**

Goggles: Shields

Face protection

Hearing protection

Safety Shoes provided

Hand protection

Safety Belts

Others

**EXCAVATIONS/ OPENINGS**

Openings properly covered or barricaded

Excavations shored

Excavations barricaded

Overnight lighting provided

Other

**MONTHLY HSE CHECKLIST CUM COMPLIANCE REPORT (Contd.. 2/6)**

<b>ITEM</b>	<b>YES</b>	<b>NO</b>	<b>REMARKS</b>	<b>ACTION</b>
<b>WELDING, CUTTING</b>				
Gas cylinders chained upright				
Cables and hoses not obstructing				
Screens or shields used				
Flammable materials protected				
Fire extinguisher (s) accessible				
Other				
<b>SCAFFOLDING</b>				
Fully decked platforms				
Guard and intermediate rails in place				
Toe boards in place				
Adequate shoring				
Adequate access				
Other				
<b>LADDERS</b>				
Extension side rails 1 m above				
Top of landing				
Properly secured				
Angle + 70 from horizontal				
Other				

## MONTHLY HSE CHECKLIST CUM COMPLIANCE REPORT (Contd.3/6)

ITEM	YES	NO	REMARKS	ACTION
------	-----	----	---------	--------

### HOIST, CRANES AND DERRICKS

Condition of cables and sheaves OK

Condition of slings, chains, hooks & eyes O.K.

Inspection and maintenance logs maintained

Outriggers used

Signs/ barricades provided

Signals observed and understood

Qualified operators

Other

### MACHINERY, TOOLS AND EQUIPMENT

Proper instruction

Safety devices

Proper cords

Inspection and maintenance

Other

### VECHICLE AND TRAFFIC

Rules and regulations observed

Inspection and maintenance

Licensed drivers

Other

## MONTHLY HSE CHECKLIST CUM COMPLIANCE REPORT (Contd.4/6)

ITEM	YES	NO	REMARKS	ACTION
<b>TEMPORARY FACILITIES</b>				
Emergency instructions posted				
Fire extinguishers provided				
Fire-aid equipment available				
Secured against storm damage				
General neatness				
In accordance with electrical requirements				
Other				
<b>FIRE PREVENTION</b>				
Personnel instructed				
Fire extinguishers checked				
No smoking in Prohibited areas				
Hydrants Clear				
Other				
<b>ELECTRICAL</b>				
Proper wiring				
ELCB's provided				
Ground fault circuit interrupters				
Protection against damage				
Prevention of tripping hazards				
Other				

## MONTHLY HSE CHECKLIST CUM COMPLIANCE REPORT (Contd.5/6)

ITEM	YES	NO	REMARKS	ACTION
------	-----	----	---------	--------

### HANDLING AND STORAGE OF MATERIALS

Properly stored or stacked

Passageways clear

Other

### FLAMMABLE GASES AND LIQUIDS

Containers clearly identified

Proper storage

Fire extinguishers nearby

Other

### WORKING AT HEIGHT

Erection plan

Safety belts and lanyards; chute lines

Other

### ENVIRONMENT

Chemical and other Effluents properly disposed

Cleaning liquid of pipes disposed off properly

Water used for hydrotesting disposed off as  
Per agreed procedure

Lubricant Waste/Engine Oil properly disposed

Waste from Canteen, offices, sanitation etc,  
Disposed properly

Disposal of surplus earth, stripping materials,  
Oily rags and combustible materials done properly

**MONTHLY HSE CHECKLIST CUM COMPLIANCE REPORT (Contd.6/6)**

ITEM	YES	NO	REMARKS	ACTION
Green belt protection				
Hygienic conditions at labour camps O.K?				
Availability of First Aid facilities				
Proper sanitation at site, office and Labour camps				
Arrangement of medical facilities				
Measures for dealing with illness				
Availability of Potable drinking water For workmen & staff				

**Signature of Resident  
Engineer with Seal**

**3.0 ACCIDENT CUM FIRE REPORT**

(To be submitted by contractor after every accident within 24 hours of accident)

Report : \_\_\_\_\_

Name of Site: \_\_\_\_\_

Date: \_\_\_\_\_

CONTRACTOR \_\_\_\_\_

---

**NAME OF THE INJURED** \_\_\_\_\_

**FATHER'S NAME** \_\_\_\_\_

**SUB-CONTRACTOR M/S** \_\_\_\_\_

**DATE & TIME OF ACCIDENT** \_\_\_\_\_

**LOCATION** \_\_\_\_\_

---

**BRIEF DESCRIPTION OF ACCIDENT**

---

**CAUSE OF ACCIDENT**

---

**NATURE OF INJURY/ DAMAGE**

---

**MEDICAL AID PROVIDED/ACTIONS TAKEN**

---

**INTIMATION TO LOCAL AUTHORITIES**

---

**DATE:**

**SIGNATURE OF CONTRACTOR  
WITH SEAL**

**TO: SITE-IN-CHARGE/BHEL**

**1 COPY**

**4.0 SUPPLEMENTARY ACCIDENT & INVESTIGATION REPORT**

Project: \_\_\_\_\_ Supplementary to Report No. \_\_\_\_\_  
(Copy enclosed)

Site: \_\_\_\_\_ Date: \_\_\_\_\_

CONTRACTOR \_\_\_\_\_

---

**NAME OF THE INJURED** \_\_\_\_\_  
**FATHER'S NAME** \_\_\_\_\_  
**SUB-CONTRACTOR M/S** \_\_\_\_\_  
**DATE & TIME OF ACCIDENT** \_\_\_\_\_  
**LOCATION** \_\_\_\_\_

---

**BRIEF DESCRIPTION & CAUSE OF ACCIDENT**

---

**NATURE OF INJURY/ DAMAGE**

---

**COMMENTS FROM MEDICAL PRACTITIONER, WHO ATTENDED THE VICTIM/ INJURED**

---

**SUGGESTED IMPROVEMENT IN THE WORKING CONDITION, IF ANY**

---

**LOSS OF MANHOURS AND IMPACT ON SITE WORKS**

---

**ANY OTHER COMMENT BY SAFETY OFFICER**

**DATE:**

**SIGNATURE OF CONTRACTOR  
WITH SEAL**

**TO: SITE-IN-CHARGE/BHEL**

**1 COPY**

## 5.0 MONTHLY HEALTH, SAFETY & ENVIRONMENT (HSE) REPORT

(To be submitted by each Contractor)

Actual work start Date: \_\_\_\_\_ For the month of \_\_\_\_\_

Project: \_\_\_\_\_ Report No. \_\_\_\_\_

Name of the Contractor: \_\_\_\_\_ Status as on: \_\_\_\_\_

Name of Work: \_\_\_\_\_ Name of safety officer \_\_\_\_\_

ITEM	THIS MONTH	CUMMULATIVE
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Total Strength (Staff + Workmen)

Number of HSE meetings organized at site

Number of HSE awareness programmes  
Attended at site

Whether workmen compensation policy taken Y/N

Whether workmen compensation policy is valid Y/N

Whether workmen registered under ESI Act Y/N

Number of Fatal Accidents

Number of Loss Time Accidents (Other than Fatal

Other accidents (Non Loss Time)

Total No. of Accidents

Total man-hours worked

Man-hour loss due to fire and accidents

Compensation cases raised with Insurance

Compensation cases resolved and paid to workmen

Remarks

Date

Safety Officer/ Resident Engineer  
(Signature & Name)

**To: SITE-IN-CHARGE, BHEL**

**1 COPY**

**SECTION - III `A`  
SPECIAL CONDITIONS OF CONTRACT**

**INDEX**

<b>Clause</b>	<b>Description</b>
34	General
35	Preliminary work
36	Civil works, foundation and grouting
37	Consumables
38	Tools & Plants/ IMTE's
39	Supervisory staff & workmen
40	Material handling and storage
41	Preservation of components
42	Cleaning of equipments
43	Erection
44	Welding, HT, RG & NDT
45	Application of Insulation
46	Testing, Pre-Commissioning, Commissioning & Post-Commissioning
47	Condenser painting
48	Finish Painting
49	Progress reporting
50	Drawings & documents
51	Income tax, Service Tax & Sales tax etc.
52	Extra work
53	Price Variation
54	Rate schedule
55	Instructions to tenderers

SECTION - III `A'  
SPECIAL CONDITIONS OF CONTRACT

**34.0 GENERAL**

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

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

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

**34.4** Following shall be the responsibility of contractor and have to be provided within finally accepted rates/ prices.

- A** Provision as required of all types of labour, Supervisors, Engineers, watch and ward, tools & tackles, calibrated inspection, measuring and test equipments as specified and otherwise required for the work, consumables for erection, testing and commissioning including material handling and PG test.
- B** Proper out-turn as per BHEL's plan and commitment
- C** Completion of work as per BHEL Schedule.
- D** Good quality and accurate workmanship for proper performances of equipment.
- E** Repair and rectification
- F** Preservation/ Re-conservation of all components during storage/ erection till handing over. All assistance during PG test
- G** Tacking delivery/lifting of component/ materials from store area within project complex
- F** Arrangement of Construction Power (if available by Customer) and water from single point terminal in project area.
- G** **HOUSE KEEPING**-The contractor is supposed to carryout house keeping of the work area on regular basis to keep the work place neat and tidy and available for the SAFE working. The scrap, generated daily during the Execution activities, is to be dumped at designated area as decided by BHEL/ EIL/ HMEL on daily basis. The erection materials issued to the contractor and kept near the work area should also be staged properly at site. Compliance report on above shall be submitted by the contractor to BHEL on Daily basis. In case the contractor fails to do so, BHEL have rights to carryout the same from the other party at the Risk and cost of the contractor. The cost applicable with BHEL overheads shall also be recovered from the monthly running bills of contractor.

**34.5 Health, Safety & Environment management (HSE)**

**BHEL-Power Sector (NR) is ISO 9001-2000, ISO 14001-1996, OHSAS 18001-1999, ISO 27001 and SA-8000 certified company. Quality of work, to customer's satisfaction and system requirements is the essence of these certifications. The contractor in**

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all respects will organize his work, systems, environment, process control documentation, tools, plant, inspection, measuring and testing equipments etc. as per instructions of BHEL engineer.

The contractor shall also comply with applicable legislation and regulations with regards to Health, Safety and Environmental aspects for minimizing risk arising from occupational health & safety hazards, controlling pollution and wastage. The Contractor will be responsible for Health, Safety & Environment management (HSE) at site for the construction activities to be carried out by them in accordance with requirements given under section I (a) of GCC and elsewhere in this tender document. The contractor, who is awarded the work, shall have to sign an MOU w.r.t. implementation of HSE conditions with BHEL (Safe Work Practices).

- 34.5.1 Besides provision with regard to SAFETY under Clause 27 of GCC, the contractor will be responsible for Health, Safety & Environment management at site for the construction activities to be carried out by them in accordance with requirements **given under section I(a) of GCC of this document**. The contractor shall continuously take special care to ensure the safety and prevention of human and equipment accidents and maintain good sanitary conditions in and around the site. All the construction work and plant operation must be carried out in the safest possible manner. The Engineer reserves the right to stop any process, which in the Engineer's opinion, is being performed dangerously. In this case the contractor must immediately adhere to the requisite safety precautions and any delays attributed to the work stoppage on this account shall not affect the agreed contractual finishing dates.

The contractor shall appoint dedicated full-time Qualified Safety Officers who shall have full authority to ensure that all necessary safety precautions are observed by the Contractor's employees and sub-contractors. These appointees shall have full responsibility for the safety of all personnel within the contractor's area of the works.

- 34.5.2** Some of the common safety rules to be followed during working are as follows:-

No body is allowed to enter at construction site without Safety Shoe.

Never enter work area without Safety helmet & chin strap in place.

No climbing/ working allowed without proper safety belt above 2 m. height.

Do not exceed the speed limit 25 Kmph within premises.

No debris obstacles allowed on the roads & passages.

Do not walk on pipelines or false ceiling.

Maintain good Housekeeping at work site.

No photography/ Videography allowed without permission

All Site Supervisors & Engineers (including subcontractor's) must be imparted structured training on construction safety before start of the job & record to be maintained.

Availability of Supervisors qualified & trained Site Engineer at site during all working hours.

Deployment of Safety for every 250 workers and part thereof, at work site.

Display of List of First Aid trained persons.

Testing certificates for lifting tools & tackle.

Provision & maintenance of fire extinguishers at construction site & material stores.

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Display of emergency telephone numbers at various locations.

For work in confined space use 24 V lamp fitting & use tools with air motors or electric tools with max. 24 V.

For confined space entry, Gas test must be done before and at regular intervals.

Site Safety training to be imparted to all workers & plan to be made to cover every worker.

Tools box talk (5-15 minutes) by supervisor prior to commencement of any job.

All accident/ incidents (Near Miss) to be reported & investigated (formats & procedure should be finalized)

Daily Safety Checking by Each Site Engineer along with Safety engineer.

Weekly co-ordination meeting of all Safety engineers with BHEL safety officer.

Monthly safety meeting with Site In-charges.

All Safety equipment must be ISI marked & checked by Safety officer before use.

Tag system for erection & use of scaffoldings.

Bamboo/ wooden Scaffolding material not allowed.

LPG cylinders not allowed for gas cutting.

Good House keeping. Separate waste bins to be used for flammable & non-flammable material.

Safety awareness programs for workers by display of boards, posters, competitions, talks etc. test must be done before & at regular intervals.

Checking & tag of equipment like grinding machine, welding machine, gas cutting set etc. by supervisors before use.

**Further, the contractor is required to provide proper Safety Net System wherever the hazard of fall from height is present as per instructions of BHEL/ EIL/ HMEL Engineer at site. The safety net shall be fire resistant, duly tested and shall be of ISI mark and the nets shall be located as per site requirement to arrest or to reduce the consequences of a possible fall of persons working at different heights.**

**34.5.3 Contractor shall ensure following:**

- I. Contractor has to maintain contact with local hospital having ambulance facility, scanning & other ultra modern medical facilities required during emergency.
- II. Contractor has to ensure pre employment medical check for all staff & workers.
- III. Contractor has to ensure that adequate First Aid facilities with trained nurse are available at work site for emergency purpose. This emergency set-up should include, but not limited to, following

Male nurse (in shifts)  
Oxygen set up  
Breathing apparatus  
Eye wash facility  
Stretcher  
Trauma blanket  
Medicines

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In addition to above, BHEL has arranged ambulance at work site for emergency purpose, which can be utilized, free of cost, by contractor in case of emergency. In case, under unavoidable circumstances, if the ambulance is not available/ being used elsewhere, the contractor will have to arrange for the same as under clause 34.5.3 (I).

- 34.5.4** The Contractor shall be fully responsible for accidents caused due to him or his agents or workmen's negligence or carelessness in regard to the observance of the safety requirements and shall be liable to pay compensation for injuries. **It may be noted that non-compliance to HSE requirements will result in penal action. In case of violations of safety requirements, the Contractor shall be liable for a penalty**  
**Contractor shall submit a HSE plan as per prevailing codes/ practices as applicable to refineries and acceptable to EIL/ HMEL.**

The Contractor shall adhere consistently to all provisions of HSE requirement. In case of non compliance or repeated failure in implementation of the HSE provisions BHEL/ EIL/ HMEL may impose stoppage of work without any cost & time implication to the Owner and/ or impose a suitable penalty. The amount of penalty to be levied shall be up to cumulative limit of 0.2% of the contract value limited to ceiling of Rs 1,00,00,000/-.

The amount of penalty applicable on different types of HSE violations is specified below:

SL.No Violation of HSE norms	Penalty Amount
1. For not using PPE	Rs. 250/- per day/ Item/ Person
2. Working without Work Permit/ clearance	Rs. 5,000/- per occasion
3. Unsafe Electrical	Rs. 3,000/- per item/ day
4. Working at height without full body harness using on Standard/ rejected scaffolding and not arranging fall protection arrangement as Required like Safety Nets.	Rs. 3,000/- per case per day
5. Unsafe handling of compressed gas cylinders (No trolley, jubilee clips double gauge regulator, Improper storage/ handling.)	Rs.100/- per item per day
6. Use of domestic LPG for cutting purpose.	Rs.1,000/- per occasion
7. No fencing/ barricading of excavated areas	Rs.1,000/- per occasion
8. Not providing shoring/strutting/proper slope and not keeping the excavated earth at least 1.5 M away from excavated area	Rs. 5,000/- per occasion
9. Non display of caution board, list of hospitals, emergency services available at work location.	Rs. 500/- per occasion
10. Traffic rules violation	Rs.1,000/- per occasion
11. Failure to maintain safety records by contractor safety person.	Rs.1,000/- per month

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- |     |  |  |
|-----|--|--|
| 12. | Failure to conduct daily site inspection, HSE  | Rs.1,000/- per month   |
| 13. | Failure to submit the monthly HSE report by 5th of subsequent month to Engineer-In Charge.<br>And  | Rs. 5,000/- per occasion<br>100/- per day for further delays |
| 14. | Poor House Keeping   | Rs. 1,000/- per occasion                                     |
| 15. | Failure to report & follow up accident (including near miss) reporting system.   | Rs. 10,000/- per occasion                                    |
| 16. | Degradation of environment (not confining toxic spills, spilling oil/lubricants onto ground.   | Rs. 1,000/- per occasion                                     |
| 17. | Not medically examining the workers before allowing them to work at height, not providing ear muffs while allowing them to work in noise polluted areas , made them to work in air polluted areas without respiratory protective devices, etc.   | Rs. 1,000/- per occasion                                     |
| 18. | Violation of any other safety condition as per job HSE plan, work permit and HSE conditions of contract (using crowbar on cable trenches, improper welding booth, not keeping fire extinguisher ready at hot work site, unsafe rigging practices, non-availability of First-Aid box, etc.) | Rs. 1,000/- per occasion                                     |
| 19. | Any violation not covered above.   | To be decided by<br>BHEL/ EIL/ HMEL                          |

The amount towards penalties as above will be deducted from running bills of the Contractor. The amount so collected above will be utilized for supporting the safety activities at site. The decision of BHEL/ EIL/ HMEL on above will be final and binding on the Contractor.

### **34.5.5 The contractor shall comply with following towards Social Accountability;**

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

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- f) The Contractor shall abide by the Statutory requirement of Minimum Wages Act 1948, payment of Wages Act 1936.
- g) The Contractor shall arrange potable drinking water to its employees & workers.
- 34.5.6 In order to meet the environmental concerns it is expected that the contractor shall plant, protect and maintain at least **100 trees** or equivalent in the vicinity of the project as per the available space and as per the advice of Engineers.
- 34.5.7 Guidelines for Establishing Labour camps by Construction Contractors at Guru Gobind Singh Refinery, Bhatinda.

Construction Contractors to ensure the following, but not limited to the same, for the labour campus to be established, operated & maintained by them in connection with contracts with GGSRL:

1. Dwelling            Height of roof – Minimum 10 feet  
                          Type of roof & supporting - Truss supported  
                          Brick work & cement mortar of  
                          With mud mortar & cement pointing.
2. Minimum area for room            5.0 \* 4.5 M (16 rooms in a block)  
  4 blocks with common facilities in 1 acre  
  (approx. 63 Sq. M per dwells)
3. Electric power – through PSEB or DG Set
4. Drinking water & service water
5. Separate toilet blocks for male & female with septic tank & soak pit.
6. Kitchen – proper drainage of the area
7. Camp to have enclosure – boundary wall/ fencing
8. Separate enclosure for bachelor status
9. Crutch – shelter & open play ground
10. Medical facility – periodic health check-up & as required.
11. Flooring details

\* Contractor to organize regular inspection of sanitation in the camp

**35.0 PRELIMINARY WORKS**

- 35.1** The contractor shall, as a first field activity check the foundations for turbine, generator and all auxiliaries for the correctness of the same as per the drawings and satisfy himself in all aspects. He should ensure location of foundations, their consolidation, absence of voids, levels, correctness of bolt holes, pockets levels and centrelines etc. All measurements should be recorded and submitted to Engineer for approval before erection
- 35.2** Before starting erection job, contractor shall ensure that GT/ STG area is sufficiently enclosed against ingress of dust and water, and all debris have been cleared off from the floor to a designated area as per instruction of Engineer. The contractor shall arrange to get the working area and surroundings cleaned daily to ensure a dust free atmosphere for working.
- Contractor shall first cover all openings on operating floor and put temporary hand railings on all sides of the floor to avoid any accident to the personal working. Material for above work, if available can be issued from BHEL on returnable basis.

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- 35.3** The contractor shall provide his tool stores for special tools and instruments at a convenient location near to the place of working in GT/ STG hall. Necessary area shall be provided to contractor by BHEL. This is to be cleared after completion of the work. If so required he will have shift the same if required to give fronts to other agencies engaged at site.
- 35.4** The contractor shall set up longitudinal and transverse axes and two or more level bench marks accurately on GT/ STG floor. BHEL Engineer shall certify these. The certified GT/ STG-Centre lines and datum level shall be the reference for TG and all auxiliaries' erection and alignment work. The contractor shall transfer these axes to all the floors to facilitate further execution.
- 35.5** All matching surfaces of components shall be well cleaned with cleaning agent and burrs shall be removed by filing and blue matched wherever required. Wherever necessary sealing/ lubricating/ anti-seize compounds shall be applied as per recommendation of Engineer. Machining/ grinding required for fitting of keys, pins, packers & dowels etc. shall be carried out by contractor at his cost. The contractor is expected to have his own arrangements for machining activities.
- 35.6** The accuracy of all equipment/ instruments and their functioning shall be established before they are permitted for use on the job. If the Engineer doubts the accuracy of the precision tools, any time during erection, the contractor shall arrange the checking/ calibration of tools/ equipment/ instruments at his cost.
- 36.0 CIVIL WORKS, FOUNDATIONS AND GROUTING.**
- 36.1** BHEL/ HMEL shall provide all equipment foundations. For the correctness of these foundations as per drawings, the contractor shall check the dimensions & locations of the foundations, pockets, anchor-bolt pitch. Further, top elevation of foundations shall be checked with respect to benchmark. All minor adjustments of foundation level, dressing and chipping of foundation surfaces up to 50 mm, enlarging the pockets in foundations etc., as may be required for the erection of equipment/ plants shall be carried out by the contractor.
- 36.2** While on the job, care is essential to avoid too much chipping and resultant lowering of level. In case of excess chipping, contractor has to arrange additional packing plates as per requirements provided BHEL Engineer allows it. When required by manufacturers, the embedded sub-sole plates shall be scraped and checked with Prussian blue to get the required contact with frames.
- 36.3** The contractor shall ensure perfect matching of packer plates including machining, scraping and blue matching with foundation by dressing the foundation, as well as perfect matching between the packer plates and the base plate of equipment to the satisfaction of BHEL Engineer. If required the packer plates may have to aligned and fixed on the foundations using special high strength, non-shrinking and quick-setting grouts. The minimum thickness below the packer plate should be 20 mm. The material required for this has to be arranged for by the contractor at his cost.
- 36.4** **Complete grouting of structures, equipments, including anchor/ foundation bolts, beneath base, base hollows etc. as may be applicable, is not included in the scope of contractor.** Cleaning of foundation surfaces, pocket holes and anchor bolt pits and de-watering and making them free of oil, grease, sand and other foreign materials by soda washing, water washing, compressed air and other approved methods, are within the scope of this specification/ work.  
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.
- 36.5** The contractor shall check and verify the alignment of equipment, alignment of shafts of rotating machinery, the slopes of all bearing pedestals, centring of rotors with respect to

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their sealing bores, couplings etc. as applicable and the like items to ensure that no displacement had taken place during grouting. The values recorded prior to grouting shall be used during post grouting check up and verifications. Such pre and post grout records of alignment details shall be maintained by the contractor in a manner acceptable to the Engineer.

**36.6** Besides grouting as above, any civil works required for safe and efficient operation of tools and tackles like grouting/ excavation/ casting of foundation/ anchor points for derricks, winches, guy ropes fastening, etc./ foundations required for chemical cleaning pumps, tanks and any other temporary supports shall also be the contractor's responsibility. For these civil works all materials including cement and required facilities will have to be arranged by contractor at his own cost.

**37.0 CONSUMABLES**

**37.1** The contractor shall provide within finally accepted price, all consumables like all welding electrodes (including alloy steel and stainless steel), filler wires, TIG wires, all gases (inert, welding, cutting), soldering material, dye-penetrants, radiography films. Other erection consumables such as tapes, jointing compound, grease, mobile oil, M-seal, Araldite, petrol, CTC/ other cleaning agents, grinding and cutting wheels are to be provided by the contractor. Steel, H&S, packers, shims, wooden planks, scaffolding materials hardware items etc required for temporary works such as supports, scaffoldings are to be arranged by him. Sealing compounds, gaskets, gland packing, wooden sleepers, for temporary work, required for completion of work except those which are specifically supplied by manufacturing unit are also to be arranged by him.

**37.2** All the shims, gaskets and packing, which go finally as part of equipment, shall be supplied by BHEL free of cost.

**37.3** It shall be the responsibility of the contractor to plan the activities and store sufficient quantity of consumables. Non-availability of any consumable materials or equivalent suggested by BHEL cannot be considered as reason for not attaining the required progress or for additional claim.

**37.4** It shall be the responsibility of the contractor to obtain prior approval of BHEL/ EIL/ HMEL, regarding suppliers, type of electrodes etc before procurement of welding electrodes/ TIG Filler wire. On receipt of electrodes at site these shall be subjected to inspection and approval by BHEL/ EIL/ HMEL. The contractor shall inform BHEL details regarding type of electrodes, batch number, date of expiry etc and produce test certificate for each lot/ batch with correlation of batch/ lot number with respective test certificate. No electrode without a valid test certificate will be used. Further any test if required at site regarding Filler wire and Welding electrodes, the cost of testing will be in the scope of the Contractor.

**37.5** BHEL reserves the right to reject the use of any consumable including electrodes, gases, lubricants/ special consumables if it is not found to be of the required standard/ make/ purity or when shelf life has expired. Contractor shall ensure display of shelf life on consumable wherever required and records maintained.

**37.6** Storage of all consumables including welding electrodes shall be done as per requirement/ instruction of the Engineer by the contractor at his cost.

**37.7** In case of improper arrangement for procurement of any consumable, BHEL reserves the right to procure the same from any source and recover the cost from the Contractor's first subsequent bill at market value plus the departmental charges of BHEL from time to time (30% at present). Postponement of such recovery is normally not permitted. The decision of Engineer in this regard shall be final and binding on the Contractor.

**37.8** All lubricants and chemicals required for cleaning, pre-commissioning, commissioning, testing, preservation and lubricants for trial runs of the equipment shall be supplied by BHEL/ BHEL's client. All services including, transportation, labour and T&P will be provided by the contractor for handling, filling, emptying, refilling etc. the consumption of

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lubricants/ chemicals shall be properly accounted for. Surplus material if any shall be properly stacked/ packed and returned to BHEL/ CUSTOMER stores at no extra cost to BHEL. Recoveries shall be affected for the wastage by the contractor.

- 37.9** Transportation of oil drums, from stores, filling of oil and filling of oil for flushing, first filling of oil and subsequent changeover or topping/ making up till the unit is fully commissioned and handed over to customer is included in scope of this contract. The contractor shall have to return all the empty drums to BHEL/ BHEL's client store at no extra cost. Any loss/ damage to above drums shall be to contractor's account.
- 37.10** Special consumables that are required for final box up like anti-seize compounds, jointing compound and sealing compound shall be provided by BHEL. However, the contractor shall use them to the satisfaction of BHEL Engineer.
- 37.11** All charges on account of Octroi, terminal or sales tax and other duties on materials obtained for the works from any source shall be borne by the contractor.

**38.0 TOOLS AND PLANTS/ IMTE's**

- 38.1** T&P and IMTEs being provided by BHEL as per Annexure-IV to sub-contractor free of hire charges shall be shared by other subcontractors working for BHEL at site and the allotment done by BHEL Engineer shall be final and binding.
- 38.2** Besides the T&Ps and IMTEs being made available to contractor, free of hire charges by BHEL, all other T&Ps and IMTEs required for successful and timely execution of the work covered within the scope of this tender, shall be arranged and provided by the contractor. Indicative lists of T&Ps and IMTEs to be arranged by the contractor are given as per Annexure-V & VI. He should ensure that these are in good in working condition. In the event of the failure of contractor to bring necessary and sufficient T&Ps/ and IMTEs, BHEL will be at liberty to arrange the same at the risk and cost of contractor and hire charges with overheads as applicable shall be deducted from contractor's bill. Decision of BHEL in this regard shall be final and binding on contractor.
- 38.3** All distribution boards, connecting cables, wire ropes, hoses, pipes etc., including temporary air/ water/ electrical connections etc shall have to be arranged by the contractor at his own cost.
- 38.4** In case of non-availability of the T&Ps to be provided by BHEL due to breakdown, major overhauls, distribution pattern or any other reason, the contractor shall plan/ amend/ alter his activities to meet erection/ commissioning targets in consultation with BHEL.
- 38.5** The operation of all BHEL's cranes being provided free of hire charges shall be in the scope of the contractor. The contractor shall arrange, at his own cost, trained operators and fuel and other minor consumables (i. e. cotton cloth/ cotton waste etc.) for their operation. Further, Helpers and fuel for operation of all BHEL cranes shall be provided by contractor within the final accepted rates).  
All Lubricants for the BHEL cranes such as Mobil oil, gear oil, brake oil, hydraulic oil, torque converter oil and grease will be provided by BHEL free of cost. The contractor will give the requirement well in advance.
- 38.6** The contractor shall engage trained and experienced operators for the operation of BHEL's T&Ps. Their skill/ performance will be checked by BHEL Engineer before they are allowed to operate the same. However checking of skills by BHEL does not absolve the contractor of his responsibilities for proper and safe handling of equipment, consistent good performance of operators and regular performance evaluation of operators.
- 38.7** The day to day operation and maintenance of BHEL's T&Ps (Other than cranes) shall be carried out by contractor as per manufacturer's/ BHEL's maintenance schedule at his cost. The contractor shall arrange, at his own cost, trained operators, fuel and other consumables for their operation. The contractor shall arrange at his cost all spares needed for upkeep of huck bolting machine, DG Set, Induction Machine and Hydraulic Test pumps supplied by BHEL. For upkeep of all other T&Ps supplied by BHEL, spares shall be arranged by the Contractor. BHEL supplied T&Ps shall be maintained in good

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working condition during the entire period of use. T&Ps in defective/ damaged condition shall be rectified promptly to the full satisfaction of BHEL engineer. Contractor shall maintain records for maintenance of major T&Ps. These shall be made available for Inspection whenever required. In case of any lapses on the part of the contractor, BHEL at its own discretion get the servicing/ repair of equipment done at the risk and cost of the contractor with BHEL overheads. Further, if there are breakdowns/ damages due to negligence of the contractor, the complete service/ repair charges and cost of all the spares damaged with BHEL overheads shall be recovered from contractor's RA bills.

- 38.8** Maintenance of BHEL cranes (100 MT and above), will be carried out by a separate agency appointed by BHEL. However, the helpers for day today maintenance and fuel for these cranes shall be in the scope of this contract.

For Maintenance of BHEL cranes (less than 100 MT), while these shall be covered under AMC awarded by BHEL, the contractor at his own cost shall arrange all supervision and labour required for routine/ day-day maintenance of cranes. For attending breakdowns of these cranes, the contractor shall arrange for labour. A separate maintenance group to be formed by the contractor for the day today maintenance of all the T&Ps working at site. However specialist's supervision, for attending breakdowns shall be arranged by BHEL as assessed by BHEL Engineer. Repair of self and dynamo shall be the responsibility of the contractor. The cranes shall be fitted with a set of new batteries at the time of initial issue from the stores. However, the charges of the replacement of the other damaged/ worn out parts of BHEL cranes will be borne by BHEL, provided the damage is not due to the negligence of the contractor.

All the spares & lubricants (except for diesel) for the cranes (BHEL's Cranes) shall be supplied by BHEL. For all BHEL cranes, if there are breakdowns/ damages due to negligence of the contractor, the complete service/ repair charges and cost of all the spares damaged with BHEL overheads shall be recovered from contractor's RA bills.

- 38.9** The contractor, at his own cost shall arrange all supervision and labour required for maintenance and attending breakdowns.

- 38.10** Increasing/ shortening of the crane boom to suit work requirements shall have to be arranged by the indenting contractor at his cost. All necessary manpower tools, support, consumables, illumination etc. will have to be arranged by contractor at his cost. If required, contractor has to return the crane with original boom.

- 38.11** The area and infrastructure development of the area to be carried out by the customer. However in construction projects of this magnitude it is possible that all the areas/ approaches may not be ready. In such cases consolidation of ground and arrangement of sleepers/ sand bag filling etc for safe operation/ movement of equipment including cranes/ trailers etc shall be the responsibility of the contractor at his cost. No compensation on this account shall be payable.

- 38.12** In the event of contractor not using and maintaining BHEL T&Ps according to BHEL's instructions. BHEL will have the right to withdraw such item without any notice and no claim in this regard shall be entertained and contractor shall be responsible for delay in execution on this account.

- 38.13** The contractor has to maintain a logbook and shall furnish regular maintenance and utilization report of the BHEL T & Ps under his possession, as per requirement of BHEL.

- 38.14** Any loss/ damage to any part of BHEL T&Ps and IMTEs shall be to the contractor's account and any expenditure on these accounts by BHEL will be recovered from the contractor's bill in case the contractor fails to make good the loss.

- 38.15** It shall be responsibility of the contractor to take delivery of T&Ps from stores or place of use by other contractor at project site, transport the same to site and return the same to BHEL store/ place as intimated by Engineer in project site in good working conditions after use.

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- 38.16** The contractor shall return BHEL T&Ps and IMTEs issued to him in good working condition as and when desired by BHEL (on completion or reduction of workload). If contractor delays return of T&P and IMTE, hire charges as applicable shall be levied by BHEL from time, it was requisitioned till the time of actual return. *Hire charges shall also be charged on the T&Ps and IMTEs returned in damaged/ unserviceable condition to BHEL till their satisfactory repair.* T&Ps & IMTEs returned in damaged/ unserviceable condition shall be got repaired by BHEL at its own discretion and entire cost of repair with BHEL overheads shall be recovered from the contractor.
- 38.17** Replacement cost including BHEL overheads in respect of irreparable/ completely damaged/ non return of T&Ps and IMTEs shall be recovered from the contractor's running/ final bills
- 38.18** EOT crane(s) as if available in the TG hall shall be provided to the contractor. The crane may be provided with a trailing cable that has to be handled by the contractor till the charging of the down shop leads. **The contractor shall have to deploy his own operator for operating the crane under supervision of BHEL/ EIL/ HMEL.** The running/ capital maintenance of the EOT cranes is excluded from the contractor's scope. Routine maintenance like cleaning and oil topping (oil will be provided by BHEL) will be carried out by the contractor.
- 38.19** 100 MT capacity Crawler crane will be provided by BHEL free of hire charges and on sharing basis to the contractor for handling of feed storage tank and de-aerator. The operation & maintenance of BHEL 100 T crane shall be carried out by BHEL/ AGENCY. **The contractor shall provide required helpers, operator charges and fuel. Operators for other BHEL cranes have also to be provided by the contractor in addition to helpers & fuel.**
- 38.20** Contractor shall ensure deployment of serviced and healthy T&Ps including cranes, lifting tackles, wire ropes, Manila-ropes, winches and slings etc. History card and maintenance records for major T&Ps will be maintained by the contractor and will be made available to BHEL Engineer for inspection as and when required. Identification for such T&Ps will be done as per BHEL Engineer's advice.
- 38.21** Contractor shall ensure deployment of reliable and calibrated IMTEs (Inspection, Measuring and Test Equipment). The IMTEs shall have test/ calibration charges certificates from authorized/ Govt. approved/ accredited agencies traceable to National/ International standards. Each IMTE shall have a label indicating calibration status i.e. date of calibration, calibration agency and due date for calibration. A list of such instruments deployed by contractor at site with its calibration status is to be submitted to BHEL Engineer for control.
- 38.22** Re-testing/ re-calibration shall also be arranged at regular intervals during the period of use as advised by BHEL Engineer within the contract price. The contractor will also have alternate arrangements for such IMTE so that work does not suffer when the particular instrument is sent for calibration. Also if any IMTEs not found fit for use, BHEL shall have the right to stop the use of such item and instruct the contractor to deploy proper item and recall i.e. repeat the readings taken by that instrument, failing which BHEL may deploy IMTEs and retake the readings at contractor's cost.
- 38.23** BHEL shall have lien on all T&P, IMTEs & other equipment of the contractor brought to the site for the purpose of erection, testing and commissioning. BHEL shall continue to hold the lien on all such items throughout the period of contract. The contractor and/ or his Sub-contractors without the prior written approval of the Engineer shall remove no material brought to the site.
- 38.24** The **month wise T&P deployment plan** to be submitted as per format (at **Annexure D** to General Conditions of Contract) is only to assess the capability as well as understanding of the contractor to execute the work. It shall be the contractor's responsibility to deploy the required T&P, for timely and successful completion of the job, to any extent over and

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above those indicated in the above deployment plan (including those which are not covered in the plan submitted) without any compensation on this account.

**39.0 SUPERVISORY STAFF AND WORKMEN**

**39.1** The contractor shall deploy all the skilled workmen like millwright fitters, Pipe Fitters, HP welders, Structural welders, crane-operators, drivers, gas cutters, riggers, sarangs, masons, carpenters, electricians, helpers and instrument technicians to carry out the works as per specifications. In addition to skilled, semi-skilled and unskilled workmen required for all the works, suitable workmen required for handling and transporting of equipment from site storage to erection site, erection, testing and commissioning as contemplated under this specification shall be deployed. Only fully trained and competent men with previous experience on the job shall be employed. They shall hold valid certificates wherever necessary.

BHEL reserves the right to decide on the suitability of the workers and other personnel who will be deployed by the contractor. BHEL reserves the right to insist on removal of any employee/ workman of the contractor at any time, if they find him unsuitable. The contractor shall remove him forthwith.

**39.2** The supervisory staff including qualified Engineers deployed by the contractor shall ensure proper out-turn of work and discipline on the part of the labour put on the job by the contractor. They should in general see and ensure that the works are carried out in a safe and proper manner and in coordination with other labour and staff deployed directly by BHEL or other contractors of BHEL or BHEL's client/ other agency.

**39.3** The work shall be executed under the usual conditions affecting major power plant construction and in conjunction with numerous other operations/ activities at site. The contractor and his personnel shall cooperate with other personnel/ contractors, coordinating his work with others and proceed in a manner that shall not delay or hinder the progress of work as a whole.

**39.4** The contractor's supervisory staff shall execute the work in the most substantial and workman like manner in the stipulated time. Accuracy of work and aesthetic finish are essential part of this contract. The contractor shall be responsible to ensure that assembly and workmanship conforms to the dimensions and tolerances given in the drawings/ documents/ instructions given by BHEL Engineer from time to time.

**39.5** The contractor shall deploy the necessary number of qualified and approved full time electricians at his cost to maintain his temporary electrical installation till the completion of work.

**39.6** It is the responsibility of the contractor to engage his workmen in shifts or on overtime basis for achieving the targets set by BHEL and also during the period of commissioning and testing of unit. The contractor's finally accepted rates/ prices shall include all these contingencies.

**39.7** During the course of erection,  
If the progress is found unsatisfactory,  
If the target dates fixed from time to time for every mile stones are to be advanced/ not being met,  
if it is found that the skilled workmen like fitters, Welders, operators, technicians etc deployed are not sufficient,

BHEL after giving reasonable opportunity to the contractor will induct on the work the required workmen in addition to contractor's workmen to improve the progress. The expenses so incurred will be recovered from the contractor's bills with overheads.

**39.8** If the contractor or his workmen or employees shall break, deface, injure or destroy any part of a building, road kerbs, fence, enclosure, water pipes, cables, drains, electric/ telephone poles, wire, trees or any other property or to any part of erected components, the contractor shall make the same good at his own expense. In default, BHEL may cause

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the same to be made good by other workmen or by other means and deduct the expenses from any money due to the contractor. BHEL's decision will be final and binding.

- 39.9** Though every endeavour shall be made to ensure that all plant materials are supplied as per schedule. However in a job of this kind it is possible that some materials may be delayed. In order to achieve the ultimate targets, the contractor may have to augment his manpower and resources. No compensation on this account shall be admissible.
- 39.10** The month wise manpower deployment plan to be submitted as per format (at Annexure-C to general conditions of contract) is only to assess the capability as well as understanding of the contractor to execute the work. It shall be the contractor's responsibility to deploy the required manpower, for timely and successful completion of the job, to any extent over and above those indicated in the above deployment plan (including those which are not covered in the plan submitted) without any compensation on this account. The contractor shall identify separate persons at site for quality control and safety.
- 39.11** The Contractor has to ensure deployment of qualified Level-2 NDT Engineer and Welding Engineer exclusively for the welding works envisaged under the Package works.

### **40.0 MATERIAL HANDLING AND STORAGE**

- 40.1** All the equipment furnished under this contract shall be received from the project stores, sheds/ storage yards and transported to pre assembly area/ erection site and stored in the storage spaces in a manner so that they are easily retrievable till the contractor erects them. While drawing/ lifting material from BHEL/ customer stores, contractor shall ensure that the balance/ other materials are stacked back immediately.
- 40.2** While BHEL will endeavour to store/ stack/ identify materials properly in their open/ close/ semi closed/ tarpaulins covered storage yard/ shed, it shall be contractor's responsibility to assist BHEL in identifying materials well in time for erection. They should take the delivery of the same, following the procedure indicated by BHEL, and transport the material safely to pre-assembly yard/ erection site in time, according to program.
- 40.3** The contractor shall take delivery of components/ equipment from storage area after getting the approval of BHEL Engineer on standard indent forms. It shall be contractor's responsibility to assist BHEL in identifying materials well in time for erection, taking delivery of the same, following the procedure indicated by BHEL, and transport the material safely to pre-assembly yard/ erection site in time, according to programme. While drawing/ lifting material from BHEL/ customer stores, contractor shall ensure that the balance/ other materials are stacked back immediately at no extra cost to BHEL. Some of the consignment may have to be unloaded in the assembly area and at or near erection site directly from truck/ trailer, the procedure for handling this material too will be same as for the material received in stores and as advised by BHEL Engineer.
- 40.4** The contractor shall identify and deploy necessary Engineers/ supervisors/ workmen for the above work in sufficient number as may be needed by BHEL, for areas covering their scope.
- 40.5** All the equipment shall be handled very carefully to prevent any damage or loss. No untested wire ropes, slings, lifting equipment, d-shackles, dog-clamps, eye-bolts shall be used for unloading/ handling. The equipment shall be properly protected to prevent damage either to the equipment or to the floor where they are stored. The equipment from the stores shall be moved to the actual location at the appropriate time so as to avoid damage of such equipment at site.
- 40.6** Contractor shall ensure that while lifting slings shall be put over the points indicated on the equipment or as indicated in the manufacturer's drawings. Slings/ shackles of proper size shall be used for all lifting and rigging purposes. All care shall be taken to safe guard the equipment against any damage. Dragging of piping/ valves should be avoided. In case of any damage the cost shall be covered from the contractor.

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- 40.7** Approach road conditions from the stores/ yards to the erection site may not be equipped and ideal for smooth transportation of the equipment. Contractor may have to be adequately prepared to transport the materials under the above circumstances without any extra cost.
- 40.8** Contractor shall be responsible for examining all the plant and materials issued to him and notify the Engineer immediately of any damage, shortage, discrepancy etc before they are moved out of the stores/ storage area. The contractor shall be solely responsible for any shortages or damages in transit, handling, storage and erection of the equipment once received by him. As the erection work will be spread in different areas/ locations of the project, contractor has to arrange sufficient number of watch/ ward personal to avoid any pilferage of material. As per General Conditions of contract under provisions of clause No 29 BHEL will reserve the right to recover the cost of repair/ replacement, if any, to bring back the equipment in original order, in case the equipment/ material is lost/ damaged while in the custody of the contractor. BHEL's decision in this regard shall be final and binding on the contractor.
- 40.9** The contractor shall maintain an accurate and exhaustive record, detailing out the list of all equipment received by him for the purpose of erection and keep such record open for the inspection of the engineer at any time.
- 40.10** All the material in the custody of contractor and stored in the open or dusty locations must be covered with suitable weather proof/ fire retardant covering material wherever applicable and shall be blocked up on raised level above ground. All covering materials including blocks and sleeper shall be arranged by the contractor at his cost.
- 40.11** If the material belonging to the contractor are stored in area other than those earmarked for his operation the engineer will have the right to get it moved to the area earmarked for the contractor at the contractors risk and cost.
- 40.12** The contractor shall be responsible for making suitable indoor storage facilities to store all equipment (drawn by the contractor from BHEL/ customer stores), which require indoor storage till the time of their installation. The Engineer will direct the contractor in this regard, which item in his opinion will require indoor storage, and the contractor shall comply with Engineer's decision.
- 40.13** The contractor shall ensure that all surplus/ damaged/ scrap/ unused material, packing wood/ containers/ special transporting frames etc are returned to BHEL at a place in project area identified by the Engineer. The contractor will maintain an account for all items received and returned to BHEL. Any shortage in returning such items shall be chargeable to the contractor except for a 5% allowable against wastage for packing wood only.
- 40.14** The contractor shall hand over all parts/ materials remaining extra over the normal requirement with proper identification tags to the stores as directed by the concerned BHEL engineer.
- 40.15** The contractor shall ensure that all the packing materials and protective devices installed on equipment during transit and storage are removed before installation.
- 40.16** It shall be the responsibility of the contractor to keep the work/ storage areas in neat, tidy and working conditions. All surplus/ unusable packing and other materials shall be removed and deposited at location(s) specified by BHEL within the project premises. If required weighing of the same within the project premises will have to be carried out.
- 40.17** Contractor shall also ensure that for lifting rotors from the casing, only rotor lifting tackle supplied by the manufacturer is used as per the instruction given and on one side of the sling turn buckle of required size shall be used and rotor shall be lifted slowly only when it is in perfect level. Contractor shall ensure that the sling points on the rotor are as per the instructions of the manufacturer given in the drawings and he shall ensure that rubber or leather pads are given between the sling and rotor shaft to avoid any damage, scratches/ nicks on the rotor shaft. Under no circumstance shall the contractor put his slings around journal shaft or shall lift the rotor till it is fully balanced.

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Contractor shall ensure that all rotors when removed from package/ casing are placed over suitable stands and supported at the points as shown in the drawings. Contractor shall cover the journals of the rotors with grease and cloth, and also cover the rotor with cloth tarpaulin to avoid any damage to the rotor blades. The rotors shall be kept in a place, which is safe from falling objects and away from main passages.

**40.18** For unloading, turning & lifting stator to the TG floor level and placing of stator on its foundation the contractor shall strictly comply with the instructions of the BHEL Engineers.

### **41.0 PRESERVATION OF COMPONENTS**

**41.1** After taking delivery from BHEL/ customer's stores, plant materials storage shall be subjected to the following protection besides other provisions indicated in these specifications elsewhere.

Items stored outdoors shall be blocked up at least six inches (150 mm) off the ground.

Motors, valves, electrical equipment, control equipment and instruments etc shall be stored indoors in a warehouse to be provided by the contractor. Motor windings shall be kept dry by use of external heat or space heaters.

Bearings and other wearing surfaces of plant materials shall be protected against corrosion and kept clean.

Insulation materials shall be stored indoors or otherwise protected against getting wet.

**41.2** It shall be the responsibility of the contractor to apply preservatives/ touch up paints (primer) on equipment handled and erected by him till such time of final painting. It shall be contractor's responsibility to arrange for required paints (primer), thinners, labour, scaffolding materials, cleaning materials like wire brush, emery sheets, etc, cleaning of surface and provide one coat of preservatives/ paints (primer) from time to time as decided by BHEL engineer. The accepted rate shall include this work also. It is to be noted that such painting may have to be done as and when required till such time the final painting is carried out.

**41.3** The contractor shall effectively protect the finished work from action of weather and from damage or defacement and shall cover the finished parts then and there for their protection.

**41.4** Any failure on the part of contractor to carry out works according to above clauses will entail BHEL to carry out the job from any other party and recover the cost from contractor.

### **42.0 CLEANING OF EQUIPMENTS**

**42.1** The contractor shall thoroughly clean all the components before installation. The components whose surfaces are coated with protective coating and sent to site are to be thoroughly cleaned by suitable mechanical/ chemical means as per the approved procedures.

**42.2** Contractor shall ensure that turbine cylinders, rotors, pedestals, diaphragms, glands, packing rings, etc. shall be cleaned with kerosene, petrol, approved solvents or and carbon tetra chloride before assembly and erection of the equipment. For cleaning purposes he shall use only soft cotton cloth. Contractor shall never use cotton waste for cleaning any TG equipment. Generator and other electrical equipments before erection shall be cleaned with dry air/ vacuum cleaner.

**42.3** The contractor shall clean inside of all pipes and fittings from dirt, sand and loose scales, mechanically and by air blowing before being erected. All pipelines shall be thoroughly blown and/ or flushed. If necessary certain pipelines may have to be cleaned by acid pickling/ chemical cleaning. The procedure for the same shall be provided by BHEL. However, all chemicals and inhibitors shall be provided by BHEL free of cost. Disposal of chemical has to be carried out by the contractor at his own cost as per advice of the engineer. Surface cleaning of pipes will require shot blasting before applying primer & paints.

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**43.0 ERECTION**

- 43.1** All normal erection and assembly techniques necessary for completion of works under this specification and magnitude have to be carried out. It is not possible to specifically list out all of them. Absence of any specific reference will not absolve the contractor of his responsibility for the particular operation. These would include, Scaffolding and rigging operations, Machine/ flame/ electric cutting, grinding, welding, radiography and stress relieving  
Fitting, fettling, filing, straightening, chamfering chipping, scrapping, reaming, as cleaning, checking, levelling, blue matching, aligning and assembly.  
Machining, surface grinding, drilling, doweling, shaping.  
Temporary erections for alignment, dismantling of certain equipment for checking, cleaning, servicing and site fabrication.
- 43.2** Any fixtures, scaffolding materials, approach ladder, concrete block supports, steel structures required for temporary supporting, pre-assembly or checking, welding, lifting and handling during pre-assembly and erection shall be arranged by contractor at his cost.
- 43.3** No members of any ladder/ structure/ platform should be cut without specific approval of BHEL. In case it is necessary to cut, the contractor shall rectify/ repair in a manner acceptable to BHEL/ customer without any additional cost.
- 43.4** The contractor shall erect scaffolding/ temporary platforms for erection. These should be of adequate capacity and shall never be over loaded. These should be replaced when not found suitable during erection work and dismantled on work completion & removed from work site.
- 43.5** Corrections like straightening of ladders, tube support plates adjustment/ removal of ovalates in pipes and opening or closing the fabricated bends of piping to suit the layout shall be considered part of the work and the contractor is required to carry out such work within finally accepted price/ rate as per instructions of Engineer.
- 43.6** The contractor shall carry out assembly and erection of condenser components normally on the condenser foundation directly. This includes  
Assembly and welding of bottom plate, side plates, hot well, springs and steam throw device.  
Complete fabrication and welding of shell out of loose side-walls dome walls, and stand pipes.  
Assembly and welding of water chambers and water-boxes.  
Assembly and welding of support plates, baffles and stiffening structure,  
Tubes insertion, expansion and cutting/ trimming.  
Hydraulic test and water fill test and any other fitting/ assemblies required to complete the assembly.
- 43.7** The contractor shall carry out the condenser tube insertion and expansion at site after the installation of condenser on its foundation. Condenser tubes shall be handled strictly as per instructions of BHEL Engineer. Before installation of tubes, the contractor shall check for any dents, mechanical damages or any other defects of tubes caused during storage. These should be thoroughly internally and externally cleaned for all extraneous matter as per the directions of the engineer.
- 43.8** Before insertion of tubes, the contractor shall clean the surface of the holes in the main tube plates and tube support plates for paint, corrosion spots oxide scale etc. as per the instructions of the engineer. Even reaming of support plates if required for smooth insertion of tubes is to be carried out by contractor at his cost and reaming and its arrangement is to be arranged by contractor.  
The contractor shall carry out the tube insertion & expansion of the condenser strictly in accordance with the instructions issued by the engineer. Tubes may require adjustment of length on both ends. The contractor shall ensure to provide covering above the top row of

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tubes to avoid any damage to the tubes prior to tube insertion as per instruction of BHEL Engineer at his cost.

- 43.9** The contractor shall carry out the condenser neck welding with casing only after final installation of casing. However the contractor shall adjust the gap between condenser neck and LP exhaust hood uniformly by suitably lifting the condenser as directed by engineer. Also the makeup pieces required for this purpose shall be fabricated and welded to the dome walls by the contractor.
- 43.10** Some of the rotating equipment and electrical motors are provided with protective greases only. Contractor shall arrange for cleaning of the same with petrol or some other reagent. If necessary, dismantling some of the parts of the equipment would be necessary. He shall arrange for re-greasing/ lubricating them with recommended lubricants and for assembling back the dismantled parts, at quoted rate. Lubricants will, however, be supplied free of cost by BHEL.
- 43.11** All rotating machines and equipment shall be cleaned, lubricated, checked for their smooth rotation, if necessary by dismantling and refitting before erection. If, in the opinion of Engineer, the equipment is to be checked for clearance, tolerance at any stage of work or during commissioning period, all such works are to be carried out by contractor at his cost.
- 43.12** All the shafts of rotating equipment shall be properly aligned to those of the matching equipment to as perfect and as accurately as practicable. All bearings, shafts and other rotating parts shall be thoroughly cleaned and suitably lubricated before starting.
- 43.13** All the motors and equipment shall be suitably doweled after alignment of shafts with tapered/ parallel machined dowels. The contractor at his own cost shall arrange for the machining of dowel pins required for the same. However the materials for dowel pins shall be issued by BHEL free of cost.
- 43.14** The bearings shells will be blue matched at site and checked for bearing clearances. The contractor shall carry out scraping of bearing housing, if required to any extent. No extra claim for blue matching of any two surfaces up to 1mm initial gap will be entertained. The contractor shall also check air gap and adjustment of stator/ rotor to magnetic centre shall be carried out as part of erection.
- 43.15** The contractor shall fabricate and weld pipes, special bends, as required for installing lube oil systems. The contractor shall also service the lube oil system and carry out the hydraulic test of oil coolers and piping systems as required.
- 43.16** The contractor as part of the scope of work if required or if directed by BHEL shall carry out the servicing and realignment of skid-mounted equipment.
- 43.17** All electrical panels, control gears, motors and such other devices shall be properly dried by heating to improve IR value, before they are installed and energized. Bearings, slip rings commutators and other exposed parts shall be protected against ingress of moisture and corrosion during storage and periodically inspected.
- 43.18** The contractor shall completely erect and test all the piping systems including their hangers, supports, valves, insulation, and accessories including sampling lines and coolers as per specifications and drawings. The services will include Fabrication, welding, pre-heating, stress relieving, bolting, testing, cleaning insulation, shot blasting and painting. System shall be demonstrated in condition to operate continuously in a manner acceptable to the Engineer. Welding shall be used throughout for joining pipes except where flanged screwed or other type joints are specified or shown on the drawings. All piping shall be erected true to the lines and elevation as indicated in the drawings
- 43.19** **Most of the pipes shall be supplied un-fabricated in running lengths without beveling. It shall be responsibility of contractor to carry out fabrication by cutting to size, bevel/ prepare edges, fabricate support pads, drill holes for drains, vents and other stubs, welding, carryout NDT & SR as per site requirement & as directed by BHEL.** Pipes sent in standard length shall be cut to suit the site conditions and the layouts. Tubes or pipes wherever deemed to be convenient will be sent in running lengths

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with sufficient bends. Bends upto 80 mm NB will be fabricated at site wherever required. Adjustments like removal of ovality in pipes and opening or closing the fabricated bends of piping to suit the layout shall be considered part of the work and the contractor is required to carryout such work within the finally accepted price/ rates as per instructions of BHEL, which shall include specified heat treatment & NDT procedures etc. **In CS Piping, Mitre Bends, Reducers to be fabricated at Site from supplied pipe in 32", 34", 48", 58". All Pipes are supplied in Commercial Lengths, without edge preparation. For underground piping coal tar tape (supply & applications), fabrication of mitre bends, reducers, pipe to pipe joints is in the scope of contractor, if required. The necessary Edge preparation, cutting the Pipe spools to required lengths, welding the attachments is to be done at Site.**

- a) The contractor shall clean inside of all pipes and fittings from dirt, sand and loose scales, mechanically and by air blowing before being erected. All pipelines shall be thoroughly blown and/ or flushed. If necessary certain pipelines may have to be cleaned by acid pickling/ chemical cleaning. The procedure for the same shall be provided by BHEL. However, all chemicals and inhibitors shall be provided by BHEL free of cost. Disposal of chemical has to be carried out by the contractor at his own cost as per advice of the engineer.
  - b) The contractor shall thoroughly clean all the components before installation. The components whose surfaces are coated with protective coating and sent to site are to be thoroughly cleaned by suitable mechanical/ chemical means (with kerosene, petrol, approved solvents etc.) as per the approved procedures. For cleaning purposes he shall use only soft cotton cloth. Contractor shall never use cotton waste for cleaning any TG equipment. Generator and other electrical equipments before erection shall be cleaned with dry air/ vacuum cleaner.
  - c) All matching surfaces of components shall be well cleaned with cleaning agent and burrs shall be removed by filing and blue matched wherever required. Wherever necessary sealing/ lubricating/ anti-seize compounds shall be applied as per recommendation of Engineer. Machining/ grinding required for fitting of keys, pins, packers & dowels etc. shall be carried out by contractor at his cost. The contractor is expected to have his own arrangements for machining activities.
- 43.20** Certain adjustments in length may be necessary while erecting high-pressure pipelines. The contractor should remove the extra lengths/ add extra lengths to suit the final layout after preparing edges a fresh by adopting specified heat treatment procedures, at no extra cost.
- 43.21** It is possible that a few flanges may not be matching. The contractor shall be required to cut and re-weld the same as and when required without any additional cost.
- 43.22** The contractor shall be responsible for any modifications of shop fabricated pipes prior to installation to accommodate minor site alteration in pipe routing at no extra cost
- 43.23** All vents and drains for piping equipment covered in the scope whether shown in the drawings or not, shall be terminated outside the TG hall in atmosphere and at sump-pit as directed by the engineer.
- 43.24** Wherever piping erected by the contractor is connected to equipment/ piping erected by the other agencies the joint at the connecting point shall be the responsibility of the contractor of this specification.
- 43.25** Normally the high-pressure valves will have prepared edges for welding. But, if it becomes necessary, the contractor will prepare new edges or recondition the edges by grinding or chamfering to match the corresponding tubes and pipes. All fittings like `T' pieces, weld neck flanges, reducers etc., shall be suitably matched with pipes/valves for welding.

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- 43.26** The valves will have to be checked, cleaned or overhauled (including lapping of seat) in full or in part before erection and/ or after chemical cleaning and during commissioning. The contractor shall dismantle the valves & actuator for overhauling, servicing & lubrication wherever required as advised by the Engineer. The contractor shall also lap or grind valve seats for ensuring the satisfactory performance of valves at no extra cost.
- 43.27** The contractor shall be responsible for correct orientation of all valves so that seats, stems & hand wheels are in desired direction. It is the responsibility of the contractor to obtain the information regarding orientation of valves not fully located on drawings before the same are installed.
- 43.28** Steel for suspensions for piping, will be supplied in running lengths. These are to be cut to suitable sizes and adjusted as per requirement.  
Additional platforms and ladders of permanent nature for approaching different equipment, as per site requirement which may not be indicated in drawings shall be fabricated and installed by the contractor. However, the contractor will be paid for this work on accepted tonnage rate for erection irrespective of number of platforms. The materials required for platforms excluding consumables and T&P will be provided by BHEL, some materials for such work may have to be taken from packing materials, the contractor will be required to retrieve the same from packing materials by using gas cutting etc. at no additional cost to BHEL.
- 43.29** No temporary supports should be welded on the piping. In case of absolute necessity prior approval should be taken from BHEL Engineer. In such cases heat treatment, if required, shall be carried out by the contractor
- 43.30** All hangers, supports and anchors shall be installed as per drawing to obtain safe and reliable and complete pipe installation as per instructions of Engineer. Any additional support as called for by Engineer shall have to be fabricated and erected by the contractor. The raw materials required for fabricating such supports shall be supplied by BHEL free of cost
- 43.31** Spring suspensions/ constant load hangers may have to be pre-assembled for required load and erection carried out as per instructions of BHEL. Any adjustments, removal of temporary arrestors/ lockers etc., have to be carried out as and when required.
- 43.32** Contractor shall install piping in such a way that no excessive or destructive expansion forces exist either in the cold condition or under conditions of maximum temperature and pressure. All bends, expansion joints and any other special fittings necessary to take care of proper expansion shall be incorporated as per the advice of Engineer. During installation of expansion joints, anchors, care must be taken to see that full design movement is available at all times from maximum and minimum temperature.
- 43.33** The contractor shall carry out the tightening of the field bolts on the equipment and piping covered under this specification by using either the calibrated torque wrench method or the turn of part method. The procedure to be followed, the tools and the equipment deployed shall be subject to the approval of Engineer. All the torque wrenches shall be calibrated as per requirement and before they are put in use on any job.
- 43.34** The contractor shall ensure that all supporting elements, anchors & restraint have been installed and adjusted in accordance with the drawings/ sketches & other written instructions of the Engineer. The contractor shall inspect the hangers associated with the piping systems as follows:  
After hydraulic test, with the piping in the cold position, with all travel stops removed, with the pipe completely insulated and complete in all respect ready for start up.  
Piping in the hot position with the unit operating at the maximum load.  
Piping in the cold position during the first complete shut down.
- 43.35** The hanger assemblies shall not be used for attachment of rigging to hoist the pipes into position. Separate temporary supports shall be used to securely hold the pipe in position till pipe supports are completely assembled and attached to the building structure.

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- 43.36** Layout of small bore piping as required shall be done as per site requirement. Necessary sketch for routing these lines should be got approved from BHEL/ EIL by the contractor. There is a possibility of slight change in routing the above pipelines even after completion of erection or from aesthetic point of view. Contractor at no extra cost should carry this out.
- 43.37** Erection, testing and commissioning of power cylinders, electrically operated valves and their actuators etc. coming under various groups is covered under the scope of this specification
- 43.38** All valves, including motorised valves, flap valves, dampers and actuators, shall be serviced and lubricated to the satisfaction of Engineer before erecting the same and during pre-commissioning also. Welding or jointing of extension spindle for valves to suit the site conditions and operational facility shall be part of erection work within the quoted rates
- 43.39** The contractor shall also or grind the valve seat, if required, to ensure satisfactory performance of valves at no extra cost. All parts such as gaskets, gland packing which form the permanent part of equipment shall be supplied by BHEL free of cost.
- 43.40** Erection and welding of necessary instrumentation tapping points, thermocouple pads, thermo-wells, valves, battery of first root valves, condensing vessels, flow nozzles and control valves to be provided on TG, auxiliaries and pipe lines covered within the scope of this specification, will also be the responsibility of the contractor. The welding of all the above items will be contractor's responsibility even if the:  
Product groups, under which these items are released, are not covered in the scope of this tender.  
Items are supplied by any agency other than BHEL.

**NOTE: ADDITIONAL THERMOWELLS, AS REQUIRED FOR CONDUCTANCE OF THE PERFORMANCE GUARANTEE TEST, ARE TO BE INSTALLED BY THE CONTRACTOR.**

- 43.41** Erection of CO<sub>2</sub> and H<sub>2</sub> systems complete in all respects, including cylinders stands, connecting piping, valves, distribution headers, main control panels etc is in the scope of contractor. The delivery gas cylinders is to be taken from BHEL/ its client stores, their handling and filling of gases in the system as and when required, till unit is commissioned and handed over, shall be the responsibility of the contractor. The empty cylinders are to be returned to BHEL/its client stores.
- 43.42** After initial trial of rotating equipment, control and power cabling for motors and other equipment/ instrumentation shall have to be disconnected for checking alignment and re-setting/ re-alignment/ hot alignment. Contractor shall have to arrange for disconnecting control and power cabling as per BHEL engineer's instructions and clearance and reconnect the control and power cabling after realignment. Quoted tonnage rate shall be inclusive of the above.
- 43.43** The contractor shall carry out Kerosene oil/ dye penetration tests of all the bearing housing of turbine & generator. The Kerosene oil DPT kit for the tests shall also be arranged by the contractor at his cost.
- 43.44** All Internal cabling work (system cabling i.e. cables from local control panel to system drives/ instruments etc.) including laying of cable trays for oil centrifuge machine, gas drier On load condenser tube cleaning system, other electro-mechanical systems is in the scope of subject work.
- 43.45** Wherever cables are to be laid under the scope of subject work the same shall be laid in cable trays, dressed, properly glanded and terminated.
- 43.46** The contractor is strictly prohibited in using the TG/ GT/ Aux. Components for any temporary supporting or scaffolding works etc. In case of such misuse a sum of determined by Engineer will be recovered from contractor's bills

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- 43.47** The calibration of skid mounted instruments shall be arranged by BHEL through other agency engaged for C&I. Contractor will be informed by BHEL engineer about the details of C&I agency. The contractor shall coordinate with the C&I agency for removal, calibration and re-installation of the instruments. Though C&I agency will remove and reinstall the instruments after calibration, the contractor for this package will maintain the list of all the instruments removed & reinstalled. Instruments prior to removal and after reinstallation shall be considered in custody of the contractor for this package. All instruments such as pressure gauges/ temperature gauges, switches etc. forming part of product group (PG) are under the erection scope of this contract and shall be installed and commissioned by the contractor of this package at no extra cost to BHEL, however the calibration of these instruments shall be done by C&I agency as above
- 43.48** The Deaerator & feed storage tank will be received in 5 pieces and is to be assembled, welded, NDT and tested at site. Besides the provisions under Clause No. 38.19, all other arrangements for erection of feed storage tank and Deaerator has to be made by contractor with in their finally accepted price
- 43.49** The contractor shall assist BHEL in preparation of as built piping drawing.
- 43.50** The underground pipes if required at road crossing have to be wrapped and coated. The contractor within the quoted rates will carry out excavation backfilling wrapping coating (**Supply & Application**) and spark-testing etc. The equipments required for spark-test has to be arranged by contractor at its cost.
- 44.0 WELDING, HEAT-TREATMENT, RADIOGRAPHY AND NON-DESTRUCTIVE TESTING**
- 44.1** The pressure parts, equipment and piping shall be erected in conformity with the provisions of Indian Boiler Regulation and as may be directed by BHEL as per any standard/ specification in practice in BHEL. The method of welding (arc, gas, TIG or other method) may be indicated in the detailed drawings/ schedules. BHEL Engineer will have the option of changing the method of welding as per site requirements.
- 44.2** Welding of pressure parts, equipment, piping, high tensile structural steel shall be done by certified high pressure welders who posses valid certificate of CIB of the State in which the equipment is erected as per provision of IBR. The H.P. welder who possesses necessary certificate shall ensure re-validation as per relevant provisions of IBR and keep the certificate valid till the completion of work. The services of such welders, the validity of whose certificates have expired shall not be utilized for high-pressure works.
- 44.3** All welders including tack welders, structural and high pressure welder shall be tested as per ASME section IX/ IBR and approved by BHEL/ EIL/ HMEL Engineer before they are actually engaged on work even though they may possess a valid IBR certificate. BHEL reserves the right to reject any welder if the welder's performance is not found to be satisfactory. The contractor shall maintain the records of qualification of welders. BHEL Engineer will issue all the welders qualified for the work, an identity card. The welder will keep the same with him at work place at all times. He may be stopped from work if he is not found in possession of the same.
- 44.4** Engineer may stop any welder from the work if his performance is unsatisfactory for any reason or if there is a high percentage of rejection in the joints welded by him. The welder having passed qualification tests does not absolve the contractor of contractual obligation to continuously check the welder's performance.
- 44.5** Faulty welds caused by the poor workmanship shall be cut and re-welded at the contractor's expense. The Engineer, prior to any repair being made, shall approve the procedure for the repair of defective welds. After the repair has been carried out, the compliance shall be submitted to the engineer.
- 44.6** The contractor shall carry out the root run welding of all HP/ LP piping, valves by TIG welding method only. The contractor shall have to carry out full TIG welding of butt weld joints of tubes/ pipes of lesser thickness if required. During the root runs of stainless steel joints, the contractor shall before and during welding have to purge the pipes with inert

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gas. All arrangements required for the above shall be the responsibility of the contractor at no additional cost.

- 44.7** All expenses for testing of contractor's welders including destructive and non-destructive tests conducted by BHEL/EIL at site or at laboratory shall have to be borne by the contractor only. Limited quantity of raw material required for making test pieces will be supplied by BHEL free of cost.
- 44.8** The regulators used on welding machines shall be calibrated before putting these into use for work. The Contractor at his cost shall also arrange periodic calibration for the same.
- 44.9** **Only BHEL/ CUSTOMER approved electrodes and filler wire are to be arranged and used by the contractor, within the finally quoted price. BHEL/ EIL reserve the right to test from the certified lab of approved electrode being used by the contractor. Testing charges for the same shall be borne by the contractor.** All electrodes shall be baked and dried in the electric electrode-drying oven to the required temperature for the period specified by the Engineer before these are used in erection work. All welders shall have electrodes drying portable oven at the work spot. The electrodes brought to the site will have valid manufacturing test certificate. The test certificate should have a co-relation with the lot number/ batch number given on electrode packets. No electrodes will be used in the absence of above requirement. The thermostat and thermometer of electrode drying oven will be also calibrated and test certificate from Govt. approved/ accredited test house traceable to National/ International standards will be submitted to BHEL before putting the oven in use. The contractor shall also arrange periodical calibration for the same.
- 44.10** All butt/ fillet welds shall be subject to dye penetration test as per the instructions of the engineer at no additional cost.
- 44.11** The contractor shall maintain a record in the form as prescribed by BHEL/ EIL of all operations carried out on each weld. He has to maintain a record indicating the number of welds, the names of welders who welded the same, date and time of start and completion, preheat temperature, radiographic results, rejection if any, percentage of rejection etc. and submit copies of the same to the BHEL Engineer as required. Interpretation of the BHEL Engineer regarding acceptability or other wise of the welds shall be final.
- 44.12** The contractor shall carry out the edge preparation of weld joints at site in accordance with the details acceptable to BHEL/ EIL Engineer. Wherever possible, machining or automatic flame cutting should be done. Gas cutting will be allowed only wherever edge preparation otherwise is impractical. All slag/ burrs shall be removed from the edge and all the hand cuts shall be ground smooth to the satisfaction of engineer.
- 44.13** All welds shall be painted with anticorrosive paint once radiography and stress relieving works are over. Necessary consumables and scaffolding etc including paints shall be provided by contractor at his own cost.
- 44.14** Pre-heating, radiography and other NDT tests, post heating and stress relieving after welding of tubes, pipes, including attachment welding wherever necessary, are part of erection work and shall be carried out by the contractor in accordance with the instructions of the Engineer. Contractor at his cost shall arrange all equipment and consumables essential for carrying out the above process.
- 44.15** Contractor shall arrange all necessary stress relieving equipment with automatic recording devices. The contractor arrange for labour, heating elements, thermocouples, thermo-chalks, temperature recorders, thermocouple attachment units, graphs, sheets insulating materials like asbestos cloth, ceramic beads, asbestos ropes etc. required for heat treatment/ stress relieving operations. The contractor should take a note of the following, Temperature shall be measured by thermocouple and recorded on a continuous printing type recorder. All the recorded graphs for heat treatment works shall be the property of BHEL.

All stress relieving equipment will be used after due calibration and submission of test certificate to BHEL. Periodic calibration from Govt. Approved/ accredited Test Houses

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traceable to National/ International standards will also be arranged by the contractor for such equipment at his cost.

The contractor shall obtain the signature of Engineer or his representative on the strip chart of the recorder prior to the starting of SR operations.

- 44.16** The contractor shall also be equipped for carrying out other NDT like LPI/ MPI/ Hardness test etc. as required as per welding schedules/ drawings within the finally accepted price/ rates. Ultrasonic testing, wherever required, will be arranged by BHEL. Necessary help in conducting the UT shall however be rendered by contractor.
- 44.17** The technical particulars, specification and other general details for radiography work shall be in accordance with ASME, IBR or ISO as specified by BHEL/ EIL/ HMEL.
- 44.18** Contractor for radiography work shall use iridium-192/ cobalt-60/ any other source as may be required/ specified. The geometric un-sharpness shall not exceed 1.5 mm. The contractor should take adequate safety precautions while carrying out radiography. Contractor at his cost shall arrange necessary safe guards required for radiography (including personnel from BARC).
- 44.19** Low speed high contrasts, fine grain films (D-7 or equivalent) in 10 cm width only to be used for weld joint radiography. Film density shall be between 1.5 and 2.0.
- 44.20** All radiographs shall be free from mechanical, chemical or process marks, to the extent they should not confuse the radiographic image and defect finding. Penetrameter as per ASME or ISO must be used for each exposure.
- 44.21** Lead numbers and letters are to be used (generally 6mm size) for identification of radiographs. Contract number, joint identification, source used, welder's identification and SFD are to be noted down on paper cover of radiograph.
- 44.22** Lead intensifying screens for front and back of the film should be used as per the above-referred ASME specification.
- 44.23** The joint is to be marked with permanent mark A, B, C to identify the segments. For this a low stress stamp shall be used to stamp the pipe on the down streamside of the weld.
- 44.24** For multiple exposures on pipes, an overlap of about 25-mm of film should be provided.
- 44.25** Radiography personnel with sufficient experience and certified by M/s BARC for conducting radiographic tests in accordance with safety rules laid down by Division of Radiological protection only have to be deployed. These personnel should also be registered with DRP/ BARC for film badge service.
- 44.26** All arrangements for carrying out radiography work including dark room and air conditioner and other accessories shall be provided by contractor within the space allotted for office at his cost. As an alternative the contractor may deploy an agency having all above facilities and who are duly approved/ accredited by BARC and/ or other Regulatory authorities. Detailed particulars of such agencies will be submitted and got approved by BHEL Engineer before the actual deployment of agency for radiography work.
- 44.27** The contractor shall have a dark room fully equipped with radiography equipment, film (un-exposed), chemicals and any other dark room accessories.
- 44.28** Contractor shall note that 100% radiography will be done at the initial stages on all the piping welding joints. Subsequently radiographic inspection will be done on the basis of quality of welding. However minimum percentage of joints to be radiographed shall not be less than the requirement of BHEL welding schedule/ IBR/ Customer's requirements. The percentage may be increased depending upon the quality of joints and at the discretion of BHEL/ EIL. However other NDT test as called for in the FQP including LPI, MPI and HT will have to be carried out
- 44.29** All the Radiographs shall be properly preserved and shall become the property of BHEL. They are to be reconciled with the work done, joints radiographed and submitted to BHEL/ customer.
- 44.30** Since radioisotopes are being used, all precautions and safety rules as prescribed by BHEL/ BARC/ Customer shall be strictly followed. BARC/ DRP certificate to be provided before taking up the work.

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- 44.31** Radiography of joints shall be so planned after welding that the same is done either on the same day or next day of the welding to assess the performance of HP welders. If the performance of welder is unsatisfactory, he is to be replaced immediately.
- 44.32** Wherever radiographs are not accepted, on account of bad shot, joints shall be re-radiographed and re- submitted for evaluation.
- 44.33** However, if the defect persists after first repair, further repair work followed with radiography shall be repeated till the joint is made acceptable and the penalty shots to be taken as per the requirement of BHEL/ EIL. In case the joint is not repairable, the same shall be cut, re-welded and re-radiographed at contractor's cost.
- 44.34** If the contractor does not carry out radiography work due to non-availability of source/ film/ chemical/ operator etc., BHEL will get the work done departmentally or through some other agency at the risk and cost of the contractor.
- 44.35** Heat treatment and radiography may be required to be carried out at any time (day and night) to ensure the continuity of progress. The contractor shall make all necessary arrangements including labour, supervisors/ Engineer required for the work as per directions of BHEL.
- 44.36** The contractor shall assist BHEL Engineer in preparing complete field welding schedule for all the field welding activities to be carried out in respect of piping and equipment erected by him involving high pressure welding at least 30 days prior to the scheduled start of erection work at site. The contractor shall strictly adhere to such schedules.
- 44.37** All Quality related requirement such as providing of QP, WPS, PQR etc. is to be made available before start of work as per the satisfaction of BHEL/ EIL.
- 44.38** **Check shots as per the requirement of BHEL/ EIL will be taken at your cost.**
- 45.0** **APPLICATION OF INSULATION**
- 45.1** All attachment welding, including welding of hooks/ supports as per pitch both on equipment and piping shall be done as directed by Engineer. Attachment welding shall have to be done by certified welders. If necessary, contractor may have to cut the hooks to correct length.  
Application of **anti-corrosive** paint including supply of paint on welded portions as directed by BHEL is also included in scope of work.
- 45.2** The mineral wool mattresses (bonded/ un-bonded)/ LRB mattresses are received at site in standard sizes. These are to be dressed/ cut to suit site requirements by the contractor.
- 45.3** The number of layers/ thickness of mineral wool/ LRB mattresses for auxiliaries, pipe lines, valves and other vessels shall be as per various drawings and as directed by Engineer. For applying the mineral wool mattress, the required holding materials, if necessary by fabrication of rings/ hooks shall be fixed as directed and as per drawings and spec.
- 45.4** The contractor should ensure, proper finishing of surface of the insulation, sheeting and cementing.
- 45.5** The contractor should ensure that the finished surface of the insulation works conforms to the dimensions and tolerances given in the drawings. Aesthetic finish and accuracy of work are most important.
- 45.6** It is the responsibility of the contractor to ensure that the insulation materials and sheet metal covering issued to him for application are well protected against loss or damage from weather conditions. Closed/ semi closed sheds or any other arrangements required for this will be by him at his cost. If any damage occurs to the material due to improper storage or due to any causes attributable to the contractor except for normal breakage or damages allowed in such cases, the cost of such damaged material shall be to the account of the contractor.
- 45.7** Aluminium sheet cladding will be fabricated to the sizes and shapes specified in drawings. Beading, swaging, bevelling of sheets, crowning the sheets, if necessary, will be carried out by him. Two coats of anti-corrosive black bituminous paint are to be applied on inner

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surfaces of the cladding. Bitumen sealing compound on the joints if necessary is included in the scope of this work. **Contractor may note that they will also supply anti-corrosive black bituminous paint & bituminous sealing compound required for above works at his cost.**

- 45.8** Aluminium sheet metal cladding over insulation will consists of plain/ ribbed/ corrugated sheets. The sheets will be supplied in standard sizes. Cutting them to required size, grooving, fabricating bends, boxes etc., for proper covering is contractor's responsibility. Any cutting/ bending/ welding of fabricated skin casing sheets if required will also covered within the scope of this contract.
- 45.9** A logbook shall be maintained by the contractor to obtain clearance for application of insulation. If the contractor does the work on his own accord without prior permission the area may have to be redone at his cost.
- 45.10** Contractor is liable for the exact accounting of the material issued to him and he shall make any unaccountable losses good. Wastage allowance for the material issued is as below:
- |  |    |
|--|----|
| Wool/ LRB mattresses and cladding sheets | 2% |
| Insulation bricks and mortar             | 2% |
| Castable refractory                      | 1% |
- 45.11** The entire surplus, unused materials etc., supplied by BHEL shall be returned to BHEL after the work is over. Materials like gunny bags and packing materials, empty containers may be returned at periodical intervals.
- 45.12** The contractor shall leave certain gaps and opening while doing the work as per instructions of BHEL engineer to facilitate inspection during commissioning and to fix gauges, fittings and instruments. The gaps will have to be finished as per drawings at a later date by the contractor at his cost.
- 45.13** If during erection and commissioning any of the parts are to be insulated temporarily fixed and then replaced by permanent ones at a later date or if any of the parts are to be removed for modification, rectification, adjustment and then refitted or if some parts are to be opened for inspection and checking and for measurement of metal surface temperature the same may necessitate removal and re-application of insulation and sheet metal cladding, which shall be done by the contractor and the erection rate quoted shall be inclusive of such contingencies.
- 45.14** Removable type of insulation shall be provided for valves, fittings, expansion joints etc as per the drawings or as directed by BHEL Engineer.
- 45.15** All temporary pipelines required during testing, pre-commissioning and commissioning should be insulated as directed by BHEL at no extra cost to BHEL. However required insulation material shall be issued by BHEL free of cost.
- 46.0 TESTING, PRE-COMMISSIONING, COMMISSIONING, AND POST-COMMISSIONING.**
- 46.1** The contractor shall carry out all the required tests and pre-commissioning and commissioning activities required for their successful and reliable operation. These would include trial run of all Equipments Erected, hydraulic test of condenser & Pipings, land flow test, chemical cleaning, alkali flushing, Steam Blowing, Safety valve Floating and water flushing & cardboard blasting of piping, oil flushing of oil system etc. as instructed by BHEL. Trial run of the GT/ GTG, servicing of valves and any other works incidental to commissioning.
- All the chemicals required for carrying out these activities will be supplied by BHEL free of cost.
- All required tests (Mechanical and electrical) indicated by BHEL and their clients for successful commissioning are included in the scope of these specifications. These tests/ activities may not have been listed in these specifications.
- Specialized test equipment, if any, shall be provided by BHEL/ its client free of hire charges. However contractor has to take proper care of the equipment issued to him.

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- 46.2** The contractor shall carry out the air-tightness test on assembled generator to the satisfaction of BHEL Engineer. The necessary arrangement for testing with dry-clean air shall be made by the contractor at his cost. Compressed air for testing can be taken by the contractor from the existing system
- 46.3** All the tests may have to be repeated till all the equipment satisfy the requirement/ obligation of BHEL at various stages. The contractor shall repairs all joints (shop welded or site welded) failed during testing.
- 46.4** All items/ material required for conducting hydraulic test, Detergent flushing, oil flushing, steam blowing etc., will be supplied by BHEL/ its customer.  
**While the Detergent cleaning operation including the required looping in piping, draining and disposal will be carried out by another agency, the Contractor will have to ensure the readiness and availability of CEP, associated systems and the piping which is to be cleaned. Any work required on the permanent system will have to be carried out by the Contractor.**  
**All temporary piping along with their supports for steam blowing in the systems erected by the Contractor, and the required loops for chemical cleaning of the piping erected by the contractor will have to be erected within the quoted rates. The Contractor will also be responsible for their installation wherever required. He will dismantle the total system and return the same to BHEL/ their customer store as directed. No separate payment will be released for erection & dismantling of the required equipment & piping.**
- 46.5** Thermal shocks will be required during oil flushing operations. The contractor is required to make all arrangements for the same. This would include fabrication of heating tank with nozzles and requisite piping with supports. Complete erection with pumps, tanks, electrical fittings including and other accessories is to be carried out. All material and equipment will be provided on returnable basis by BHEL.
- 46.6** The scope of pre-commissioning activities cover installation of all necessary temporary piping, supports, valves, blanking, pumps, tanks etc. and other accessories with access platforms valves, pressure gauges, electric cables, switches, cutting of some of existing valve, placing of rubber wedges in the valves etc., required for hydro test, chemical cleaning, steam blowing or for any other tests as the case may be and will carry out above activities under this scope of work as per instructions of BHEL. The scope also covers the off site disposal of effluents
- 46.7** All arrangement required for steam blowing including removal, reinstallation and welding of valves, NRV and installation of steam blowing arrangements including steam blow off piping is included in the scope of work.
- 46.8** It shall be the responsibility of the contractor to preserve the cleaned surface as per BHEL's requirement.
- 46.9** It shall be specifically noted that the employees of the contractor may have to work round the clock along with BHEL/ Customer Engineers and hence overtime payment by the contractor may be involved. The contractor's finally accepted rates/ price shall be inclusive of all these factors also.
- 46.10** It shall be the responsibility of the contractor to provide various categories of workmen in sufficient numbers along with supervisors/ Engineer with necessary consumables, T&P, IMTEs etc., along with any other assistance required during pre-commissioning, commissioning and post-commissioning of equipment and attending any problem in the equipment erected by the contractor till handing over.  
Association of BHEL's/ Client's staff during above period will not absolve contractor from above responsibilities.
- 46.11** In case, any rework is required because of contractor's faulty erection that is noticed during pre-commissioning and commissioning, the same has to be rectified by the contractor at his cost. If any equipment/ part is required to be inspected during pre-

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

- 46.12** During commissioning, opening/ closing of valves, changing of gaskets, realignment of rotating and other equipment, attending to leakage and adjustments of erected equipment may arise. This is included in the scope of work.
- 46.13** The contractor shall make all necessary arrangements including making of temporary closures on piping/ equipment for carrying out the hydro-static testing on all piping equipment covered in the specification at no additional cost.
- 46.14** The water boxes of the condenser will be tested hydraulically to 1.5 times the design pressure after its assembly at site. The arrangement of all the blanking for carrying out the hydraulic test shall be the responsibility of the contractor at no additional cost. However, only the main blanking flanges with fasteners for CW inlet and CW outlet of the condenser shall be provided by BHEL free of cost. Fabrication of blanks will be carried out by the contractor.
- 46.15** The water-fill test of the steam space shall be carried out by filling the water upto 1 Meter or as required above the top row of tubes to facilitate leak detection. Hydraulic testing shall be carried out on the condenser water boxes. Dummy plates shall be provided by BHEL.
- 46.16** The contractor shall fill the condenser upto the specified level as many times as called for by the Engineer for checking of the turbine at no additional cost
- 46.17** In case any defect is noticed during tests, trial runs and commissioning such as loose components, undue noise or vibration, strain on connected equipment etc., the contractor shall immediately attend to these defects and take necessary corrective measures. If any readjustment and realignment including repair, rectification and replacement work are necessary, the contractor shall carry out the same as per Engineer's instructions. The parts to be replaced shall be provided by BHEL.
- 46.18** During hydraulic testing of pipes, all piping having variable spring type supports shall be held securely in place by temporary means while constant spring type support hangers shall be pinned or blocked solid during the test.
- 46.19** The contractor shall carry out cleaning and servicing of valves and valve actuators prior to pre-commissioning tests and/ or trial operations of the plant. A system for recording of such servicing operations shall be developed and maintained in a manner acceptable to BHEL Engineer to ensure that no valves and valve actuators are left un-serviced.
- 46.20** Cleaning & servicing of all the filters/ strainers, toppings of oils coming in the system shall be done by the contractor till the completion of trial operation and handing over of the unit within the quoted price.
- 46.21** In case any defect is noticed during tests, trial runs and commissioning such as loose components, undue noise or vibration, strain on connected equipment etc., the contractor shall immediately attend to these defects and take necessary corrective measures. If any readjustment and realignment are necessary, the contractor within the finally agreed tonnage rate shall do the same as per Engineer's instructions including repair, rectification and replacement work. The parts to be replaced shall be provided by BHEL.

### **47.0 CONDENSER PAINTING**

- 47.1** The condenser main tube plates will be dispatched to site from the works with surface protection only on water box side. The same shall be removed adopting one of the suitable methods indicated elsewhere in this specification. The contractor shall do the surface protection of these tube plates after the completion of the tube insertion and expansion activities. The surface shall be first painted with at least two or more coats of approved quality chemical resistant epoxy zinc chromate primer after thoroughly cleaning all such parts of all dirt, rust scales greases, oils and other foreign materials by adopting suitable methods as approved by BHEL. Afterwards the above parts shall be finished with

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two or more coats of approved quality high build black coal tar coating. Before the painting is taken up, the contractor shall plug all the holes with suitable tapered plastic/ wooden plugs to avoid any damage to the tube ends. The plastic/ wooden plugs and paints required for the above operations shall have to be arranged by the contractor at his cost. The above paints are also to be applied on water chamber/ box. The thickness is to be confirmed by suitable measurement.

**47.2** The condenser steam space shall be surface protected with at least two coats of suitable steam washable paint. Before the painting is taken up, the contractor shall clean the surfaces to be coated by adopting suitable methods. The contractor at no extra cost shall procure paint for application.

### **48.0 FINISH PAINTING**

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

**48.2** **Before applying the primer paints all structure/ Pipings/ equipment/ items, shall be shot blasted as per the specification of BHEL/ EIL/ HMEL.** After completion of painting, all bright spots shall be cleaned to the satisfaction of Engineer.

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

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

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

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

**48.7** The painters have to under go test on a mock plate of size 1m\*1m and only qualified painters will be allowed to work.

**48.8** The contractor shall ensure availability of,

- Ford Cup-4 to measure consistency of paint,
- Automatic magnetic gauge to measure the dry film thickness and
- SSPC Visual standards to assess degree of cleanliness of surfaces to be painted.
- Holiday detector
- Pinhole detector
- Positector
- All equipments required for airless/conventional spray system of painting
- Digital Alchometer duly calibrated

**48.9** Bypass stack, Exhaust ducts & Safety Valves shall be painted with Heat Resistant Aluminum paint or as per specification. Inlet duct is required to be painted inside also in full length using approved quality epoxy paints.

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

**49.0 PROGRESS REPORTING**

**49.1** Contractor is required to draw mutually agreed monthly erection program in consultation with BHEL well in advance. Contractor shall ensure achievement of the program. He shall also timely arrange for additional resources considered necessary for the same at no extra cost to BHEL

**49.2** Weekly progress review meetings will be held at site during which actual progress during the week vis-à-vis scheduled program shall be discussed for actions to be taken for achieving targets. Contractor during discussions shall also present the program for subsequent week. The contractor shall constantly update/ revise his work program to meet the overall requirement. All quality problems shall also be discussed during above review meetings. Necessary preventive and corrective action shall be discussed and decided upon in such review meetings and shall be implemented by the contractor in time bound manner so as to eliminate the cause of non-conformities.

**49.3** The contractor shall submit daily, weekly and monthly progress reports, manpower reports, materials reports, consumables (gases/ electrodes) report and other reports as per performa considered necessary by the Engineer.

**49.4** The progress report shall indicate the progress achieved against planned, with reasons indicating delays, if any, and shall give the remedial actions which the contractor intends to take to make good the slippage or lost time, so that further works again proceed as per the original program and the slippage does not accumulate and affect the overall program.

**49.5** The daily manpower reports shall clearly indicate the manpower deployed, category wise specifying also the activities in which they are engaged.

**50.0 DRAWING AND DOCUMENTS**

**50.1** The detailed drawings, specifications available with BHEL engineers will form part of this tender specification. These documents will be made available to the contractor during execution of work at site. The contractor will also ensure availability of all drawings/ documents at work place.

**50.2** Necessary drawings to carry out the erection work will be furnished to the contractor by BHEL on loan, which shall be returned to BHEL Engineer at site after completion of work. Contractor shall ensure safe storage and quick retrieval of these documents.

**50.3** The contractor shall maintain a record of all drawings and documents available with him in a register as per format given by BHEL Engineer. Contractor shall ensure use of pertinent drawings/ data/ documents and removal of obsolete ones from work place and returning to BHEL.

**50.4** The data furnished in various annexure enclosed with this tender specification are only approximate and for guidance. However, the change in the design and in the quantity may occur as is usual in any such large scale of work.

**50.5** Should any error or ambiguity be discovered in the specification or information, the contractor shall forthwith bring the same to the notice of BHEL before commencement of work. BHEL's interpretation in such cases shall be final and binding on the contractor.

**50.6** Deviation from design dimensions should not exceed permissible limit. The contractor shall not correct or alter any dimension/ details, without specific approval of BHEL.

**50.7** Any ambiguity found in the drawings should be brought to the notice of engineer prior to start of work.

**50.8** Certain revisions of drawings are received during the course of execution, if the same have been received prior to start of particular (specific) job then no claim will be admissible on this account.

**51.0 INCOME TAX, SERVICE TAX AND SALES TAX ETC.**

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**51.1** **Income tax** & surcharge, if any at prevailing rates shall be deducted on gross invoice value from the running bills unless Exemption Certificate from appropriate Income Tax Authority is furnished.

**51.2** **Price quoted shall be inclusive of all taxes/ duties except for service tax.** The service tax, as legally leviable & payable by the contractor under the provisions of applicable law/ act, shall be paid by BHEL as per contractor's bill. However, contractor shall have to submit proof of service tax deposited by them immediately after the deposit but not later than the next bill submitted after the due date of deposit. The contractor shall furnish proof of Service Tax registration with Central Excise Division covering the services covered under this contract. Registration should also bear endorsement for the premises from where the billing shall be done by contractor on BHEL for this project. The contractor shall obtain prior approval of BHEL before billing the service tax amount

With introduction of Cenvat credit rules 2004 which came into force w.e.f. 10.09.2004, excise duty paid on input goods including capital goods used for providing the output service and service tax paid on input service can be taken credit of against the service tax payable on output service. **As such, while offering the rates, the contractors may take into account the benefit of above provisions as the cost of input to contractors will be the cost net of excise duty and service tax and adjust their offer price accordingly to make it more competitive.** In respect of Construction Services, the contractor should avail abatement of 67% as per notification no. 15/ 2004-ST dated 10.09.2004 as & if applicable.

**51.3** 'TDS' for sales tax on Works contract at prevailing rates shall be deducted from the running bills as applicable unless Exemption Certificate from appropriate Authority is furnished. Reimbursement, if any, on account of Sales Tax on Works Contract as legally leviable and payable by the contractor shall be made on the production of requisite documents i.e. assessment order etc. of the 'Appropriate Authorities' by the contractors provided contractor has not opted for lump sum/composition scheme.

In VAT applicable States, "Tax Invoice" as required under the relevant State VAT law shall be submitted along with other compliances as per concerned VAT Act. In case of non civil contracts, reimbursement, if any, on account of VAT on Works contract as legally leviable and payable by the contractor shall be made on the production of requisite documents i.e. assessment order etc. of the 'Appropriate Authorities' by the contractors provided contractor has not opted for lump sum/ composition scheme. In case of civil contracts the rate quoted should be inclusive of VAT. However "Tax Invoice" as required under the relevant State VAT law shall be submitted along with other compliances as per concerned VAT Act. However, 'TDS' for VAT on works contract will be applicable as per applicable law.

**51.4** Contractor shall get his organization registered with concerned Sales Tax/ VAT authorities within 15 days of award of this contract. The delay on this account and delay in bringing the material shall be to contractor's account and no extension of time shall be allowed on this account. The Sales Tax/ VAT registration for this contractor shall be forwarded to BHEL within 30 days from the date of LOI. In case the contractor is already registered for Sales Tax/ VAT with Govt. Authorities he must quote his registration no, while submitting their tender.

**51.5** Contractor has to make his own arrangement at his cost for completing the formalities, if required, with Sales Tax Authorities, for bringing his materials, tools & plants, equipment at site for the execution of the work under this contract.

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### 52.0 EXTRA WORK

52.1 BHEL may consider for payment of extra works on man hour basis @ Rs. 30/- (Rupees thirty only) per man hour only for such of those works which:

- a Require major revamping or rework and which are totally unusual to normal erection work.
- b Require rectification/ modification for improvement in the design during commissioning,
- c Requiring fresh fabrication of components in place of rejected/ replaced components

52.2 The rates indicated as above, shall include over time, if any, consumables, supervision, use of tools and tackles and other site expenses and incidentals.

52.3 The extra works, if any, shall be carried out by a separate gang, which will be identified for certification of man-hours. This gang will not be utilized for any other work during the period that they are engaged in the extra-work. Logbook should be maintained and should be signed jointly by the contractor's representative and BHEL Engineer on day-to-day basis. However, signing of the logbook does not necessarily mean acceptance of the extra works, which would be identified by Engineer, whether work is covered in one of the above categories. Only those works and man-hours that are certified by the BHEL Engineer-in-charge will be considered for payment. The decision of BHEL in this regard shall be final and binding on the contractor.

### 53.0 PRICE VARIATION

53.1 The finally accepted rates for scope of work as defined in this tender are subjected to price variation provisions as per following formula:

$$P_1 = \frac{0.75 \times P_0 (F_1 - F_0)}{F_0}$$

$P_1$  = Increase/ Decrease in billing amount (variation) for the particular month of billing.

$P_0$  = Billing amount calculated as per contract provisions.

$F_1$  = All India CPI published by Labour bureau, Simla, Govt. of India, for Industrial workers (Base 2001 =100) applicable for the month under consideration i.e. for which bill has been raised.

$F_0$  = All India CPI published by Labour bureau, Simla, Govt. of India, for Industrial workers (Base 2001 =100) applicable for the month of opening of technical bid.

53.2 The contractor will be required to raise the bills for price variation payments on a monthly basis irrespective of the facts whether any increase or decrease in CPI. Price variation as per above formula will be calculated and paid/ deducted on the total contract value (excluding payments towards extra works and over run, if any) on month-to-month basis. BHEL however reserves the right to freeze variation for that much of duration of delays, from time to time, which are entirely attributable to the contractor. **Average of applicable price indexes paid shall be taken as index for PVC for final 5% amount.**

53.3 With the provision of price variation as above NO CLAIM/ COMPENSATION on account of any increase whatsoever, (irrespective of whether variation are steep/ unanticipated or not compensated by the above escalation provisions in full towards minimum wages, consumables, electrodes, gases or any other item/ reason) will be payable during the entire period of execution including extended period, if any unless provided for elsewhere in the contract.

### 54.0 RATE SCHEDULE

54.1 Contractor shall fully understand equipment description and scope of work before quoting. The scope of work and responsibility of the contractor as mentioned under these specifications shall be covered within the quoted rates.

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**54.2** The tenderer shall quote the rates as per the rate schedule only, in part II price bid (Original). Conditional price bids or price bids with any deviation/ clarification etc. are liable to be rejected. No cutting/ erasing/ over writing shall be done.

**55.0 INSTRUCTIONS TO TENDERER**

**55.1** Offers received without data/ information required to be submitted under tender clauses- 11.1 to 11.11 are liable to be rejected. All these data/ information should be duly supported by documentary evidences (Refer note below clause-11)

**55.2** No deviations to the tender conditions will normally be accepted.

**55.3** The tenderer is advised to actually visit the site and fully acquaint themselves with site conditions, **safety norms being followed/ to be followed during working inside refinery (Tenderer must submit a report, along with the technical bid, indicating their observations on safety aspects being followed at Refinery & their action plan for compliance of these safety norms)**, location of stores, transportation routes, quantum of work etc. before quoting their rates for this work. BHEL shall not be responsible in any way for non-familiarization of site conditions. Once the tenderer has quoted for the work, it is implied that he has ascertained various site condition and NO CLAIM whatsoever will be entertained by BHEL on any such account.

**55.4** The contractor in the event of this work awarded to him, shall establish a site office at site and keep posted an authorized responsible officer who should hold a valid power of attorney for the purpose of the contract. Any order or instruction of the Engineer or his duly authorized representative shall be communicated to the contractor's representative at site office and the same will be deemed to have been communicated to the contractor at his legal address.

**55.5 LIQUIDATED DAMAGES (LD)**

For delay in completion of work attributable to the contractor, the LD shall be applicable at the rate of ½% of the contract value per week of delay or part thereof limited to a ceiling of 10% of the contract value as mentioned under clause no.25.5 of the GCC of the tender.

**55.6 SECURITY DEPOSIT**

The contractor shall submit Security Deposit within 15 days from the date of issue of LOI as per clause no. 16.2 of the General Conditions of Contract (GCC). In case the contractor opts to furnish Bank Guarantee as a part of Security Deposit, the BG shall be issued as per the Performa enclosed as per Annexure-H of the GCC and also that the BG should be issued preferably through any of the Member Banks listed in GCC;

For BG through any other Nationalized Bank (Not covered in the list of Member Banks of GCC), the discretion of its acceptance shall lie solely with BHEL.

Refund of Security Deposit shall be in line with Clause no. 16.10 of GCC.

**55.7 INSURANCE**

**55.7.1** Besides provisions under clause no. 29.0 of GCC regarding insurance, the following shall also be applicable. The contractor shall also take care of the same while submitting their offer.

**55.7.2** Insurance for all materials pertaining to the Contractor (T&Ps, Construction Materials etc.) during transit, storage and during construction shall be in his (Contractor's) scope.

**55.7.3** The Contractor shall provide insurance cover to all persons employed/ engaged by him throughout the period of Contract, including the extended period, if any.

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**55.7.4** In addition to insurance as per Workman Compensation act. Employer's liability and also Group Personal Insurance for employees are also to be taken by contractor.

**55.8 OTHERS**

**55.8.1** In case of any contradiction between General Conditions of Contract (GCC) and Special Conditions of Contract (SCC), the latter shall prevail.

**55.8.2** For reverse auction/ for Price Bid opening, only those bidders will be considered who will be qualified for the subject job on the basis of pre-qualification evaluation/ Techno-commercial bids. BHEL reserves the right to reject the bidders with unsatisfactory past performance in the execution of a contract. BHEL's decision in this regard shall be final & binding.

**SECTION - III B  
SPECIAL CONDITIONS OF CONTRACT**

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**SECTION - III B**

**SPECIAL CONDITIONS OF CONTRACT**

**56.0 SCOPE OF WORK**

**1.0** Scope of these specifications include but not limited to following:

BHEL has been awarded the work of setting up a CPP to meet the Steam & Power requirement for the GGSRP, Bathinda Refinery project of 153 MW - CPP Comprising of 4X240 TPH UTILITY BOILERS, 2X110 TPH HRSG WITH SF, 2X36 MW STG (Db Ext), 1X32 MW STG (Bk Pr), 2XFR-6 GTG, Transformers & BOP's. The plant is to be Engineered, Supplied, Erected and Commissioned on EPC basis by BHEL.

The details of major equipments to be erected, tested & commissioned under these specifications are as per Annexure-1.

The scope of work under this tender for 2X36 MW STG (Db Ext), 1X32 MW STG (Bk Pr), 2XFR-6 GTG sets along with related auxiliaries, Piping, Deaerator, BFPs & other miscellaneous equipment related to this package broadly consists of:

- 1.1 Receipt of Materials from BHEL Store/ yards/ other designated places (approximately 2 Km) and transportation to erection site/ TG/ GT Floor, their preservation, safe keeping, watch and ward.
- 1.2 Checking, dressing, chipping and leveling of foundations, pre-assembly, erection, alignment of various equipment, machining and grouting.
- 1.3 Welding, heat treatment, radiography (including supply of radioactive sources) and other non-destructive tests wherever required
- 1.4. Erection and commissioning of GT & GTG with all auxiliaries.
- 1.5. Erection and Commissioning of STG (Db Ext) & STG (Bk Pr) with all Auxiliaries.
- 1.6. Erection and Commissioning of all BFPs (Turbo-driven + Motor Driven)
- 1.7. CW Piping from inlet & outlet of Condenser up to Terminal Point (i.e. 'A' row of STG Building) including RE Joints, BF Valves.
- 1.8. Erection and commissioning Gland Steam Condenser, Drain Cooler, LP Heaters, HP Heaters
- 1.9. Erection and Commissioning of Condenser with extraction steam piping and air extraction piping inside condenser steam space upto condenser walls, erection of CW piping from APCPL battery limit to condenser water boxes including Erection, Commissioning, load testing of Condenser water box handling arrangement.
- 1.10. Erection, Commissioning of Condenser on load tube cleaning systems, plate heat exchangers and self cleaning strainers.

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- 1.11. Erection and Commissioning of Deaerator and Feed Storage Tank with platform and accessories.
- 1.12. Erection and Commissioning of Misc. Pumps (ACW, ECW, Lube Oil Transfer, submersible pumps, DM injection & circulation pumps, HSD & LCO forwarding pump, condensate ext. pump, condensate water pump, jockey pumps, chilled water pumps, absorbent & sump pumps, condensate transfer pump), Misc Tanks, Piping and other BOP packages with their accessories.
- 1.13. Grouting, painting, insulation of all equipments as per requirement along with supply of required materials, machineries and other resources as required carrying out the job.
- 1.14. Arranging statutory co-ordination for IBR related activities.
- 1.15. Erection, Commissioning of Misc. skids (gas conditioning skids, centrifuge skids, HSD forwarding skid, filter skids, HP dosing skids, LP dosing skids, CW dosing skids) through accredited agency.
- 1.16. Erection, Commissioning & Operation of gas booster compressors (02 nos.)
- 1.17. Erection and Commissioning of Auxiliaries of Turbine, Generator, BFPs and other systems.
- 1.18. Erection and Commissioning of blow down tanks for utility boilers.
- 1.19. Erection, Commissioning of Turbine lub oil, governing oil, Generator seal oil system, gas system, Jacking oil system, control fluid system, Primary Water system, dirty/ waste fluid system, Gland steam system - for main turbine and drive turbines of BFPs, Water drainage system, Turbine Governing System with Valves and their servomotors, LP Bypass System with Valves, servomotors and other systems tanks and equipments as per scope.
- 1.20. Vacuum pumps with connected piping and other integral piping.
- 1.21. Erection and Commissioning of Piping and valves covering HP steam, MP steam ,LP steam, Boiler Feed, Condensate System to make system complete and with associated pipelines etc. within the terminal points.
- 1.22. Preservation of TG & Aux. Components after receipt from BHEL Store.
- 1.23. Chemical cleaning (assistance) and associated testing plus related activities of different system and normalization
- 1.24. Arrangement of fixing of steam blowing and hydro-test blanks and restoration.
- 1.25. Arrangement for hydro-test/ steam blowing in strainers including removal/restoration in MS & HRH lines etc.
- 1.26. Flushing, steam blowing, related testing, pre-commissioning, commissioning activities of lub oil system, governing oil, gas systems, water lines and other systems of Turbine, Generator, Condenser, BFP and other auxiliaries. This includes preparation for flushing, hydro-test, chemical cleaning, steam blowing, other cleaning activities, actual execution of the activities, normalization etc.

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- 1.27. Setting and commissioning of governing system.
- 1.28. Preparation of MIRs, following of safety and quality norms and documentation, preparation of material status and up-gradation of activities, networks at regular intervals.
- 1.29. Trial run of motor, equipments, systems as a whole.
- 1.30. Assistance during PG Testing of main equipment along with all auxiliaries. Completion of punch points and assistance for handing over of unit (s) to customer.

**Major equipment to be installed, tested and commissioned under this specification is (Details given in Annexure I) given below.** However, changes in design may occur as is usual in any such large scale work for which no compensation will be payable and contractor shall complete the entire work as detailed in tender specifications within finally accepted rates/ prices.

### **2.0 32 MW Steam Turbine (Back Pressure)-01 no.**

- 2.1 Steam Turbine including Emergency Trip Cum Stop Valve, Blanket plate for steam blowing, Turbine Steam Governing Valves, Steam Strainer Built into Stop Valve, Solenoid Valve for Remote Tripping, Turbine Sole Plates Foundation bolts, shaft grounding device, Mating Flanges for Turbine Inlet and Exhaust Flanges
- 2.2 Reduction Gearbox between Turbine & Generator including Coupling and Coupling Guard between Turbine & Gearbox; and Coupling and Coupling Guard between Gearbox & Generator, sole plates for gear box
- 2.3 Manual Barring Device and Turning Device -Electric
- 2.4 Turbine Integral Piping including Gland Steam Leak-off Piping, Turbine Drain Water Piping within TG Block; Complete Lube Oil Piping (Stainless Steel Material after filter outlet); Complete Control Oil Piping (Stainless Steel Material); Overhead Lube Oil Complete Piping (Stainless Steel), Turbine Insulation (Mineral Wool Mattresses) and Insulation of Integral Piping, Thermo-elements for bearings, SCNRV in exhaust lines.
- 2.5 Turbine Enclosure (To meet noise level requirements)

### **3.0 Steam Turbine Auxiliaries (For 32 MW STG)**

- 3.1 Main Oil Tank (Carbon Steel)
- 3.2 Main Oil Pump with AC Motor (centrifugal)
- 3.3 Auxiliary Oil Pump with AC Motor (centrifugal)
- 3.4 Emergency Oil Pump with DC Motor (centrifugal)
- 3.5 Duplex Filter for Lube Oil including Trans-flow Valves
- 3.6 Oil Mist Fan with AC Motor (2x100%)
- 3.7 Overhead Lube Oil Tank
- 3.8 Oil Accumulators
- 3.9 Oil Purification Unit (1,000 LPH)
- 3.10 Governing Console
- 3.11 GLAND STEAM CONDENSER. Consisting of Steam jet air ejectors - 2x100%

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3.12 LUBE OIL COOLERS - 2X100%.

**4.0 32 MW GENERATOR AND AUXILIARIES.**

4.1 Generator with Stator, Rotor, built-in RTDs with leads brought out to a terminal board, bearings, base frame, side terminals and with bottom mounted air to water heat exchangers and Line side and neutral side terminal boxes to accommodate CTs, PTs, LA& SP equipment. Line side terminal box will have cable termination facility.

4.2 Brush-less exciter with PMG.

4.3 GENERATOR AIR COOLERS.

**5.0 36 MW Steam Turbine (Db. EXT)-02 nos.**

5.1 Steam Turbine including Emergency Trip Cum Stop Valve ,Turbine Steam Governing Valves(HP,IP,LP),Steam Strainer Built into Stop Valve, Blanket plate for steam blowing, Reduction Gearbox between Turbine & Generator including Coupling and Coupling Guard between Turbine & Gearbox; and Coupling and Coupling Guard between Gearbox & Generator, Solenoid Valve for Remote Tripping, Turbine Sole Plates/ Foundation Bolts; Shaft Grounding Device; Mating Flanges for Turbine Inlet and both Extraction Flanges, Gland Sealing System (Automatic), Exhaust-hood spray system (automatic), QCNRV's in both extraction lines(loose supply)

5.2 Manual Barring Device and Turning Device -Electric

5.3 Integral Piping Including Gland Steam Leak-off Piping, Gland

5.4 Steam Piping for STG integral portion, Turbine Drain Water Piping within TG Block; Complete Lube Oil Piping (Stainless Steel Material after filter outlet); Complete Jacking Oil Piping including Throttle Valves, Relief Valves ; Complete Control Oil Piping (Stainless Steel Material); Overhead Lube Oil Tank Piping (Stainless Steel), condensate piping

5.5 Turbine Enclosure (To meet noise level requirements)

5.6 Turbine Insulation (mineral Wool Mattresses) and Insulation of Integral Piping

**6.0 36 MW Turbine auxiliaries**

6.1 Main Oil Tank (Carbon Steel) Including

6.2 Overhead Lube Oil Tank

6.3 Main Oil Pump with AC Motor

6.4 Auxiliary Oil Pump with AC Motor

6.5 Emergency Oil Pump with DC Motor

6.6 Jacking Oil Pump with AC Motor

6.7 Duplex Filter for Lube Oil

6.8 Oil Mist Fan with AC Motor (2x100%)

6.9 Oil Accumulators

6.10 Oil centrifuge (2400 LPH)

6.11 Governing Console

6.12 SURFACE CONDENSER consisting of appx. 6,500 Tubes (35 MT) of size dia. 19.05 x 16BWG x 4500 mm

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- 6.13 STEAM JET AIR EJECTOR consisting of Running ejectors 2 X 1 00%; Starting ejector 1 X 100% ; nter /after condensers 2 X 100%
- 6.14 GLAND STEAM CONDENSER.
- 6.15 DEAERATOR
- 6.16 HP HEATER
- 6.17 LUBE OIL COOLERS - 2X100%.
- 6.18 Condensate Extraction Pumps 2 x 100% (Vertical) along with drive motors and accessories.
- 6.19 Boiler Feed Pumps 2 x 100% along with drive motors and accessories.
- 6.20 DM Water Pumps 2 x 100% along with drive motors and accessories.
- 6.21 Boiler Fill Pump 1 x 100% along with drive motor and accessories.
- 6.22 H P Heaters
- 6.23 Flash tanks for HP Heaters
- 6.24 Monorail along with chain pulley block for BFP maintenance.
- 6.25 Handling facilities for bigger size valves and PRDS stations as required.
- 7.0 36 MW GENERATOR AND AUXILIARIES**
- 7.1 CLOSED circuit air cooled Generator (VPI)
- 7.2 Brush-less exciter and PMG
- 7.3 CO2 fire extinguisher equipment for generator.
- 7.4 GENERATOR AIR COOLERS.
- 8.0 GT & AUXILIARIES (02 NOS.)
- 8.1 Gas Turbine Skids
- 8.2 Gas Turbine Generators skids
- 8.3 Accessory system skid
- 8.4 Load couplings
- 8.5 GT walkways
- 8.6 Main Filter House
- 8.7 GT vent ducting
- 8.8 Air Processing skid
- 8.9 Compressor water wash skid
- 8.10 lube oil centrifuge
- 8.11 GT batteries with Charger
- 8.12 Field interconnecting piping
- 8.13 Inlet Ducting consisting of Silencers
- 8.14 Expansion Joints & Support Structures
- 8.15 Exhaust System consisting of Ducts

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- 8.16 Expansion Joints
- 8.17 Diverter Damper
- 8.18 Guillotine Damper
- 8.19 Stack Transit Pieces
- 8.20 Silencer in Stack
- 8.21 Cylinder Stack (4 no)
- 8.22 Stack support Structures
- 8.23 Diverter & Guillotine Panels
- 8.24 Seal Air Fans
- 8.25 Water injection Skids
- 8.26 GT & Off Base Enclosures
- 8.27 Gas Booster Pumps

### **9.0 SYSTEM PIPING**

#### **9.1 Gas fuel system**

Piping from B/L to gas conditioning skid area to GBC hall, Piping from GBC hall to GTGs, Piping from header to GTGs, Piping from B/L to Ubs, Piping from Header to UB - branch lines, Piping from B/L to HRSGs, Piping from Header to HRSG, Flare piping, Valves and fittings

#### **9.2 Fuel Oil Piping**

##### **9.21 LCO piping**

Battery limit to inlet of tank, Piping from tank outlet to Skid to GTGs, Piping from tank outlet to skid to Ubs, Branch ppg to Ubs, Piping from tank outlet to skid to HRSGs, Branch ppg to HRSGs, LCO tank piping, Suction piping for pump skids, Recirculation piping, Valves and fittings

##### **9.22 HSD piping**

Battery limit to inlet of tank ,Piping from tank outlet to Skid to GTGs, Piping from tank outlet to skid to Ubs, Branch ppg to Ubs, Piping from tank outlet to skid to HRSGs, Branch ppg to HRSGs, LCO tank piping, Suction piping for pump skids, Recirculation piping, Valves and fittings

#### **9.3 Feed water system**

Battery limit to inlet of tank, Main header for Ubs, DM tank to MUH and to deaerator, Branch BFW ppg for Ubs, Main header for HRSGs, Branch ppg for HRSGs, Export ppg, BFP recirculation ppg to deaerator (4 nos.) – UB, BFP recirculation ppg to deaerator (3 nos.) – HSRG, BFP recirculation piping up to deaerator (2 nos.) – Export, Suction ppg for UBs, Suction ppg for HRSGs, Suction ppg for Export BFPs, Spray water lines from BFP headers

#### **9.4 Condensate system**

Condensate line from STGs to CST, MUW ppg from CST to D/A, MUW ppg from B/s to CST, Condensate line from B/L to CST, Valves and fittings

**9.5 Steam system**

**9.51 VHP STEAM PIPING**

VHP Main header, UB-Branch lines – VHP, HRSG-Branch lines – VHP, HRSG-Branch lines - sub header – VHP, VHP steam line to BPTG, VHP steam line to STGs, VHP steam line to PRDS- VHP TO HP, VHP steam line to PRDS - VHP TO MP, VHP steam line to PRDS - VHP TO LP, Valves and fittings

**9.52 HP steam piping**

HP Main header, HP extraction lines from STGs, HP steam line to FD fans drive, HP steam drive to BFPs & LCO pump drive, ejectors, PRDS, Valves and fittings

**9.53 MP steam piping**

MP Main header, MP line for atomizing steam for HRSG's, UB's, PRDS etc. MP steam extraction line from STGs, MP steam line from LCO pump drives, Valves and fittings

**9.54 LP steam piping**

LP Main header, LP line from BPTG,LP line from PRDS,LP line from FD fan drives, LP line to MISC consumers, piping to deaerator, SCAPH of UB, soot blowers of UB's & HRSGs, VAR system of control room, Steam line to heaters, Condensate lines, Valves and fittings

**9.55 Cooling water system**

Battery limit to cooling tower basin, CW supply and return for condensers, Side stream filter piping, ACW supply and return headers, ACW supply and return – GTGs, ACW supply and return – STGs, ACW supply and return – GBCs ,Misc ppg for Ubs, Misc ppg for HRSGs, Misc ppg for BFPs, Misc ppg, Valves and fittings, Butterfly valves

**9.56 Instrument air system**

Instrument air supply header, Service air supply header, Instrument air distribution piping, Service air dist piping, air dist. Piping, Nitrogen piping, Nitrogen distribution piping, Valves and fittings

**9.57 Miscellaneous piping**

Potable water and service water piping, Potable water and service water piping, Drain and vent piping, Effluent collection and disposal piping, Valves and fittings, Insulation material for piping, Pipe supports, HP/ LP dosing skid piping including dressing drains to neutralizing pit, Impulse piping up to and including first battery of root valves, Miscellaneous/ BOIs of supplied by BHEL MUs/ PED/ vendors.

**NOTES:-**

- a) All the above systems of piping include the erection of pipes, bends, elbows, valves, fittings, impulse piping up to and including first root valve(s), sampling lines, drains, hangers and supports and other accessories so as to make the system complete in all respects.

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- b) Above systems of piping can be regrouped/ renamed or any addition or deletion in the system can be made in order to make system complete as per requirement. No extra claim shall be entertained on this account.
- c) The equipment and piping systems indicated above are only major items and does not cover all the equipment/ piping system to be erected/ commissioned. Contractors are however, required to erect/ commission within the price quoted by them, all connected equipment/ system shown in manufacturer's drawings/ other documents which may be necessary for erection completion and overall commissioning of TG set under scope of this tender.

**10.0 ADDITIONAL PLATFORM/ STRUCTURES**

Additional platforms and approaches wherever required by the engineer to facilitate operation are to be fabricated and installed. These are covered under the erection of static auxiliaries.

**11.0 INSULATION**

All piping and equipment, as per requirement/ drawings are to be thermally insulated with bonded/ unbounded mineral wool/ LRB mineral wool and to be covered with aluminum cladding. Bidders are required to quote rate in Rs per MT against ITEM NO.-4 of RATE SCHEDULE for entire insulation work. Only spray insulation wherever applicable is not covered in this scope of work.

**56.2 The contractor has to provide the following services exclusively for BHEL within the quoted price:**

**Skilled computer operator – 24 man months**

**Skilled worker - 36 man months**

**Unskilled worker - 72 man months**

Persons so deployed shall have to work in extended hours whenever required. Workmen provided as per the above provisions shall be fully trained and experienced in the nature of work for which they are deployed.

**In case contractor fails to provide above-mentioned manpower as desired by BHEL, the latter shall have the right to hire such services from other agencies at the risk and cost of the contractor. However, if BHEL does not utilize the man months as per above provision, fully or partly; recovery at the rate of the prevailing minimum wages at BATHINDA,REFINERY for the categories given plus 10% will be made from the final bill of the contractor.**

The scope of work will also include providing qualified & experienced Supervisors for direct supervision of various works other than the scope covered under this tender. These qualified & experienced Supervisors shall be provided for 36 (thirty six) man-months as per site conditions. The supervisors shall possess a minimum qualification of a mechanical/ electrical engineering diploma. They shall be deployed in all areas covered under various specifications as well as other related areas as may be deemed essential based upon work requirements, though not specified. They shall be guided by BHEL Engineers to ensure smooth work progress as and when/ where required/ deployed. No separate payment shall be paid for providing the services as per this clause. The contractor shall provide these free of cost services within the quoted rates as per Rate Schedule.

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In case contractor fails to provide above-mentioned engineers as desired by BHEL, the latter shall have the right to hire such services from other agencies at the risk and cost of the contractor. In case BHEL is not able to utilize the man months as per provision, a lump sum of **Rs.10,000/-** (Rupees Ten Thousand Only) per man month for the un-utilized man months will be recovered from the bills of the contractor.

- 56.3 The customer M/s HMEL and/ or their consultant (M/s EIL) may depute their representative for checking and supervision of important stages of work. The contractor shall be required to provide QP, WPS, PQR etc as per the format, all facilities for inspection of works, without any cost implications to the BHEL. Any defect in quality of work or deviation from drawings/ specifications pointed out during such inspection shall be made good by the contractor in the same way as if pointed out by the BHEL engineer, without any cost implication to BHEL.

**Approx. weight of major components has been indicated in Annexure I**

The contractor is required to erect actual tonnage (irrespective of any variation plus or minus) which may be necessary to complete their work and commission above systems and complete the work in all respects as detailed in tender specifications, for which payments shall be released on finally accepted rates. The contractor undertakes to erect/ commission actual quantities as per advice of BHEL Engineer and accordingly the final contract price shall be worked out on the basis of quantities actually erected at site and payments will also be regulated for the same. **However, in case of overall reduction in contract value beyond 30%, the contractor will be eligible for compensation as per the following provision:**

**“The actual executed value shall be raised by 10% subject to the condition that the total value of work executed plus increase as above shall be limited to 70% of the awarded contract value”**

Contractors shall take above into account while quoting the unit rates quoted as per Rate Schedule so as to take care of such variation during execution stage.

**57.0 FACILITIES TO BE PROVIDED BY BHEL/ CONTRACTOR**

- 57.1 BHEL shall provide limited open space for office and store/ workshop at site free of rental charge as and where made available by M/s HMEL within the plant premises. It is the responsibility of the contractor to develop the space for construction of office sheds, to provide all utilities like electricity, drinking water etc., as a part of his scope of work within the accepted rates. Contractor shall make water arrangement from the water pipe line of local network area.
- 57.2 The Contractor shall be responsible for providing all necessary facilities like residential accommodation, transport, electricity, water, medical facilities etc. at his own cost as required under various labour laws and statutory rules and regulations framed there under to the personnel employed by him.
- 57.3 Construction power (440 V, 3 phase) for construction purposes will be provided, if available on Chargeable basis, at one point @ Rs. 7.96 per KWHr. All the work related to laying of cable, distribution board etc. for construction power which shall be arranged by CONTRACTOR at his own cost. The cost of power supply shall be recovered every month at the prevailing rates against the power consumption. The energy meter to be installed by the contractor & shall be tested and certified by State Electricity Board or any other agency approved by the EIL/ HMEL at his cost. The construction power shall be made available to the contractor subject to grid disturbance, and no extension of time or

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compensation shall be payable on this account. Therefore, the contractor shall make alternate arrangement to cop up with such eventuality within the contract price. The contractor must have to deploy DG set of required capacity with fuel, operation and maintenance to meet the electricity requirements for entire period of execution of construction work, if not provided by BHEL/ HMEL. No construction Power shall be provided for work outside the battery limit of the Plant. The Contractor shall not effect any change in the temporary installation unless permission is obtained from BHEL/ EIL/ HMEL/ state electricity authorities approved the installation or their authorized representatives. Contractors are requested to take above into account while quoting. The Contractor confirms that unit rates quoted above take care of such variation during execution stage

- 57.4 Construction water and drinking water shall be supplied free of cost at plant premises by the HMEL at a single point near the battery limit. The construction water shall be ground water. The Contractor shall make his own arrangements to lay and maintain necessary distribution lines at his own cost.
- 57.5 Adequate lighting facilities such as flood lamps, hand lamps and area lighting shall be arranged by the contractor at the construction site, contractor's office and material storage area etc. within finally accepted rates.
- 57.6 BHEL /EIL/ HMEL will not be responsible for any loss or damage to the contractor's equipment as a result of variation in voltage or frequency or interruptions in power supply, if provided by BHEL/ HMEL.
- 57.7 Provision of distribution lines of both electrical power and water from the central points to the required place with proper distribution boards observing the safety rules laid down by the electrical authorities of the state shall be done by the contractor, supplying all the materials like cables, distribution board, switch boards, TPN, CBS, ELCBS/ MCCBS/ Copper/ Brass clamps, copper conductor, change over switches pipes etc. If any failure is caused in supply of the power and water, it is the responsibility of the contractor to make alternate arrangements at his own cost. The contractor shall adjust his working shifts/ hours accordingly and deploy additional manpower, if necessary, so as to achieve the targets.
- 57.8 The contractor while drawing construction power (if available) supply from Distribution Board should strictly adhere to following points:

All electrical installations should be as per Indian Electricity rules.

All distribution Boards installed by the contractor should be constructed with fireproof materials viz. Steel frames, Bakelite sheets etc.

Connection for single phase should be taken from phase and neutral. Nowhere the connection should be taken with earth as neutral.

Contractors have to make their own arrangement for their equipment/ DB earthing

All electrical connections should be made through connectors, nuts and bolts, switches, plug and sockets. Loose connections or hooking up of wires shall not be permitted.

All electrical equipment/ tools and plants should be properly earthed. DBs are to be earthed diagonally opposite at two points.

Contractor should use "MCCB" and "ELCB" either on incoming or outgoing connections to the DBs.

Contractor should ensure that all the CBs/ TPNs/ Fuses/ MCCB/ ELCB cables etc. should be of adequate rating/ capacity.

For permission of supply connections contractor has to submit a test report of their installations with a single line diagram of connected/ proposed loads.

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

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- 57.10 In case of power cuts / load shedding no compensation for idle labour or extension of time for completion of work will be given to contractor.
- 57.11 Unloading/ Verification operation work can be carried out through out the day and night however adequate lighting facilities such as floodlights, hand lamps and area lighting shall be arranged by the contractor at the site of contractor's material storage area, as well in labour colony.
- 57.12 On completion of work or as and when required by BHEL, all the temporary buildings, structures, pipe lines, cables etc shall be dismantled and leveled and debris shall be removed, as per instructions of BHEL, by the contractor at his cost. In the event of his failure to do so, the Engineer will get it done and expenses incurred shall be recovered from the contractor along with prevailing overheads. The decision of BHEL Engineer in this regard shall be final.
- 57.13 **No land will be provided for labour colony. The contractor has to construct the labour colony as per Annexure-XIII (Sketch). They have to establish, operate and maintain the same as per the sketch.**
- 57.14 BHEL shall provide required chemicals for the purpose of chemical cleaning/ Alkali flushing of piping.
- 57.15 Compressor required capacity for construction purposes shall be arranged by Contractor.
- 57.16 NA
- 57.17 **Contractor should install a PC ALONG WITH MODEM to connect with our server (LAN) AT SITE.**

**58.0 TIME SCHEDULE**

- 58.1 The contractor is required to commence the work within 15 days from the date of issue of LOI unless BHEL decides to fix any other later date. However, the actual date of start of work, to fix up the zero date of the contract, will be certified by BHEL Engineer after adequate mobilization of manpower and T&Ps by the contractor.
- 58.2 Entire work as detailed in the tender specifications shall be completed within **10 months** from the Zero date as per programme/ milestones indicated by BHEL Engineer. Contractor has to mobilise adequate resources to meet BHEL commitments to the customer as indicated from time to time.
- 58.3 The various milestones to be achieved in **Unit – 1(STG-BACK PR.)-32MW** under this tender is as under:

<b>MILE STONES</b>	<b>MONTH</b>
STG Erection Start	ZERO
TG Box Up	FOUR
Oil Flushing Completion	FIVE
Rolling & Synchronizing	SIX
Steam/ water system piping readiness	FIVE
Common system:	FIVE
Deaerator readiness	FIVE
BFP readiness	FIVE
Trial operation completion	SEVEN

**The Milestone dates for STG (Db. EXT) - Unit-2, 3 shall be with a lag of 2, 3 months respectively, w.r.t. UNIT# 1 STG milestone dates.**

<b>MILE STONES</b>	<b>MONTH</b>
Start of GT Erection	ZERO

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Oil flushing completion	FOUR
Ratcheting & Cranking	FIVE
FSNL & Synchronization	SIX
Trial operation completion # 1	SEVEN
The milestones GT/ GTG Set #2 shall follow with a time lag of one month, w.r.t. # 1 GT/ GTG milestone dates.	

**TOTAL SYSTEM COMPLETION**

**TEN**

**Note:** Contractor has to mobilize all required resources including manpower to achieve schedule given from time to time for which no compensation will be payable. However in case of contractor discharges his contractual responsibility even before schedule contract period, he will be allowed to wind up his set up without any financial implications on either side.

**In order to meet the Customer schedule, the Contractor may have to mobilize additional resources with three shift working to compress the schedule within the quoted price**

**58.4** The contractor has to ensure that work is completed in all respects leaving no pending points. However the punch list/ pending points, which are possible to be attended at site, shall be fully liquidated within two months from successful trial operation of the unit.

**58.5** The work under the scope of this contract is deemed to be complete in all respects, only when the contractor has discharged all the responsibilities laid down in the contract. The decision of BHEL on completion date shall be final and binding on the contractor.

**59.0 OVER RUN**

**59.1** In case due to reasons not attributable to the contractor, the work gets delayed and the scheduled completion gets extended, the contractor shall not be entitled for any over run compensation for a period of first 2 (TWO) months after the contractual completion date. In case the scheduled completion time gets extended beyond **2 (TWO) months** as stated above, the contractor shall be considered for payment of fixed over run charges, **@ Rs. 50,000/- per month (Rupees Fifty Thousand Only)** on receipt of advance notice intending to claim over run and on fulfilment of following conditions: -

1. The reasons for delay in completion of work are not attributable to contractor but however subject to the provisions of clause – 31.
2. Contractor achieves the targets fixed during the over run period.

**59.2** Once the claim of over run charges is admitted no other compensation whatsoever (like for delays in receipt of materials, availability of fronts etc.) will be entertained.

**59.3** The contractor shall maintain sufficient workforce and other resources required for completion of the job expeditiously for the entire contractual period including total extended period.

**60.0 TERMS OF PAYMENT**

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

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

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

**A) PROGRESSIVE PAYMENT ON PRORATA BASIS**

**AA) 85 % of Lump sum price (item No.1 of rate schedule)**

**TENDER NO. BHEL/NR/SCT/GGSRP-BATHINDA/GT,STG,BOPS&PIPING/623**  
**(Applicable on items covered under ANNEXURE – I)**

GT SYSTEM INCLUDING GT/ ACC. COMPARTMENT SKID, INTEGRAL PIPING, OIL SYSTEM, CO <sub>2</sub> SYSTEM, VENTILATION SYSTEM ETC.	2 x 4 %
GTG SYSTEM INCLUDING GENERATOR, EXCITER, LGB, GTG AIR COOLER UNIT, CO <sub>2</sub> SYSTEM, VENTILATION SYSTEM ETC.	2 x 4 %
INLET AIR SYSTEM INCLUDING INLET AIR FILTER, INLET AIR DUCTING, APU ETC.	2 x 3 %
EXHAUST SYSTEM INCLUDING BYPASS STACK, DIVERTOR/ GUILLOTINE DAMPERS, DUCTING ETC.	2 x 4 %
CONDENSER	2 x 3 %
STEAM TURBINE	3 x 6 %
STEAM GENERATOR	3 x 5 %
STATIC AND ROTARY EQUIPMENTS LIKE DEAERATOR, BOILER FEED PUMPS, AOP, MOP, JOP, CEP, ACW PUMPS, DM TRANSFER PUMPS, INJECTION / WATER WASH SKID, FUEL FORWRDING SKIDS, GAS CONDITIONING SKID, ETC.	16%
<b>TOTAL</b>	<b>85%</b>

**NOTES:**

1. The above break up is only for payment purposes and does not cover all equipment in the scope of the subject work. The total scope of work shall be as detailed in the tender specification.
2. Pro-rata payments shall be made every month in proportion to the work carried out by the contractor during the month, which shall be measured on the basis of percentages fixed above. The engineer shall carry out the assessment of the work for payment within the above percentages and it shall be final and binding on contractor. However, further percentage break up for payment against above clauses, will be mutually discussed and finalized at site

**AB) 85% OF UNIT RATE (ITEM NO 2 OF RATE SCHEDULE)**

15% of the Contract rate on pro-rata basis on completion of fabrication as per Drg., Edge preparation, pre-assembly wherever applicable and 15% of the contract rate on surface cleaning (shot blasting), providing Primer, as per specification, placement in position and rough alignment for the items .

**OR**

30% of the Contract rate on fabrication, pre-assembly, placement in position and rough alignment for the items where surface cleaning (shot blasting), providing Primer, as per specification, is not involved.

- a) 30% of the Contract rate on pro-rata basis on completion of final alignment/ fastening/ welding/ grouting along with proper supports.
- b) 25% of the Contract rate on pro-rata basis on system completion including radiography/ NDT/ Stress relieving wherever involved.

**AC) 85 % OF UNIT RATE (ITEM NO 3 OF RATE SCHEDULE)**

**TENDER NO. BHEL/NR/SCT/GGSRP-BATHINDA/GT,STG,BOPS&PIPING/623**

- a. **40%** of the Contract rate on pro-rata basis on fabrication, welding, cleaning and painting (as per specification).
- b. **45%** of the Contract rate on fixing of supports, welding, surface cleaning, primer & Final painting, installation and & completion of all jobs.

**AD) 85% OF UNIT RATE (ITEM NO 4 OF RATE SCHEDULE)**

- a. **40%** of the Contract rate on pro-rata basis on transportation/ fabrication/ fixing of retainers, lagging & stitching of mattresses and welding of retainers.
- b. **40%** of the Contract rate on fixing of casing supports, fabrication, beading, sealing, bitumen painting, installation and screen fixing of cladding & completion of all jobs
- c. **5%** of the Contract rate on Area cleaning

**B) PRE-COMMISSIONING & COMMISSIONING (8% of CV)**

Completion of Oil flushing.	5 x 0.3%
Completion of FSNL	2 x 0.3%
Completion of Steam rolling and synchronizing	3 x 0.3%
Completion of Trial operation	5 x 0.3%
Completion of alkali flushing of pre boiler system	6 x 0.2%
Completion of piping system for steam blowing	6 x 0.25%
Completion of piping system for NG fuel firing of UB	4x 0.2%

- C) **2.0%** of contract value Payable on pro-rata basis for 'PAINTING' **as per scope of work of this specification.**
- D) **2.5%** of contract value will be payable on handing over of the unit to BHEL's Customer or 3 months after contractor has discharged his responsibilities as stipulated in this contract, whichever is earlier, if delay in handing over is not attributable to contractor.
- E) the balance 2.5% CV shall be payable on completion of all pending work, rework wherever required, area cleaning, reconciliation of materials and fulfilment of contractual obligations.

**NOTE:** Payments at D & E above shall be released after adjustment of the CV based on actual work carried out.

**DETAILS OF MAJOR EQUIPMENT TO BE ERECTED, TESTED & COMMISSIONED**

**SUMMARY OF WEIGHTS(IN MT)**

<b>AA</b>	<b>TOTAL TENTATIVE WEIGHTS FOR ITEM NO 1 OF RATE SCHEDULE (GT/ GTG/ STG &amp; AUXILIARIES)</b>	<b>2908</b>
<b>BB</b>	<b>TOTAL TENTATIVE WEIGHTS FOR ITEM NO 2, 3 &amp; 4 OF RATE SCHEDULE (PIPING SYSTEM)</b>	<b>2000</b>

**DETAILS OF ITEM COVERED UNDER "AA"**

<b><u>AA-1 GAS TURBINE, GENERATOR &amp; AUXILIARIES (02SETS)</u></b>	<b>WT. (IN MT)</b>
TOTAL WEIGHT FOR ONE SET	561
TOTAL WEIGHT FOR TWO SET	1122
 <b><u>AA-2 COMMON SYSTEM EQUIPMENTS &amp; AUX.</u></b>	 <b>755</b>
 <b><u>AA-3 STEAM TURBINE,GEN. &amp; AUX.(DB. EXT.)</u></b>	
TOTAL WT. FOR ONE SET	433
TOTAL WT. FOR TWO SET	866
 <b><u>AA-4 STEAM TURBINE,GEN. &amp; AUX.(BK.PR.)</u></b>	
TOTAL WT. FOR ONE SET	165

**AA-1 TENTATIVE WT. & DIMENSION OF MAJOR COMPONENT FOR  
ONE GTG**

SI. NO	ITEM DESCRIPTION	QTY	LxWxH( in Mts.)	WT. IN KGS EACH	TTL WT. IN KGS
1	Gas Turbine package(flange to flange)	1	7.38X3.6 X3.93	64000	64000
2	GT off-base Enclosures	1	7.0 X3.0 X 3.0	75000	75000
3	Accessory Base	1	6 X3 X5	30000	30000
4	Load coupling	1	2.1X0.6X0.75	300	300
5	Exhaust frame blowers each (2nos)	1	3.0 X3.0 X1.5	2000	2000
6	Load coupling guard	1	2.2X1.5X1.0	220	220
7	GT walkways + ladders (Walk ways Split into pieces)	1	3.0X1.0X1.5	1500	1500
8	Diesel engine muffler	1	4.0X3.0X3.0	1500	1500
9	CO2 bottle racks	2	2.0 X1.0 X 1.0	1000	2000
10	Main filter house( will be shipped loose)	1	6.0 X3.0 X3.5	60000	60000
11	GTG air cooler / filter unit & duct	1	4.5x4.5x3.0	7000	7000
12	Turbine vent fans ( total 8 fans )	1	2.5 X2.5 X2	2000	2000
13	GT vent ducting	1	2.5X2.5X6.0	5000	5000
14	Air processing skid	1	3.0XX1.0 X2.5	1000	1000
15	Lube oil system for Warren pump	1	1.4 X1 X1.3	700	700
16	Lube oil centrifuge	1	3.0X1.5X1.8	1500	1500
17	Field Interconnecting piping	1	6.0X3.5X3.0	10000	10000
18	Foundation Bolts & Misc. Hardware	1		5000	5000
19	Accessory coupling	1	1.5X0.5X0.5	100	100
20	Accessory coupling guard	1	1.5X0.6X0.6	50	50
21	Air processing skid panel	1	3.0X0.5X2.0	200	200
22	APU cooler	1	3.0X0.5X2.0	500	500
23	Compressor water washing skid	1	6.5X3.0X3.2	5000	5000
24	Gas valve module	1	6.0X3.6X5	8000	8000
25	GT GENERATOR PACKAGE	2		70000	140000
25	INLET DUCTING CONSISTING OF:	1		25000	25000
	Inlet ducting transition pieces		4.0X4.0X3.0		
	Inlet duct expansion pieces		4.0X0.5X4.0		
	Inlet duct elbow no.1		4.0X4.0X4.0		
	Inlet duct elbow no.2		4.0X4.0X4.0		
	silencer		4.0X2.0X3.0		

**TENDER NO. BHEL/NR/SCT/GGSRP-BATHINDA/GT,STG,BOPS&PIPING/623**

	Straight duct no.1		4.0X3.0X3.0		
	Straight duct no.2		4.0X3.0X3.0		
	Support structure		6.0X3.0X3.0		
<b>26</b>	<b>EXHAUST DUCTING</b>	<b>1</b>			
	Transit Duct D2		4.7X4.3 X2.6	5100	5100
	Transit Duct D3		4.5X4.3X2.1	4100	4100
	Vertical duct VD8(04 nos)		4.3X4.3X3.3	4600	4600
	Vertical duct VD9		4.5X4.5X3.4	5000	5000
	Silencer duct SL1		4.7X5.1X3.2	10000	10000
	Silencer duct SL2		4.3X4.7X1.6	5100	5100
	Expansion Joints(04 nos)		4.4X4.0 X0.5	1200	1200
	Diverter damper		4 X4 X4	15000	15000
	Guillotine Damper		6 X0.4 X4	10000	10000
	Horizontal Duct D1		4.5X4.1 X3.8	9700	9700
	Horizontal Duct H1		4.1X2.5 X2.8	4600	4600
	Horizontal Duct D5		3.9X3.9X0.6	1800	1800
	Horizontal Duct D6		4.1X4.1X1.1	2900	2900
	Mark V1 turbine control panel		2.2X0.9X2.4	1700	1700
	GT battery charger dual FCBC		1.7X0.85X2.0	500	500
	GT DCDB,125 VDC	<b>1</b>	2.4X0.9X2.4	2800	2800
	Diverter damper local JB's(02 nos)		2.0X1.0X1.0	500	500
	Guillotine Damper local JB's (02 nos)		2.0X1.0X1.0	500	500
	GT MCC,415V,3PH,50HZ		13.98X0.9X2.4	10000	10000
	GT battery,125 VDC		5X0.4X1.4	1800	1800
	GT auxillary panel		1.0X0.8X2.4	250	250
	GT CO2 panel		0.8X0.4X2	150	150
	INLET AIR FILTER PANEL		0.66X0.25X1.0	500	500
	Stack support structure			10000	10000
	GD & GFD Seal air fan assy		3.0X2.0X2.0	1000	1000
	Lube oil mist eliminator		1.5X1.5X1.0	1000	1000
	Miscellaneous items (ladders, platforms, bolts)			4000	4000
	<b>TOTAL PER SET</b>			<b>561415</b>	

**AA-2 TENTATIVE WEIGHT & DIMENSIONS OF MAJOR COMPONENTS FOR COMMON SYSTEM EQUIPMENTS & AUXILIARIES**

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**TENDER NO. BHEL/NR/SCT/GGSRP-BATHINDA/GT,STG,BOPS&PIPING/623**

<b>Sl. NO:</b>	<b>ITEM DESCRIPTION</b>	<b>QTY</b>	<b>DIMENSION LxWxH Mts. in</b>	<b>WT. IN KGS EACH</b>	<b>TOTAL WEIGHT IN KGS</b>
1	Scrubber Skid for GT's	1	4 x 4 x 4	10000	10000
2	Scrubber Skid for HRSG's	1	3X2X4	5000	5000
3	Scrubber Skid for UB's	1	6X24X4	15000	15000
4	Filter Separator skid for GT's	2	5X24X4	6000	12000
5	30 M <sup>3</sup> drain tanks With drain pump	1	Dia 1.8 x 6.0	8000	8000
6	10 M <sup>3</sup> drain tanks With drain pump(for gas cond)	3	Dia 1.2 x 6.0	6000	18000
7	2 M <sup>3</sup> drain tanks With drain pump(for liquid fuel)	4	Dia 0.8 x 4.0	4000	16000
8	Accumulators in liquid fuel system	7	Dia 0.2 x2.0	500	3500
9	Vanadium inhibition skids( for LCO fuel)	2	3 x 2 x 2	2000	4000
10	HSD Centrifuge skid	1	4.0 x 4.0 x 3.0	5000	5000
11	HP nitrogen compressor	2	5.5 x 2.5 x 3	6000	12000
12	HP nitrogen receivers	4	Dia 1.5 x8.0	4000	16000
13	LCO forwarding skids for GT's (Each skid 2x100% pumps)	1	4.0 x 4.0 x 3.0	6000	6000
14	HSD forwarding skids for GT's (Each skid 2x100% pumps)	2	4.0 x 3.0 x 3.0	5000	10000
15	25micron filter skids	2	3 x 2 x 3	2000	4000
16	6 micron filter skids	2	3 x 2 x 3	2000	4000
17	LO skid for BFP's for UB	3	3x1.6x1	2000	6000
18	LO skid for BFP's for HRSGs	3	3x1.6x1	2000	6000
19	LO skid for Export feed water pump	2	3x1.6x1	2000	4000
20	LCO forwarding skids for HRSG's (Skid has two pumps)	1	4.0 x 4.0 x 3.0	6000	6000
21	LCO forwarding skids for UB's (Skid has two pumps)	1	4.0 x 5.0 x 3.0	8000	8000
22	Aux. CW pumps Aux. CW pumps(turbine driven-01 nos) Drive turbine for Aux. CW pumps	2 1 1	1 x 1 x 12 1 x 1 x 10 2.2x1x1.25	15000 1000 2000	30000 1000 2000
23	HP dosing system for UBs	1	9 x 2.5 x 4.5	10000	10000
24	LP dosing system(hydrazine) for de-aerator	1	9 x 2.5 x 4.5	8000	8000
25	LP dosing system(ammonia) for de-aerator	1	4 x 2.5 x 4.5	5000	5000
26	LP dosing system(ammonia) for condensate storage tank	1	3 x 2.5 x 4.5	4000	4000
27	Flash tanks(for UB's)	4	Dia 1.5 x 3	2000	8000
28	BFPs with drive motors for HRSGs	3	6.0 x 2.0x 2.0	16000	48000
29	BFPs with drive motors & turbine driven(01 nos) for UBs	3 1	8.0 x 2.5x 2.5 8.0 x 2.5x 2.5	20000 15000	60000 15000
30	Export feed water pumps (MP)	2	5.0x2.0x2.0	12000	24000

**TENDER NO. BHEL/NR/SCT/GGSRP-BATHINDA/GT,STG,BOPS&PIPING/623**

31	Side stream filtration pumps with motors	2	0.6x0.6x10	4000	8000
32	Condensate transfer pumps to de-aerator with motors	2	4.x2.5x1.0	6000	12000
33	LP heater condensate Drain transfer pumps	2	4.x1.5x1.0	2000	4000
34	Blow down transfer pumps	10	0.75x0.75x 5.5	15000	150000
35	Make-up water booster pumps	3	5.5x2.0x1.0	8000	24000
36	MUH transfer pumps with motors	2	4.5x1.5x1.0	3000	6000
37	Condensate extraction pumps with motors	4	0.75x0.75x 5	2000	8000
38	Dewatering pumps	4	0.5x0.5x 0.55	150	600
39	Cooling water pumps for black start	2	2.0x1.0x1.0	2000	4000
40	DM water pumps for atomizing air pre-cooler of GT	4	12.0x1.0x1.0	600	2400
41	condensate Drain transfer pumps -for BFP drive turbine	2	1.5 x 1 x 1	250	500
42	condensate Drain transfer pumps -for back pressure STG	02	1.5 x 1 x 1	250	500
43	DG Set with auxiliaries				
					<b>613500</b>
44	<b>Spray cum Tray Deaerator</b>				<b>141650</b>
	Header	1			
		1	L 9.4 x W 3650	20200	
		1	x H 3650		
	Feed Storage Tank (Sec-I)	1	L 11.3 x W	23200	
		1	4350 x H 4600		
	Feed Storage Tank (Sec-II) 1 no.		L 10.5 x W	22250	
		1	4350 x H 4600		
	Feed Storage Tank (Sec-III) 1 no.		L 12.5 x W	26150	
			4350 x H 4600		
	Feed Storage Tank (Sec-IV) 1 no.		L 10.5 x W	22000	
			4350 x H 4600		
	Feed Storage Tank (Sec-V) 1 no.		L 11.3 x W	22850	
			4350 x H 4600		
	Loose items (for Stand pipes, Platform etc) 1 set			5000	
	<b>TOTAL WT. for COMMON SYSTEM EQUIPMENTS &amp; AUXILIARIES</b>				<b>755150</b>

**AA-3 TENTATIVE WEIGHT & DIMENSIONS OF MAJOR COMPONENTS FOR ONE STG SET.**

Sl.No	Equipment Description	Qty (in nos)	Dimension each	Wt. Each (KG)	Remarks
1.	Double extraction condensing type Steam Turbine	2	5800X5200X4800	58000	116000
2.	Surface condenser				
a.	Shell Assly (with shell, tube sheet, support plates,	1	L 7100 x W 4000 x 4300	35000	35000

**TENDER NO. BHEL/NR/SCT/GGSRP-BATHINDA/GT,STG,BOPS&PIPING/623**

	spacers etc)				
<b>b</b>	Hot Well Assly 1 no.	1	L 2000 x W 2400 x H 1900	3000	3000
<b>c.</b>	Tubes 6500 nos		OD 19.05 x 16BWG x L 4500	3.475	22588
<b>d.</b>	Misc (Stand pipes, surge pipes etc) - 1 no.	<b>1</b>		2000	2000
<b>3.</b>	<b>Steam Jet Air ejector .</b>	<b>2</b>	L 6100 x W 1000 x H 1500	3600	7200
<b>a.</b>	Misc ( Starting ejector)	<b>1</b>		300	300
<b>4.</b>	<b>Gland Steam Condenser</b>		Ø 610 x L 3600	1600	1600
<b>a.</b>	GSC Ejector assembly	1	L 2700 x W 1200 x B 1200	300	300
<b>b.</b>	Cond. collection tank	1	Ø 1100 x H 2000	1000	1000
<b>5.</b>	<b>ST oil Cooler</b>	<b>2</b>	Ø 610 x L 4600	3700	7400
<b>6.</b>	<b>Compressor Lube oil Cooler</b>	<b>2</b>	Ø 350 x L 3500	1200	2400
<b>7.</b>	<b>Bypass Cooler</b>	1	L 4200 x W 700 x H 1200	3500	3500
	<b>LP Heater</b>	1	L 14000 x W 1300 x H 1400	21000	21000
	b. Misc (Stand pipes etc) - 1 set.			800	800
<b>8.</b>	<b>Condensate collection tank for LP Heater</b>	<b>1</b>	L 7000 x W 1600 x H 2000	5100	5100
<b>9.</b>	<b>STG Air Cooler</b>	<b>9</b>	L 4300 x W 700 x H 450	960	8640
<b>10.</b>	<b>Water to Water Heat Exchanger</b>	<b>1</b>	L 5400 x W 700 x H 1100	3400	3400
<b>11.</b>	<b>CBD Tank</b>	<b>4</b>	Ø 1500 x H 3350	4000	16000
<b>12.</b>	<b>IBD Tank</b>	<b>4</b>	Ø 1500 x L 4600	4000	16000
<b>13.</b>	<b>Speed reduction Gear box</b>		2200X2100X2000	10000	10000
<b>14.</b>	<b>LUBE OIL SYSTEM including</b>			25000	25000
	Main oil tank Over head oil tank Main oil pump Aux. Oil pump				

**TENDER NO. BHEL/NR/SCT/GGSRP-BATHINDA/GT,STG,BOPS&PIPING/623**

	Emergency oil pump Jacking oil pump with AC motor Duplex filter for lube oil Trans flow valves for duplex filters Oil cooler (02 nos) Vent & drain valves for oil coolers Oil mist fan with AC motor 2X100% Complete lube oil piping Complete control oil piping Oil accumulator Oil purifying system				
15.	<b>Coupling</b>	1	1000X600X600	500	500
16.	<b>ST GENERATOR PACKAGE</b>	2		70000	140000
	<b>TOTAL WT.</b>				<b>432728</b>
<b><u>AA-4 TENTATIVE WT. &amp; DIMENSION OF ONE STEAM TURBINE(BACK PRESSURE)</u></b>					
1.	<b>Back-pressure Steam turbine</b>	1	5000X4000X4200	45000	45000
2.	<b>Gland Steam Condenser Assly.( with Ejector and Cond. Collection tank)</b> a. Gland steam Condenser 1 no. b. GSC Ejector assly 1 no. c. Cond. collection tank 1 no.		Ø 610 x L 3600 L 2700 x W 1200 x B 1200 Ø 1100 x H 2000	1600 300 1000	1600 300 1000
3.	<b>ST oil Cooler (For Back Pressure Turbine 1 nos.</b>		Ø 610 x L 4600	3700	3700
4.	<b>STG Air Cooler (Back Pressure) 8 nos.</b>		L 4300 x W 700 x H 450	960	7680
5.	<b>Speed reduction Gear box</b>		2200X2100X2000	10000	10000
6.	<b>LUBE OIL SYSTEM including</b>			25000	25000

**TENDER NO. BHEL/NR/SCT/GGSRP-BATHINDA/GT,STG,BOPS&PIPING/623**

	Main oil tank Over head oil tank Main oil pump Aux. Oil pump Emergency oil pump Jacking oil pump with AC motor Duplex filter for lube oil Trans flow valves for duplex filters Oil cooler (02 nos) Vent & drain valves for oil coolers Oil mist fan with AC motor 2X100% Complete lube oil piping Complete control oil piping Oil accumulator Oil purifying system				
7.	<b>Coupling</b>	1	1000X600X600	500	500
8.	<b>ST GENERATOR PACKAGE</b>	1		70000	70000
	<b>TOTAL WT.</b>				<b>164780</b>

<b>B</b>	TENTATIVE LIST OF PIPING SYSTEM
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- Gas fuel system
- Fuel Oil Piping
- LCO piping
- HSD piping
- Feed water system
- Condensate system
- VHP STEAM PIPING
- HP steam piping
- MP steam piping
- LP steam piping
- Cooling water system
- Instrument/service air system
- Miscellaneous piping
- CW Piping

## TENDER NO. BHEL/NR/SCT/GGSRP-BATHINDA/GT,STG,BOPS&PIPING/623

### NOTE:

- a) All the above systems of piping include the erection of pipes, bends, valves, fittings, impulse piping and including root valves, sampling lines, drains, hangers and supports & other accessories so as to make the systems complete in all respect.
- b) Above system of piping can be regrouped / renamed or any addition / deletion in the system can be made in order to make system complete as per requirement. No extra cost shall be entertained on this account.
- c) The piping systems mentioned above are only indicative and does not cover all the piping systems to be erected / commissioned. Contractors are however required to erect commission all piping systems shown in drawings & other documents which may be necessary for erection, completion & overall commissioning of Cogeneration plant at the accepted unit rates.
- d) Piping systems required for commissioning of HRSG / UTILITY BOILERS have to be completed to suit BHEL requirements.
- e) The tonnages indicated are tentative only and may vary during execution of work. The contractor is required to erect / commission all piping systems shown in drawings and documents which may be necessary for overall commissioning of both open cycle operation of GT & combined cycle operation of STG/ GTG/ UTILITY BOILER / HRSG. Payment shall be released on the basis of actual work executed as per final accepted rates.
- f) Pipes are supplied in standard commercial lengths without edge preparation.
- g) In CS Piping, Mitre Bends, Reducers to be fabricated at Site from supplied pipe in 32", 34", 48", 58".
- h) Bidders may note above while quoting / accepting tonnage rates for subject work.
- i) Surface cleaning/short blasting as per specification
- j) **For underground piping coal tar tape (supply & applications), fabrication of mitre bends, reducers, pipe to pipe joints is in the scope of contractor if required.**

**TENDER NO. BHEL/NR/SCT/GGSRP-BATHINDA/GT,STG,BOPS&PIPING/623**  
**Annexure-II**

LIST OF STANDARD SPECIFICATIONS

<b>S.NO</b>	<b>TITLE</b>	<b>NO OF SHEETS</b>
1.	STANDARD SPECIFICATIONS FOR HOT INSULATION OF VESSELS, PIPING & EQUIPMENTS. (6-44-0002, REV4)	53
2.	WELDING CHARTS (6-77-0005, REV4)	30
3.	STANDARD SPECIFICATIONS FOR FABRICATION & ERECTION OF PIPING (6-44-0012, REV2)	13
4.	STANDARD SPECIFICATIONS FOR INSPECTION, FLUSHING AND TESTING OF PIPING SYSTEM (6-44-0013, REV3)	09
5.	STANDARD SPECIFICATIONS FOR APPLICATION OF TORQUE & HYDRAULIC BOLT TENSION FOR FLANGED JOINTS (6-76-0002, REV0)	27
6.	STANDARD SPECIFICATIONS FOR STEAM TRACING (6-44-0007, REV2)	18
7.	TECH. NOTES FOR VALVES (6-44-0052, REV4)	11

List of P&ID Drawings

S.NO	TITLE	NO OF SHEETS
1.	VHP steam model 1-381-01-03143	02
2.	HP steam model 1-381-01-03144	02
3.	MP steam model 1-381-01-03145	01
4.	LP steam model 1-381-01-03146	01
5.	Condensate system up to hot well 1-381-01-03147	01
6.	Condensate system up to CST to deaerator 1-381-01-03148	01
7.	Feed water system 1-381-01-03149	03
8.	HP_MP_extractions STG 1-381-01-03156	01
9.	UB blowdown system 2-381-01-00862	01

**LIST OF T&P and IMTEs being provided by BHEL for use of contractor free of hire charges on sharing basis.**

Equipment	Capacity	Qty.
Crawler crane	100 T	1No.
Motorised Hydro test pump set	600 kg	1No
Chemical cleaning pump skid		1 set

**NOTE:**

- 1) Any other special T&P if supplied by Manufacturer will also be provided free of hire charges as and when made available. These special tools & tackles are to be used only for the purpose for which these are meant and are to be required to be returned in good condition as and when required by BHEL.
- 2) Other terms & conditions regarding above items shall be as per clause no 38 (T & P/ IMTE's)
- 3) One no 20/5 MT EOT crane will be erected / commissioned by another agency and may become operational any time during the period of subject work. This EOT crane will also be provided by BHEL free of hire charges & on sharing basis for subject work. The maintenance of EOT crane will be carried out by BHEL / its Client. Experienced operators as per requirement shall be deployed by the contractor for operation of EOT crane at no extra cost to BHEL. However contractor will not be entitled for any compensation due to non-availability of EOT crane.

**TENDER NO. BHEL/NR/SCT/GGSRP-BATHINDA/GT,STG,BOPS&PIPING/623**  
**Annexure-V**

<b>INDICATIVE LIST OF MAJOR T&amp;P TO BE PROVIDED BY CONTRACTOR AT HIS OWN COST.</b>			
<b>S.NO.</b>	<b>EQUIPMENT</b>	<b>CAPACITY</b>	<b>MIN QTY</b>
	Welding Generators, Transformers, Rectifiers And TIG Welding Machine		Adequate numbers.
	Mobile crane	36 / 40 T	1 No
	Mobile crane( Tyre mounted)	18 / 20 T	2 No
	Plasma cutting machine		1 No
	Trailer with Pulling Unit	10 / 20 / 30 MT	2 No
	Hydra	10 / 14 MT	2 No
	Hydraulic Jack (Low Height)	25/50/100T	Adequate numbers.
	Screw Jacks	5/10/25/50T	Adequate numbers.
	Hydraulic Pipe Bending Machine (Manual and Motorised )		1 number each .
	Stress Relieving Sets, including oil cooled transformers, heating coils, panels Recorders Etc.		Adequate numbers.
	Vacuum Cleaner (Industrial)		1 number.
	Surface Grinder and other Workshop Equipment		1 set.
	Electric Winches		As per requirement
	Torque Tension Meter/ Wrench		As per requirement
	Electronic/ Electrical Tube Expander (With Tools)		2 number.per Unit APR
	Tube& pipe chamfering/Edge preparation machine		2 number
	Slings, sleepers, rail, winches etc.		As per requirement
	Hydraulic test pump (manual).		As per requirement
	The above list specifies only major T&P (may not be complete to be deployed by the contractor). All additional/ other tools and plants which are required for satisfactory & timely completion of work shall also be deployed by the contractor within finally accepted rate/ price.		
	Other terms and conditions regarding above items please also refer clause 38 (T&P/ IMTEs) APR- as per requirement		

**TENDER NO. BHEL/NR/SCT/GGSRP-BATHINDA/GT,STG,BOPS&PIPING/623**  
**Annexure-VI**

<b>TENTATIVE LIST OF MAJOR TESTING INSTRUMENTS / EQUIPMENT TO BE ARRANGED BY CONTRACTOR AT HIS OWN COST.</b>				
<b>SL. No.</b>	<b>DESCRIPTION</b>	<b>RANGE</b>	<b>ACCURACY</b>	<b>QTY</b>
	Hand operated Megger	Up to 200 M ohms 500V/ 1000V	±5% at center scale ±10% at end of scale	2 No.
	Digital Multimeter 3½ digit	Voltage 200 mV to 1000V	±1%+1 digit	2 No.
		Current 200 mA to 10A DC	±0.8%+1 digit	
		Current 20 mA to 20A AC	±0.8%+1 digit	
		Resist 200 ohms to 20M ohms	±0.5%+1 digit	
	Dumpy level	0 to 350 mm	LC-0.01	1 No.
	Surface plate	Up to 1.0 Sq. Mtr	Grade 1,2,3	2 No
	Straight Edge	Up to 2 Mtr long	Grade 1,2,3	1 No.
	Temperature recorder for 0-1000C 6/12 points with thermo couples / rods and compensating cable			2 Sets
	Master pressure gauge	0 – 4 Kg/cm <sup>2</sup>	0.02	1 No.
	Tachometer	0-4500 RPM		1 No.
	Digital tong tester	0-300A AC&DC		1 No.each
	DC power source	30V/50ma		1 No.
	Digital Alcometer			2 nos
<b>NOTES:</b>				
	The above list of testing instruments/ equipment required for testing/ commissioning is only for guidance to contractor and not complete. Any other/ additional testing instruments/ equipment required for timely and satisfactory completion of job will also be arranged by contractor at his own cost.			
	Contractor must re-ascertain/ recheck range and accuracy of each IMTE from BHEL Engineer well in advance before arranging calibration/ deployment.			
	Other terms and conditions regarding above items shall be as per clause no. 38 (tools & plants/ testing & measuring instruments).			

Annexure-VII

**CERTIFICATE OF DECLARATION FOR CONFIRMING THE KNOWLEDGE OF SITE CONDITIONS (Please refer Clause 57.0)**

We, -----

Hereby declare and confirm that we have visited the project site under the subject namely, ----- and acquired full knowledge and information about the site conditions and work involved. We further confirm that the above information is true and correct and we will not raise any claim of any nature due to lack of knowledge of site conditions.

Tenderers Name and Address

Place:

(Signature of the Tenderers  
with stamp)

Date:

**NON DISCLOSURE AGREEMENT  
Memorandum of Understanding**

BHEL PSNR is committed to Information Security Management System as per Information Security Policy.

M/s ....., providing ..... service to BHEL PSNR, Noida hereby undertake to comply with the following in line with Information Security Policy of BHEL PSNR;

- To maintain confidentiality of documents & information which shall be used during the execution of the Contract.
- The documents & information shall not be revealed to or shared with third party which shall not be in the business interest of BHEL PSNR.

(  
M/s. BHEL, PSNR )

(  
M/s..... )

**FORMAT OF UNDERTAKING**  
**(To be submitted in the bidder's letter head)**

**REF:**

**Dt.**

**Bharat Heavy Electricals Limited**  
**Power Sector – Northren Region,**  
**Plot No. 25 , Sector - 16A ,**  
**Distt. Gautam Budh Nagar,**  
**NOIDA – 201 301. INDIA**

**Subject:** Erection, testing, commissioning and trial operation of and handing over of 2X36 MW STG (Db Ext), 1X32 MW STG (Bk Pr) with auxiliaries, 2XFr-6 GT/ GTG with auxiliaries, all Related Pumps and Piping for 153 MW, CPP of Guru Gobind Singh Refineries Project, Bathinda of HPCL Mittal Energy Ltd.

Dear Sirs,

With reference to above, this is to confirm that as per tender conditions, we have visited GGSRP Bathinda site before submission of our offer and noted the job content & site conditions etc.

We also confirm that we have not changed/ modified the tender documents as appeared in the website and in case of observance at any stage, it shall be treated as null and void. We hereby confirm that we have not taken any deviation from tender clauses together with other references as enumerated in the above referred NIT and confirm our acceptance to reverse auctioning process and we hereby convey our unqualified acceptance to all terms and conditions as stipulated in the tender and NIT. In the event of observance of any deviation in any part of our offer at a later date whether implicit or explicit, the deviations shall stand null & void.

We confirm to have submitted offer strictly in accordance with tender instructions.

Thanking you,

Yours faithfully,

(Signature, date & seal of authorized  
representative of the bidder)

**TENDER NO. BHEL/NR/SCT/GGSRP-BATHINDA/GT,STG,BOPS&PIPING/623**  
**Annexure-X**

**FORMAT FOR NO DEVIATION CERTIFICATE**  
**(To be submitted in the bidder's letter head)**

REF:

Dt.

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

**Sub:** No Deviation Certificate for the work of Erection, testing, commissioning and trial operation of and handing over of 2X36 MW STG (Db Ext), 1X32 MW STG (Bk Pr) with auxiliaries, 2XFr-6 GT/ GTG with auxiliaries, all Related Pumps and Piping for 153 MW, CPP of Guru Gobind Singh Refineries Project, Bathinda of HPCL Mittal Energy Ltd.

**TENDER NO. BHEL/NR/SCT/GGSRP-BATHINDA/GT,STG,BOPS&PIPING/623**

Dear Sirs,

With reference to above, this is to confirm that as per tender conditions, we have visited site before submission of our offer and noted the job content & site conditions etc. We also confirm that we have not changed/ modified the tender documents as appeared in the website and in case of observance at any stage; it shall be treated as null and void. We hereby confirm that we have not taken any deviation from tender clauses together with other references as enumerated in the above referred NIT and confirm our acceptance to reverse auctioning process and we hereby convey our unqualified acceptance to all terms and conditions as stipulated in the tender and NIT. In the event of observance of any deviation in any part of our offer at a later date whether implicit or explicit, the deviations shall stand null & void.

We confirm to have submitted offer strictly in accordance with tender instructions.

Thanking you,

Yours faithfully,

(Signature, date & seal of authorized  
representative of the bidder)

**FORMAT FOR E-PAYMENT DETAILS: - BHEL-PSNR-NOIDA**

(To be given in Company letterhead)

**Beneficiary Name** :

**Bank Name & Branch** :

**MICR Code (9 Digits)** :

**IFSC CODE** :  
**(VALID FOR NEFT)**

**Beneficiary Account No.** :

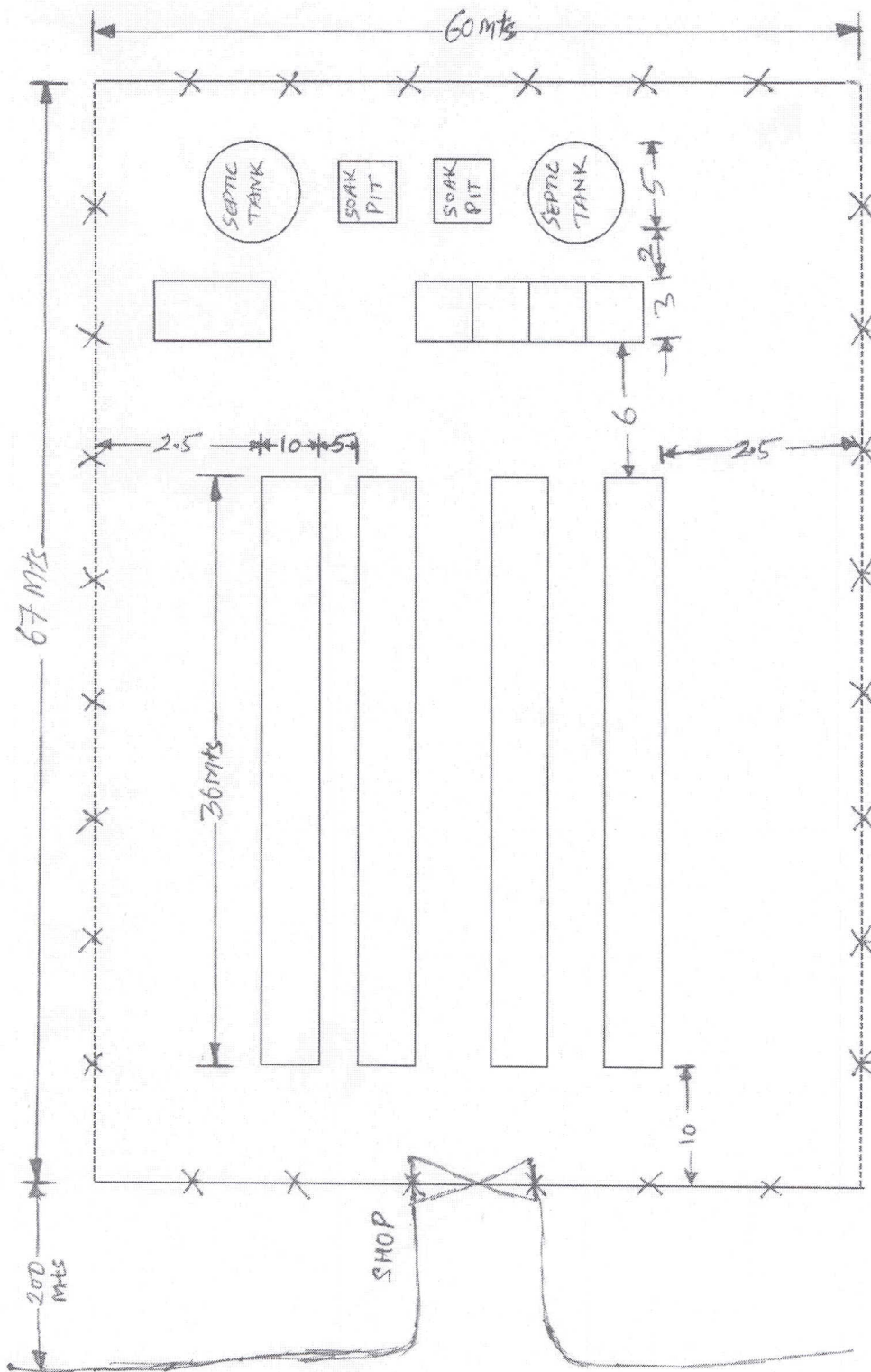
**Beneficiary E-mail ID** :  
**(for payment confirmation)**

**GENERAL TERMS AND CONDITIONS OF REVERSE AUCTION (RA)**

Against this enquiry for the subject item/ system with detailed scope of supply as per our tender specification, BHEL-PSNR, NOIDA may resort to "REVERSE AUCTION PROCEDURE" i.e. **ONLINE BIDDING on INTERNET.**

1. For the proposed reverse auction, technically and commercially acceptable bidders only shall be eligible to participate.
2. BHEL will engage the services of a service provider who will provide all necessary training and assistance before commencement of on line bidding on Internet.
3. In case BHEL decides to conduct reverse auction, BHEL's service provider shall contact the vendor directly and impart them the training.
4. Business rules like event date, time, start price, bid decrement, extensions, etc. also will be communicated through service provider for compliance.
5. Vendors have to fax the compliance form in the prescribed (provided by service provider) before start of Reverse auction. Without this the vendor will not be eligible to participate in the event.
6. BHEL will provide the calculation sheet (e.g.: EXCEL sheet) which will help to arrive at "Total Cost to BHEL" like packing & forwarding charges, Taxes and duties, Freight charges, Insurance, Service tax for services and loading factors (for non-compliance to BHEL standard Commercial terms and conditions.) for each the vendor to enable them to fill-in the price and keep it ready for keying in during the auction.
7. Reverse auction will be conducted on schedule date & time.
8. At the end of reverse auction event, the lowest bidder value will be known on the network.
9. The lowest bidder has to fax the duly signed filled-in prescribed format as provided on case-to-case basis to BHEL through service provider within 24 hours of auction without fail.
10. Any variation between the on-line bid value and signed document will be considered as sabotaging the tender process and will invite disqualification of vender to conduct business with BHEL as per prevailing procedure.
11. In case BHEL decides not to go for Reverse auction procedure for this tender enquiry, the price bids and price impacts, if any already submitted and available with BHEL shall be opened as per BHEL standard practice.

SKETCH FOR LABOUR CAMP



**LIST OF HEALTH SAFETY & ENVIRONMENT (HSE) DOCUMENTS**

<b>S. NO.</b>	<b>TITLE</b>	<b>NO. OF SHEETS</b>
1.	HSE MANAGEMENT DURING CONSTRUCTION	1-5
2.	STANDARD SPECIFICATIONS FOR HSE MANAGEMENT AT SITE (SPEC. NO. 6-82-0001)	6-55
3.	SAFETY PRACTICES DURING CONSTRUCTION (OISD – GDN – 192)	56-102
4.	CONTRACTOR SAFETY (OISD – GDN – 207)	103-144
5.	INSPECTION & SAFE PRACTICES DURING ELECTRICAL INSTALLATION (OISD – RP – 147)	145-170
6.	SAFETY REGULATIONS FOR CONTRACTORS	171-201

TENDER NO. BHEL/NR/SCT/GGSRP-BATHINDA/GT,STG,BOPS&PIPING/623

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## TENDER SPECIFICATION

TENDER NO. BHEL/NR/SCT/GGSRP-BATHINDA/GT,STG,BOPs&PIPING/623

FOR

Erection, testing, commissioning and trial operation of and handing over of  
2X36 MW STG (Db Ext), 1X32 MW STG (Bk Pr) with auxiliaries, 2XFr-6  
GT/GTG with auxiliaries, all Related Pumps and Piping for 153 MW, CPP of  
Guru Gobind Singh Refineries Project, Bathinda of HPCL Mittal Energy Ltd

PART II – PRICE BID



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

**RATE SCHEDULE**

Sl. No	DESCRIPTION OF WORK	Unit Rate in Rs. (In figures and words)	TOTAL VALUE in Rs. (In figures and words)
1.	Lump sum price for complete scope of work as per tender specification for items indicated under <b>Annexure-I Item AA for 2 X 36 MW STG (Db Ext), 1X32 MW STG (Bk Pr), 2XFr-6 GT/ GTG including auxiliaries &amp; common system equipments &amp; auxiliaries. (Items as per Item AA of Annexure- I)</b>		
2.	Rate in Rs./ MT for complete scope of work as per tender specification for piping systems indicated <b>under Annexure- I item – BB</b>		
A	Carbon steel piping system <b>(Approx. 1,250 MT)</b>		
B	Alloy steel piping system <b>(Approx. 620 MT)</b>		
C	Stainless steel piping system <b>(Approx. 60 MT)</b>		
3.	Rate in Rs/ MT for fabrication and installation of additional platforms, structures, ladders and H&S (which are not indicated in the drawings)as per site requirement <b>(Approximately 40 MT)</b>		
4.	Rate in Rs./ MT for complete work as per tender specification for application of insulation of piping system (Item 2 of Rate schedule). <b>(Approximately 30 MT)</b>		
	<b>TOTAL VALUE</b>		

**NOTE:**

- Above details are only to give a general idea to the contractor to quote the lump sum price for Item No 1 of rate schedule.
- Above system can regrouped/ renamed or any addition/ deletion can be made to make system complete. No extra claim shall be entertained on this account.
- Equipment and piping systems indicated above are only major items & does not cover all the equipment/ piping system being supplied GT/ GTG packages and are required to be erected/ commissioned under this contract. Contractor is however required to erect/ commission within the price quoted by them, all connected equipment/ system shown in manufacturer's drawings/ other documents which may be necessary for erection completion & overall commissioning of GTG sets.
- Systems required for commissioning of HRSG/ UTILITY BOILERS have to be completed to suit BHEL requirements
- The piping system includes pipe, bends, fitting etc. to make the system complete in all respect & payment will be released for above items as per applicable rates against rates for Item No 2 of Rate schedule, as applicable. The additional structure & platforms required for

**TENDER NO. BHEL/NR/SCT/GGSRP-BATHINDA/GT,STG,BOPS&PIPING/623**

completion of piping systems will be payable as per rates against item No. 4 of Rate schedule.

- The quantities indicated above are tentative and are liable to vary depending upon the site requirement. The contractor has to handle/ erect/ commission all the items indicated by BHEL for achieving the milestones and completion of work.
- The contractor while quoting the above rates, categorically confirms having understood the fullest implications of price variation provisions contained in clause no 53 of tender. Accordingly taking into consideration all aspects thereof quoted above rates. Further contractor confirms that he will not come with any other claim/ compensation on account of any increase whatsoever during the entire period of execution including extended period if any.
- The rate shall be entered in figures as well as in words. In case of difference in rates between words and figures, the lesser of the two will be treated as valid rate.
- In case of omission in quoting any rate, the evaluation will be done considering the highest quoted rate obtained against that item. But the work, if awarded, will be on the lowest quoted rate obtained against that item.
- Pipes are supplied in standard commercial lengths without edge preparation.
- In CS Piping, Mitre Bends, Reducers to be fabricated at Site from supplied pipe in 32", 34", 48", 58".
- For underground piping coal tar tape (**supply & applications**), fabrication of mitre bends, reducers, pipe to pipe joints is in the scope of contractor. The laying & burying will be in the scope civil contractor.
- The Rate shall be entered in figures as well as in words. In case of difference in rates between words and figures THE LESSER OF THE TWO will be treated as valid rate.
- In case of omission in quoting any rate, the evaluation will be done considering the highest quoted rate obtained against that item but the work, if awarded, will be on the lowest quoted rate obtained against that item.
- The bidders shall enter both 'Unit Rate' & 'Amount'. In case of any mismatch between 'Total Amount based on Unit Rate' & 'Total Amount as quoted', the higher of the two shall be considered for evaluation and the lower of the two shall be considered for award.

(Seal and Signature of Tenderer)