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T E N D E R S P E C I F I C A T I O N

TENDER NO. BHEL:NR:SCT:BSR:U 1 & 2:ECNI:503

FOR

ERECTION, TESTING, COMMISSIONING AND TRIAL OPERATION OF ELECTRICAL, CONTROL & INSTRUMENTATION PACKAGES FOR 2X125 MW BARSINGSAR TPS PROJECT (UNIT NO.1&2) OF NEYVELI LIGNITE CORPORATION LTD AT BARSINGSAR, BIKANER, RAJASTHAN.

PART I – TECHNICAL BID

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

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

Bharat Heavy Electricals Limited
(A Govt. Of India Undertaking)
Power Sector – Northren Region,
Plot No. 25 , Sector - 16A ,
Distt. Gautam Budh Nagar, NOIDA – 201 301.INDIA
Phone: 0091-0120-2515476 / 2515464 / 2515479
Fax 091-0120-2515464 / 2515467
Email: sku@bhelpsnr.co.in / msd@bhelpsnr.co.in

TENDER NO. BHEL:NR:SCT:BSR:U 1 & 2:ECNI:503

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----------

INDEX

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

Bharat Heavy Electricals Limited
(A Govt. Of India Undertaking)
Power Sector – Northren Region,
Plot No. 25 , Sector - 16A , Noida
Distt.Ghaziabad, NOIDA – 2 01301.INDIA
Phone: 0091-0120-2515476 / 2515464 / 2515479
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Email: sku@bhelpsnr.co.in / msd@bhelpsnr.co.in

TENDER NOTICE

Sealed tenders are invited from the contractors fulfilling qualifying requirements for the "Work of erection, testing, commissioning, post commissioning, trial operations and handing over of all ELECTRICAL, CONTROL & INSTRUMENTATION equipments for 2 x 125 MW, Unit 1 & 2 at Barsingsar Thermal Power Project of Neyveli Lignite Corporation Ltd. at Barsingsar, Bikaner, Rajasthan."

TENDER NO. BHEL:NR:SCT:BSR:U 1 & 2:ECNI:503

QUALIFYING REQUIREMENTS:

(i) **Bidders should have executed similar nature electrical works consisting of 6.6 kV or higher rating switch gear, LT service transformers (Dry/ oil cooled type) 6.6/ 0.4 kV or higher rating, segregated phase bus duct of 6.6 kV or higher rating in Power/ Nuclear/ Industrial Projects during last seven years.**

(ii) **Bidders should have executed similar nature C&I works consisting of Boiler and Turbine Control panels and related field instrumentation works in Power/ Nuclear/ Industrial Projects during last seven years.**

(iii) **Party should also have an average annual turnover of minimum of Rupees 225 Lacs (Rupees Two Hundred Twenty Five Lacs Only) during preceding three years (2004-05, 2005-06, and 2006-07).**

(iv) **Tie up arrangements:**
Bidders are allowed to have tie up/ JV arrangement for the work, which is not executed by them against Qualifying Requirements at Sl. No. 1 and 2. The composition of tie up arrangement and role and responsibility of each constituent must be well defined and the document submitted shall clearly indicate who shall be the lead partner. The bidder shall give an undertaking that the responsibility of execution of entire work shall lie with the lead partner and that in case of dissolution of tie up/ JV, the lead partner shall be liable for completing the work as per the terms of contract without affecting the Project Schedule and that the lead partner shall have to make immediate alternate tie up/ JV arrangement with another party meeting the QR requirement of the NIT (subject to BHEL's approval). In case the same is not arranged, BHEL will be free to get the work done through alternate source at their (contractor's) risk and cost.

Note: The turn over shall be considered of the lead-partner only and not of the agency with whom they may have tie up.

(v) **Bidders selection is subject to approval of BHEL's customer for this work i.e. M/s NEYVELI LIGNITE CORPORATION LTD (M/s NLCL).**

NOTES:

(i) The Tender Documents comprises of following:
   (a) General Conditions of Contract
   (b) Special Conditions of Contract, Tender Notice, Project Synopsis etc.
   (c) Rate Schedule

(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.1000/- (Rupees One thousand only) in the form of crossed demand draft (non-refundable), in favour of BHEL, NOIDA along with their offer

(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 14.05.2008*** 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 **latest by 14*.05.2008*** before opening of technical bids commences. Technical bids shall **be opened at 15.30 Hrs. on 14*.05.2008***.

(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) Tenders not accompanied with Full Earnest Money Deposit, as indicated above, will not be considered.

(vii) 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.

(viii) BHEL reserves the right to accept or reject any or all tenders without assigning any reason whatsoever.

(ix) **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 (Complete)
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.

(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

I

SO 9001-2000,ISO 14001 and OHSAS 18001 certified company

SubContract and Purchase Deptt.

Bharat Heavy Electricals Limited
(A Govt. Of India Undertaking)
Power Sector – Northren Region,
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DOMESTIC NOTICE INVITING TENDER

LAST DATE OF SALE : 14.05.2008
DATE OF OPENING (Tech. Bids) : 14.05.2008
NIT NO. / NAME OF WORK

Tender No. BHEL:NR:SCT:BSR:U 1 & 2:ECNI:503

Sealed tender are invited from the contractors fulfilling qualifying requirements for "**work of erection, testing, commissioning, post commissioning, trial operations and handing over of all ELECTRICAL, CONTROL & INSTRUMENTATION equipments** for 2X125 MW Units (Unit No.1 & 2) at Barsingsar TPS, BIKANER, RAJASTHAN".

NOTES:

1. Purchase Preference will be given to CPSU as per Govt. Guide lines.
2. Please visit our website at www.bhel.com for details of NIT including Qualifying Requirements.
3. Tenders Not Accompanied With Full Earnest Money Deposit of Rs. 2,00,000/- By Pay Order Or Demand Draft Will Not Be Considered. However, tenderers who have already deposited one time EMD of Rs. 2,00,000/- with BHEL PSNR are exempted from depositing EMD with this tender.
4. Bidder(s) can download complete tender document from the BHEL website. They can also purchase hard copy of tender documents from this office on payment of Rs.1000/- (non-refundable) either in cash or by crossed demand draft drawn in favour of BHEL, NOIDA.

DGM/ SCP

BHARAT HEAVY ELECTRICALS LIMITED
(A GOVERNMENT OF INDIA UNDERTAKING)
HRDI & PSNR COMPLEX, PLOT NO. 25 SECTOR-16A,
NOIDA, DISTT. -GAUTAM BUDH NAGAR –201 301

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 the 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.

PROJECT SYNOPSIS

(2 X 125 MW, Thermal Power Project, Barsingsar, Bikaner, Raj.)

M/s Neyveli Lignite Corporation Ltd., Neyveli, a Govt of India Enterprise with Head Office at Cuddalore Distt, Tamilnadu has entrusted BHEL for Erection, Testing And Commissioning of 2 x 125 MW Thermal Power Project at, Distt. Bikaner, Rajasthan. The Thermal Power Project is a lignite based Power House.

The site location is about 25 KM South west of Bikaner (8 KM west of Palana on NH – 89 Bikaner- Jodhpur- Ajmer road and 15 Km from Bikaner-Jaisalmer-Kandla NH - 15). Palana is the nearest Railway station on Merta Road – Bikaner Section of Northern Railways. The nearest Airport is at Jodhpur. All dispatches are expected by road, as there is no railway siding available. All bidders are advised to visit site and acquaint themselves with the condition prevailing at site before quoting for the work.

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 are 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 subject to a maximum of 50% of the total security deposit value. The balance 50% has to be remitted either by cash or in the other form of security. 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.

19.6 **`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.

19.7 **`GENERAL CONDITIONS OF CONTRACT'** shall mean the `Instructions to Tenderers' and `General Conditions of Contract' pertaining to the work detailed.

19.8 **`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 there of.

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 effect 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 pay-roll 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.

27 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.

27.7The 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 lumbers 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 shall 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 gets 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--

ANNEXURE-A

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.

ANNEXURE – B

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.	Catetory	No. of Person available on roll of the Orga-nasation	Month (Indicate No. of persons to be deployed in each month)						
			Ist	2nd	3rd	4th	5th	6th	and so on
1.									
2.									
3.									
	Total								

(SIGNATURE OF TENDERER)
WITH STAMP

ANNEXURE – D

(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	2nd	3rd	4th	5th	6th	7th	8th and so on

(SIGNATURE OF TENDERER)
WITH STAMP

ANNEXURE - E

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

ANNEXURE - F

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.

ANNEXURE - `G'

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 clause11.7 (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 not withstanding 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 documents 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,
   10th 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,
   11th 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.,
    5th 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.

ANNEXURE - I

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 Octoroi, 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)

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

3.1 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

RELEVENT 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 selections, 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 CUSTOMER REVIEW AUDIT REQUIREMENT
			PERFOR-MER	CHECK-ER	APPRO-VER	

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
HOUSING KEETING				
Waste containers provided and used				
Sanitary facilities adequate and clean				
Passageways and Walkways Clear				
General neatness of working areas				
Others				
PERSONNEL PROTECTIVE EQUIPMENT				
Goggles: Sheilds				
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)

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

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

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

MONTHLY HSE CHECKLIST CUM COMPLANCE 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 PRCTICETIONER, 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
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**

SPECIAL CONDITIONS OF CONTRACT (PART-A)

SECTION-III
(PART-A)

SPECIAL CONDITIONS OF CONTRACT

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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 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 equipment as specified and otherwise required for the work, consumables for erection, testing and commissioning including material handling.

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, rectification and modification in electrical circuits/ wiring involving removal of connections & redoing as per modification.

f) Preservation/ Re-conservation of all components during storage/ erection till handing over.

34.5 Health, Safety & Environment management (HSE)

34.5.1 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 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).

34.5.2 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 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.

34.5.3 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 qualified & trained Site Engineer at site during all working hours.
- 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.
- Deployment of Safety Supervisors for every 250 workers and part there of 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.
- 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 & 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 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.

34.5.4 Contractor shall ensure following:

1. Contractor has to maintain contact with local hospital having ambulance facility, scanning & other ultra modern medical facilities required during emergency.

2. Contractor has to ensure pre employment medical check for all staff & workers.

3. Contractor has to ensure that adequate First Aid facilities with trained nurse are available at work site for emergency purpose. This emergency set-up should include, but not limited to, following

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

   In addition to above, BHEL (through its other contractor) has arranged ambulance at work site for emergency purpose, which can be utilized by contractor in case of emergency. In case, under unavoidable circumstances, if the ambulance is not available, the contractor will have to arrange for the same as under clause 34.5.4 (1).

34.5.5 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 of Rs. 1000/- for the first violation and Rs. 3000/- for the subsequent violations. For serious lapses, as decided by BHEL Engineer/NLC, fines upto Rs. 50000/- at a time can be imposed.

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 on above will be final and binding on the Contractor.

In addition, Safety Code/ Practices of M/S NLCL (BHEL's customer) shall also be applicable.

34.5.6 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 Discrimation/ Corporal punishment for failure in meeting with relevant requirements.

(e) The Contractor shall abide the requirement of Contract Labour (Regulation & Abolition) Act, 1970 for working hours.

(f) The Contractor shall abide by the statutory requirement of Minimum Wages Act 1948, payment of Wages Act 1936.

(g) The Contractor shall arrange potable drinking water to its employees & workers.

34.5.7 In order to meet the environmental concerns it is expected that the contractor shall plant at least **100** (one hundred) trees and maintain them throughout the period of Contract in the vicinity of the project as per the available space and as per advise of Engineers.

35.0 CIVIL WORKS, FOUNDATIONS AND GROUTING.

35.1 BHEL shall provide all equipment foundations. The contractor for their correctness, as per drawings, 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.

35.2 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.

35.3 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 Ordinary Portland Cement or any other material specified in the drawings/ documents or by BHEL. The minimum thickness below the packer plate should be maintained as per instruction of BHEL. The material required for this has to be arranged for by the contractor at his cost.

35.4 Required Grouting of equipments is in the scope of the contractor. The Contractor has to ensure that all the matching joints, which are not to be grouted, shall be kept free from the grouting mixture by applying tape or any other alternative method approved by Engineer. The contractor has to arrange for all materials required for carrying out the grouting including supply of the Special Grout as indicated in the drawings and as approved by the Engineer. The contractor will be required to supply and apply actual quantity of Non- Shrink Grout/ other specified cement/ OPC as per the specifications and site requirement without any extra cost.

35.5 After the grouting, the foundations are to be cured by contractor to the satisfaction of Engineer. The contractor shall check and verify the alignment of equipment to ensure that no displacement had taken place during grouting.

35.6 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 any temporary works 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.

36.0 CONSUMABLES

36.1 The contractor shall provide within finally accepted rates, all consumables like, gland packing, all welding electrodes (including alloy steel, Aluminium, stainless steel), Aluminum filler wires, TIG wires, all inert/ welding gases, soldering material, dye penetrants, other erection consumables such as tapes, jointing compound, grease, mobile oil, M-seal, Araldite, Parmali wood, petrol, CTC/ other cleaning agents, petroleum jelly, insulation tape, PVC sealing compound, sleeves, cable ties, gaskets and shims, wooden, sleepers, steel required for temporary works such as supports, packing hardware items, sealing compound required for completion of work except those which are specifically supplied by manufacturing unit.

36.2 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.

36.3 It shall be the responsibility of the contractor to obtain prior approval of BHEL, regarding suppliers, type of electrodes etc. before procurement of welding electrodes/ TIG wires. On receipt of electrodes at site these shall be subjected to inspection and approval by BHEL. The contractor shall inform BHEL details regarding type of electrodes, batch No. date of expiry etc. and produce test certificate for each lot/ batch with correlation of batch/ lot no. with respective test certificate. No electrode will be allowed to be used without valid test certificate.

36.4 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 & records maintained.

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

36.6 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.

36.7 All lubricants and chemicals required for testing, pre-commissioning, commissioning, preservation and lubricants for trial runs of the equipment shall be supplied by BHEL/ BHEL's client. All services including labour and T&Ps will be provided by the contractor for handling, filling, emptying, refilling etc. The consumption of lubricants/ chemicals shall be properly accounted for. Surplus material if any shall be properly stacked and returned to stores.

36.8 Transportation of Oil Drums from stores, centrifuging and first filling of Oil, subsequent topping/ makeup till the unit is commissioned and handed over to the customer is included in the scope of this contract. The contractor shall have to return all the empty drums to BHEL/ BHEL client's store at no extra cost. Any damage/ loss of above drums shall be to the contractor's account.

36.9 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.

37.0 TOOLS AND PLANTS/ IMTE's

37.1 **T&Ps being provided by BHEL to sub-contractor free of hire charges as per Annexure-I** shall be shared by other sub contractors working for BHEL at site and the allotment done by BHEL Engineer shall be final and binding.

37.2 Besides the T&Ps and IMTEs being made available to contractor free of hire charges by BHEL, all other T&Ps and IMTEs which are required for successful and timely execution of the work covered within the scope of this tender, shall be arranged and provided by the contractor **(As per Annexure-II & III)** at his own cost 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 as applicable shall be deducted from contractor's bill. Decision of BHEL in this regard shall be final and binding on contractor.

37.3 All distribution boards, connecting cables/ welding cables, wire ropes, hoses etc. including temporary air/ water/ electrical connections etc. shall have to be arranged by the contractor at his own cost.

37.4 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.

37.5 The operation of all BHEL's T&Ps being provided free of hire charges shall be in the scope of the contractor. The contractor shall arrange at his own cost operators, fuel, and other consumables etc. for the operation. All lubricants, hydraulic oil and grease will be provided by BHEL free of cost for which the contractor will give the requirement well in advance.

37.6 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 absolves contractor of his responsibilities for proper and safe handling of equipment, consistent good performance and regular performance evaluation of operators.

37.7 The day to day and routine maintenance of BHEL's T&Ps should be carried out by contractor as per manufacturer's/ BHEL's maintenance schedule at his cost. These shall be maintained in good 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 which 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.

37.8 The contractor shall arrange at his cost all spares needed for upkeep of all T&Ps other than cranes supplied by BHEL. For cranes, repair/ replacement of filter, batteries, self, dynamo, gaskets, hoses, oil seals and rubber parts shall be the responsibility of the contractor. 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. However, 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 to the account of contractor and shall be recovered from his RA bills.

37.9 All supervision and labour required for maintenance and attending breakdowns shall be arranged by the contractor at his own cost. Specialist supervision shall be arranged by BHEL as assessed by BHEL Engineer.

37.10 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.

37.11 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.

37.12 In the event of contractor not using and maintaining BHEL T&Ps and IMTEs 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.

37.13 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.

37.14 It shall be responsibility of the contractor to take delivery of T&Ps and IMTEs 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 BHEL Engineer in project site in good working conditions after use.

37.15 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 work load). If return of T&P and IMTE is delayed by contractor, 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/ unserviced condition to BHEL till its satisfactory repair. T&Ps & IMTEs returned in damaged/ unserviced 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.

37.16 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 bills.

37.17 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.

37.18 Contractor shall ensure deployment of reliable and calibrated IMTEs (Inspection measuring and Test equipment). The IMTEs shall have test/ calibration 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.

37.19 Retesting/ re-calibration shall also be arranged at regular intervals during the period of use as advised by BHEL Engineer with in 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.

37.20 BHEL shall have lien on all T&Ps, 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. No material brought to the site shall be removed from the site by the Contractor and/or his Sub-contractors without the prior written approval of the Engineer.

37.21 **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&Ps, 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.

37.22 Regular utilisation report of the BHEL T&Ps and IMTEs as per requirement of BHEL shall be furnished by the contractor.

38.0 SUPERVISORY STAFF AND WORKMEN

38.1 The contractor shall deploy all the skilled workmen like mill wright fitters, welders, gas cutter, riggers, sarangs, masons, carpenters, electricians, instrument technician etc., in addition to other skilled, semi-skilled and unskilled workmen required for all the works of handling and transporting from site storage to erection site, erection, testing and commissioning as contemplated under these specification. 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 ask for removal of any employee workman of the contractor at any time, if they find him unsuitable and the contractor shall forthwith remove him.

38.2 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 and in general see 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.

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

38.4 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 conform to the dimensions and tolerances given in the drawings/ documents/ instructions given by BHEL Engineer from time to time.

38.5 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.

38.6 During the course of erection, if the progress is found unsatisfactory or if the target dates fixed from time to time for every mile stones are to be advanced or in the opinion of BHEL, if it is found that the skilled workmen like fitters, Electricians, 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 and recover from the contractor’s bills any charges incurred for engaging the additional workmen with overheads.

38.7 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.

If the contractor or his workmen or employees shall break, deface, injure or destroy any part of a building, road kerb, fence, enclosure, water pipes, cables, drains, electric or

telephone posts or wire, trees or any other property or to any part of erected components etc., the contractor shall make the same good at his own expense or in default, BHEL may cause the same to be made good by other workmen or by other means and deduct the expenses (of which BHEL's decision is final) from any money due to the contractor.

38.9 **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 man power, 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. Separate persons shall be identified at site for quality control and safety by the contractor.

39.0 MATERIAL HANDLING AND STORAGE

All the equipment and material furnished under this contract (except those which are mentioned specifically in the scope of work) shall be received from the project stores, sheds/storage yards (any place within site) and transported to be pre-assembly area/ erection site and stored in the storage spaces in a manner so that they are easily retrievable till they are erected by the contractor. While drawings/ lifting material from BHEL/ customer stores, contractor shall ensure that the balance/ other materials are stacked back immediately.

While BHEL will endeavour to store/ stack/ identify materials properly in their open/ close/ semi closed/ tarpaulins covered storage yard/ shed, it shall be contractors 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.

39.3 The contractor shall take delivery of components, equipment/ consumables from storage area after getting the approval of BHEL Engineer on standard indent forms.

39.4 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.

39.5 All the equipment shall be handled very carefully to prevent any damage or loss. No untested wire ropes/ slings etc. 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.

39.6 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. In no case piping should be dragged. In case of any damage, the cost shall be covered from the contractor.

39.7 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 to BHEL.

39.8 Contractor shall be responsible for examining all the plant and material 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 submit to the Engineer every week, a report detailing all the receipts during the week. However, 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 no. of watch/ ward personal to avoid any pilferage of material. In case any equipment/ material is lost/ damaged while in the custody of the contractor, the cost of repair/ replacement if any to bring back the equipment in original order shall be deducted from the contractor's bill. BHEL's decision in this regard shall be final and binding on the contractor.

39.9 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.

39.10 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.

39.11 All electrical panels, control gear, motors and such other devices shall be properly dried by heating before they are installed and energised. Exposed parts those required special protection such as bearings, slip rings, commutators shall be protected against moisture ingress and corrosion during storage and are periodically inspected. Heavy rotating parts in assembled conditions shall be periodically rotated to prevent corrosion due to prolonged storage.

39.12 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.

39.13 The contractor shall ensure that all the packing materials and protective devices used for various equipment during transit and storage are removed before the equipment are installed.

39.14 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

39.15 **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.** An account will be maintained by the contractor for all such items received and returned to BHEL and duly reconciled before closing of the contract.

39.16 The contractor shall hand over all parts / materials remaining extra over the normal requirement with proper identification tags to the concerned BHEL/ Customer or at a place in project area as directed by BHEL Engineer.

39.17 Power Transformer tanks shall be dispatched from BHEL/ Suppliers manufacturing units directly to site by road on trailers. It may be unloaded near foundations by other agency (with in a distance of 100 M). The contractor shall be required to place these on foundation by dragging, jacking, rigging or lifting by crane on the foundation.

39.18 While Transformer main tanks will be delivered near the foundation, the accessories and oil will be issued to the contractor from BHEL stores/ place of stacking for installation. All arrangements for receiving, transporting & handling of such accessories, transformer oil drums etc. are to be made by the contractor except those spelt out else where in the contract.

39.19 Till the start of erection of respective transformers, supplied oil/ Gas filled, it will be contractor's responsibility to maintain the gas pressure and replace/ reactivate silica gel. Silica gel will be arranged by contractor within the accepted rates. However the N2 gas,

if required, will be provided by BHEL free of cost & filling etc. will be arranged by the contractor with in the accepted rates for transformer erection & commissioning.

40.0 PRESERVATION OF COMPONENTS

40.1 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 stored in such a way that item is at least six inches (6") above the ground.

Motors, valves, electrical equipment, control equipment and instruments etc. shall be stored indoors in warehouse provided by 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.

40.2 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.

40.3 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.

40.4 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.

41.0 WELDING and NDT

41.1 The method of welding (ARC, Gas, TIG, MIG or any other method) may be indicated in the detailed drawings/ schedules and specifications. BHEL Engineer will have the option of changing the method of welding as per site requirements.

41.2 All welders including tack welder, structural and pipe welder shall be tested and approved by BHEL Engineer before they are actually engaged on work. BHEL reserves the right to reject any welder if the welder’s performance is not found to be satisfactory. All charges for testing of contractor's welders including destructive and non destructive tests conducted by BHEL at site or at laboratory shall have to be borne by the contractor only. The test coupons raw material will be supplied by BHEL free of cost

41.3 Engineer may stop any welder from the work if his performance is unsatisfactory for any technical reason or if there is a high percentage of rejection of joints welded by a particular welder which, in the opinion of the Engineer will adversely affect the quality of the welding though the welder has earlier passed the tests prescribed by Engineer. The welder’s has passed qualification tests does not absolve the contractor of contractual obligation to continuously check the welder's performance.

41.4 Faulty welds shall be cut and re-welded at the contractors expenses. The procedure for the repair of defective welds shall be approved by the Engineer prior to any repair being

made. Records of such repairs and defects shall be maintained by the contractor as per BHEL Engineer's advice

41.5 All charges for testing of contractor's welders including destructive and non-destructive tests conducted by BHEL at site or at laboratory shall have to be borne by the contractor only.

41.6 Only BHEL approved make electrodes will be used. All electrodes shall be baked and dried in the electric electrode baking 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. Electrodes from holding oven shall be transferred to portable ovens. The electrodes brought to the site will have valid manufacturing test certificate. The test certificate will have co-relation with the lot No./ batch No given on electrode packets. No electrodes will be allowed to be used in the absence of above requirement. The thermostat and thermometer of electrode drying oven will be 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. Periodical calibration for the same shall also be arranged by the contractor within the finally accepted rates.

41.7 The regulators used on welding machines shall be calibrated before putting these into use for work. Periodic calibration for the same shall also be arranged by the Contractor at his cost.

41.8 All welds shall be painted with anticorrosive red oxide paint. Necessary consumables and scaffolding etc. Including paints shall be provided by contractor at his own cost. Daily welding reports in the proforma suggested by BHEL should be submitted without fail.

41.9 Non-destructive testing is part of erection work and shall be carried out by the contractor in accordance with the quality plan and as per instruction of Engineer. Decision of Engineer shall be final and binding on the contractor.

42.0 PROGRESS REPORTING

42.1 Contractor is required to draw mutually agreed monthly erection programmes in consultation with BHEL well in advance. Contractor shall ensure achievement of agreed programme and shall also timely arrange additional resources considered necessary at no extra cost to BHEL

42.2 Weekly progress review meetings will be held at site during which actual progress during the week vis-a-vis scheduled programme shall be discussed for actions to be taken for achieving targets. The programme for subsequent week shall also be presented by contractor for discussions. The contractor shall constantly update/revise his work programme 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.

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

42.4 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 programme and the slippages do not accumulate and effect the overall programme.

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

43.0 DRAWING AND DOCUMENTS

43.1 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.

43.2 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.

43.3 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.

43.4 The data furnished in various annexures 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.

43.5 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.

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

44.0 INCOME TAX, SERVICE TAX AND SALES TAX ETC.

44.1 **TDS under Income Tax, Sales Tax, VAT etc,** if any, shall be deducted at prevailing rates on gross invoice value from the running bills unless Exemption Certificate from appropriate Authority/ Authorities is furnished.

44.2 **Price quoted shall be inclusive of all taxes except 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**.

44.3 In VAT applicable States, "Tax Invoice" if required under the relevant State VAT law shall be submitted alongwith other compliances as per concerned VAT Act.

44.4 Contractor shall get his organization registered with concerned Sales tax/VAT authorities within 15 days of award of this contract, if applicable. 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.

44.5 Contractor has to make his own arrangement at his cost for completing the formalities, if required, with Sales Tax/ VAT Authorities, for bringing their materials, plants, and equipment at site for the execution of the work under this contract.

45.0 EXTRA WORK:

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

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

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

45.3 The extra works, if any, shall be carried out by a separate gang or beyond working hours which can be identified for certification of manhours. Log book should be maintained and should be signed jointly by the contractor's representative and the BHEL Engineer on day-to-day basis. However, signing of the log book 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 manhours, which 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.

46.0 PRICE VARIATION

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

$$P1 = \frac{0.75 \times P0 \,(F1 - F0)}{F0}$$

P1 = Increase/ Decrease in billing amount (variation) for the particular month of billing.

P0 = Billing amount calculated as per contract provisions.

F1 = All India CPI published by Labour bureau, Simla, Govt. of India, for Industrial workers (Base 1982 =100) applicable for the month under consideration i.e. for which bill has been raised.

F0 = All India CPI published by Labour bureau, Simla, Govt. of India, for Industrial workers (Base 1982 =100) applicable for the month of original due date of opening of this tender.

46.2 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 from the date of award. 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.**

46.3 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.

47.0 RATE SCHEDULE

47.1 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/ price.

47.2 **The tenderer shall quote the rates/ Price 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.**

47.3 **Contractor's total quoted price as per rate schedule will be taken as tentative only. 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. The quantities indicated against each item may vary to any extent and no compensation will be payable in variation of Individual quantity. However, in case of over all variation in Contract value (as indicted in LOI), beyond (minus) 30%, the contractor will be eligible for compensation as per the following provision:**

"The total 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 are requested to take above into account while quoting. The contractor confirms that unit rates quoted above takes care of such variation during execution stage.

48.0 INSTRUCTIONS TO TENDERER

48.1 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)

48.2 No deviations to the tender conditions will normally be accepted.

48.3 The tenderers are advised to actually visit the site and fully acquaint themselves with site conditions, 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.

48.4 The contractor in the event of this work awarded to him, shall establish a site office at site and keep posted an authorised 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 authorised 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.

49.0 LIQUIDATED DAMAGES (LD)

49.1 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.

50.0 SECURITY DEPOSIT

50.1 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 on Page No. 34(a) of the 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.

51.0 OTHERS

1. In case of any contradiction between General Conditions of Contract (GCC) and Special Conditions of Contract (SCC), the latter shall prevail.
2. The tenderer shall specifically confirm he has inspected the site of work and is fully conversant with the prevailing conditions under which work is to be executed and will not raise claim of any nature due to lack of knowledge of site condition. He will also confirm that local taxation laws at the site have been clearly understood by him.
3. 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.

SPECIAL CONDITIONS OF CONTRACT (PART-B)

SPECIAL CONDITIONS OF CONTRACT
(PART-B)

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SPECIAL CONDITIONS OF CONTRACT
SECTION-III (PART-B)

52.0 SCOPE OF WORK

52.1 BHEL has been awarded the work of Design, Manufacture, supply, installation, erection, testing & commissioning of 2*125 MW, UNIT 1 & 2 at Barsingsar Thermal Power Project of Neyveli Lignite Corporation LTD. at Barsingsar, Bikaner, Rajasthan on turnkey basis. Scope of these specifications cover complete work of handling, transportation of materials from Project storage yard/ stores to erection site/ place of erection, storage at erection site, preservation, watch and ward, dressing, chipping and leveling of foundations, cleaning, checking, testing, pre-assembly, erection, calibration, alignment, grouting, welding, NDT wherever required, preservative/ touch-up painting including supply of paints etc, earthing of equipment, including other activities required for erection, testing, commissioning, post commissioning, trial operations & handing over of ELECTRICAL, CONTROL & INSTRUMENTATION equipments and items indicated in the rate schedule covered within the scope of these specifications for 2*125 MW, UNIT 1 & 2 at Barsingsar Thermal Power Project of Neyveli Lignite Corporation Ltd. at Barsingsar, Bikaner, Rajasthan.

52.2 The quantities mentioned in the rate schedule are tentative and may very as per the actual engineering/ requirement to complete the package for electrical and C & I work. Some of the items may be added or deleted which shall have to be executed by the contractor within his scope of work and shall be paid as per the rates awarded in the contract. The contractor shall have to erect, test and commission entire material listed in the rate schedule. The decision of BHEL in this regard shall be final and binding on the contractor.

The rates for the additional items may be considered on the rates of similar category of items in the rate schedule as approved by BHEL.

The scope of work shall also include the following within the quoted item rates:

i) Re-rolling of cables on drums as required by site engineer.
ii) Obtaining provisional and final approvals from Electricity Authorities.

52.3 The scope of work also covers all performance tests necessary to ensure that workmanship confirms to relevant standards and that such tests are adequate to demonstrate that the installations complies with the requirements of this specification. All arrangements for conducting tests are to be made by contractor within their quoted rates and tests may have to be repeated to satisfy BHEL/ NLC Ltd.

52.4 **Contractor to ensure services of FOUR qualified and experienced Diploma/ degree Electrical Engineer having experience in respective field and qualified and FIVE experienced Diploma/ degree Instrumentation Engineer having experience in respective field, entirely for the commissioning activities from second month of mobilisation till contract completion. This shall be indicated separately in manpower deployment plan to be submitted by contractor. These Engineers shall be reporting directly to the BHEL Engineer for the main work.**

All Supervisors/ Engineers shall have to be supported individually by all independent groups comprising of workers like electrician, technicians and helpers etc. and required T & P and IMTE's.

52.5 **The contractor under this contract shall also provide free of cost services of skilled persons for a total period of 82 Man-months exclusively for use by BHEL. This manpower will be required for following services**

- Qualified computer operators (minimum 'O' level qualified) capable of operating the material management software package/ other packages available at site or for office work for total 12 man months,
- Skilled workers for working in store, colony and in maintenance of office for a total 40 man months and
- Unskilled workers for working in store, colony & office for a total 30 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 Barsingsar for the categories given plus 10% will be made from the final bill of the contractor.

52.6 The scope of work will also include providing free of cost services of experienced and qualified Engineers by contractor for direct supervision of various works of power plant preferably works other than the scope covered under this tender. The qualification and experience of the engineers shall be acceptable to the Construction Manager BHEL BARSINGSAR site. These qualified Engineers shall be provided for Thirty Six (36) manmonths as per site conditions. The Engineers shall possess a minimum qualification of a mechanical/ electrical engineering degree and working experience in power plants. 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.

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 a lump sum of Rs 10,000/- (Rupees Ten Thousand Only) per man month for the un-utilised man months will be recovered from the bills of the contractor.

52.5 *The brief description of major equipment/ items to be erected tested and commissioning under the scope of subject work is as described below*. However change in design/ specification may occur as is usual in any such large work for which no compensation will be payable. Contractor shall complete the entire work as detailed in tender specification including dry out/ centrifuging of transformers within

the contractual rates. In case during testing, commissioning, post commissioning, trial operation the IR valves of electrical equipment is found low, the contractor shall make arrangements and dry out the equipment within the quoted rates. Removing & reconnection of equipment will be the part of scope at no extra cost to BHEL.

Erection, Testing & Commissioning, handing over of following Electrical, Control & Instrumentation scope of work as per schematics, drawings, manuals and as detailed below in brief:-

(I) ELECTRICAL SCOPE

A) Isolated Phase Busduct :

IP busduct details per unit (2* 125 MW, Unit 1 & 2) are as: 3nos. 10.5 V, 10000A, Al Conductor, Al Alloy Enclosure Bus ducts. The Bus duct connects Gen Transformer to the Generator and has Tap Off for 2 nos UAT, LAVT and NG Cubicle. In the Neutral Side, the Star Formation is made to form the star point and the Generator is earthed thru the NG Transformer. The approximate total route length of the Main Run & UAT / LAVT Tap Off is 160 m & 54 m per unit (estimated) respectively. The conductor section in the Main Run is Circular shape 465 mm dia duct, 15 mm thick and that of Tap Off is 215.5 mm OD, 8.1 mm thk. The duct diameters for Main and Tap Off is 1000mm, 8mm thk and 780 mm, 4.78 mm thk. The appx weights of the supporting structure are 16 MT (estimated).

In addition, there is 1 set of 3 nos LAVT per set having dimensions 3300 mm x 2250 mm x 2650mm (estimated) and having weight of 3 MT each approx. 1 no. NG Cubicle consisting of 1 no. NGT and 1 no. NGR and having a total weight of 1.8 MT is envisaged.

Hot air blowing Unit having a total weight of 1.0 MT is envisaged. Seal Off Bushing and Rubber bellows are also provided in the bus duct.

B) 6.6 kV SWITCHGEAR :

6.6 kV Switchgear System consists of Spring Operated Metal Clad Vacuum Interrupters with Protection and Metering CTs, PTs, Relays and Meters. The weight of each panel including trolley is approx. 1.5 MT. Panels will be transported in section of 2-3 panels.

In addition, 2 no. each FEB and BEB per SWBD will be supplied.

Approx. qty of panels per switchboards are:-

- 6.6 KV Unit switchboards, 2000A - 1CA, 1CB, 2CA, 2CB (approx.14Panels each)
- 6.6 KV Station switch boards, 2000A - 0CA. 0CB (approx. 16 panels each)
- 6.6 KV Lime Stone Milling Switchboards, 1250A - 0CC (approx. 12 Panels)

C) LT SWITCHBOARDs

LT swbd consists of Air CKT Breakers, SFUs, relays, meters, contactors, CTs, PTs etc. with protection and metering scheme.

LT Switchboards for 2*125 MW are as:

- 415 V, Unit Swbd, 2500A - 1DA, 2DA
- 415 V, Boiler MCC, 630A - 1HA, 2HA
- 415 V, Boiler Valve MCC, 250A - 1HB, 2HB
- 415 V, Turbine MCC, 630A -1KA. 2KA
- 415 V, Turbine Valve MCC, 250A -1KB. 2KB
- 415 V, Unit Service ACDB, 400A - 1QA, 2QA

- 415 V, Emergency PMCC, 1000A - 1DG, 2DG
- 415 V, Emergency DG SWBD, 1000A - 0DG
- 415 V, ESP SWBD, 2500A - 1DB, 2DB
- 415 V, Lighting SWBD, 1600A - 0DF
- 415 V, STN Service SWBD, 2500A - 0DA
- 415 V, Fuel Oil House MCC, 400A - 0QA
- 415 V, A/C & Ventilation SWBD, 1600A - 0DB
- 415 V, Ventilation MCC, 100A - 1TA, 2TA
- 415 V, Lime Stone Milling SWBD, 2500A - 0DC
- 415 V, Lime Stone Conveyers MCC, 2500A – 0QB
- 433 V, Emergency Lighting DB – 1, 2
- 433 V, Main Lighting DB – 1, 2
- 220 V, Unit DCDB – 1FA, 2FA
- 220 V, Station DCDB – 0FA

D) 6.6 kV SEGREGATED PHASE BUSDUCT:

Busduct rated 4000A, 2000A
Segregated phase busduct are from Station Transformer (2 nos.) and UATs (4nos.) to respective Switchboards, switchboards interconnected as per scheme. Bolted type Aluminum Alloy SPBs provided with space heaters and thermostats and duly wired upto terminals in the marshalling box, envisaged are described below. In addition, Seal Off Bushing and Rubber Bellows are also envisaged. The installation includes wiring/ cabling of space heaters is to be done at site

The ST/ UAT SPBs also includes the tap-off to the NGT to NGR. Total Length of segregated phase duct is approx. 450 meter or more.

E) LT SEGREGATED PHASE BUSDUCT (NSPB):

Non Segregated Phase Busduct rated - 16sets
415 V, Al conductor, Al Alloy Enclosure Busduct connecting Service Transformers and the LT Switchgear. The bus duct is supplied in sections and is to be installed at site with loose supplied components Viz. structure, bus duct section, JBs, seal off bushings, split covers, earthing strip, Jointing of various sections supplied shall be done by bolting as specified. The installation includes wiring/ cabling of space heaters is to be done at site.

F) LT SERVICE TRANSFORMERS (DRY / OIL TYPE):

The checking of foundation, levelling alignment etc. will be done by erection contractor. Issue of transformer & accessories/ auxiliaries from stores & Transportation to site, Erection of accessories and auxiliaries after foundation checking and carrying out minor modification wherever required, Testing and Commissioning of transformer.

- LT SERVICE TRANSFORMERS (DRY TYPE) 6.6/ 0.433kv, Dyn11, 1600KVA – 14 nos
- LT SERVICE TRANSFORMERS (DRY TYPE) 6.6/ 0.433kv, Dyn11, 1000KVA – 2 nos
- LTG TRF Dyn1, 415/433V – 4 nos
- VFD TRF for ID FAN – 4 nos
- VFD TRF for SA COMP. 6.6/0.433 KV, 750 KVA – 2 nos

G) DC System

The DC system consists of 3 sets of 220V battery chargers and 220 V lead acid batteries.

- **BATTERY CHARGERS**
  - Erection of Panels after foundations checking/ fabrication of base frames or stools (wherever applicable) and carrying out minor modification wherever required; Joining of panels, inter-panel wiring, busbar & earthbar connections, mounting of loose supplied items,
  - Erection of Isolater Fuse Boxes; Testing of complete board & including testing/ calibration of all instruments and schemes; Dummy load test of Chargers including arranging of dummy load and temporary power supply etc.
  - 220V Float Charger for Station, Unit 1 & 2 (3 nos)
  - 220V Float Cum Boost Charger for Station, Unit 1 & 2 (3 nos)

- **DC BATTERY**

Dimension and number of cells of each battery bank shall be as per drawing, documents and specifications. Erection of battery after assembly of battery stands, inter-connection of batteries and first charging; Capacity testing using dummy load and subsequent recharging (in case of failure of capacity test, the charging Discharging cycle is to be repeated) Dummy load test of chargers includes arrangement of dummy load and temporary connection in absence of regular power supply. 220 V DC Battery Bank (Lead Acid **Plante** Type) for Station and Unit 1 & 2 shall consist of 3 sets.

- **UPS system**

a) Battery charger panels
b) Bypass switch
c) UPS distribution board
d) Battery sets

H) Neutral Earthing Equipment

6 nos Neutral grounding resistance are to be supplied for the UAT and Station Transformers. The NGR are structure mounted with structure having approx. dimension 950mm*650mm*2000mm and weight of approx. 100kg. The size of the NGR is 950*760*1325 and weighs approx. 400kg. The NGR will be supplied in knocked down condition and is to be assembled at site.

- NGR for UAT – 4 nos
- NGR for Station Transformer – 2 nos

I) Control & Protection Relay Panels – GRP, BTS Panels, AVR (SEE) Panels

J) Cabinets and Misc. Electrical Equipment (JBs, Welding Sockets, Local PBs etc.)

K) Variable Speed AC Drives Panels

L) Station Cabling:-

The Cabling system consists of Cable Tray installation, Cable laying and Cable termination. The brief description of the systems is as under:-

Various types of Cable Trays

Cable Laying

The total length of Cables envisaged for the Plant is as under:
6.6 KV Cable
LT Power Cables
LT Control Cables
Signal Cables
Screened Cables

M) DG set Panels (2 sets)

The Electrical system of the 3 phase, 415V, 500 KVA, Emergency DG Set consists of the following equipments:

- DG AMF Control Panel
- DG MCC Panel
- 24V Battery & its Charger
- Associated Cable trays and interface cables (LT & control)

(II) INSTRUMENTATION SCOPE

AA) PANELS – Max Control / Distribution / Starter Panels Etc

BB) Control, Monitoring & information system based on BHEL make maxDNA system for:

a) Steam Generator Controls (for CFBC Boiler) comprising of:
Electronic System Cabinets catering to:
*Open Loop Control System (OLCS) of Burner management & Soot blowers
(Start up burners 1 & 2 and Bed lances)

b) Steam Turbine Controls comprising of
Electronic System Cabinets catering to

- Electro-Hydraulic Turbine Controls (EHTC)
- Automatic Turbine Run-up System (ATRS)
- Gland Steam Pressure Controls (GSPC)
- Turbine Stress Evaluator (TSE)
- Automatic Turbine Tester (ATT)
- Turbine Protection (TP)
- HP/ LP bypass (HP/ LPBP)

CC) Back up consoles (TRIP- only) supplied loose (to be mounted in owner's Control Desk).

DD) Man Machine Interface & Data Acquisition System comprising of:

- Operator Workstations (max Station)
- Engineering station (common for SG/ TG)
- Computers/ PLC based Equipments
- Laser printers (B/W-A3)
- Ethernet Switches

EE) Instrumentation Cables as per schematics

SG (CFBC):

- SBC: sensor to JB PVC/ FRLS/ STZ
- BMS: Console to Cabinet & Compensating Cables/PVC/FCLS/ST II

TG Controls

- Sensors to JB armored PVC/ FRLS/ STZ
- JB to Cabinet armored PVC/ FRLS/ STZ
- Consoles to Cabinet PVC/ FRLS/ STZ
- Compensating Cables PVC/ FRLS/ STZ

Station C N I controls

FF) Erection of miscellaneous Material for TG/ SG/ Stn C&I Controls

- Junction boxes
- CJBs
- Cable Trays (short length)
- Clamps
- Mounting Frames
- Power cylinders
- Rigid Pipe/ Conduits
- Pneumatic Tubes (Copper/ SS Tubing)
- Impulse line (CS/SS)

GG) Instruments (transmitters/ gauges/ switches/ temperature sensing elements like RTDs & thermocouples

HH) Detectors/ vibration, speed & other turbovisory pick ups

II) Sample handling system/ analyzer system

JJ) Control valves calibration

KK) Electronic water level indicator system

LL) Installation & testing of laboratory equipments

52.6 **Contractor shall erect, test, commission all the equipment, cabinets, panels, instruments etc. as per sequence prescribed by BHEL Engineer at site.** The sequence of erection/ commissioning methodology will be decided by the BHEL Engineer depending upon the availability of materials/ work fronts etc. No claim for extra payment from the contractor will be entertained on the grounds of deviation from the methods of erection/ commissioning adopted in erection/ commissioning of similar jobs elsewhere or for any reasons whatsoever.

52.7 The customer NLC may depute their representative for checking and supervision of important stages of work. The contractor shall be required to provide all facilities for inspection of works, without any cost implications to the Engineer. Any defect in quality of work or deviations from drawings/ specifications pointed out during such inspection shall be made good by the contractor in the same way if pointed out by the Engineer, without any cost implication to BHEL.

52.8 Contractor shall plan and transport equipment/ components from storage yard sheds to erection site and erect them in such a manner and in a sequence that material accumulation at site should not lead to congestion. Contractor shall plan activities considering plying of his vehicles on ring road also. Materials shall be stacked neatly, preserved and stored in the contractor's shed and work areas in an orderly manner. If required, the contractor shall arrange shifting of surplus material expeditiously failing which the same will be arranged by BHEL at contractor's risk and cost.

53.0 ERECTION

53.1 All works such as cleaning, checking, levelling, aligning, assembling, temporary erection for alignment, dismantling of certain equipment for checking, cleaning, surface preparation, fabrication at site, cutting, grinding, straightening, blue matching, chamfering, filing, chipping, drilling, machining, surface grinding, shaping, fitting up etc. as may be applicable in such erection works are to be treated as incidental to erection and necessary to complete the work satisfactorily and shall be carried out by the contractor as part of the work.

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

The following provisions cover the technical requirements for some of equipment installation. The brief idea about the work involved is indicated below however the work is to be carried out in accordance with the recommendations of the equipment manufacturer drawings, documents furnished to the contractor by BHEL or as directed by BHEL Engineer.

53.4 Any cutting of masonry work, which is necessary shall be done by the contractor at his own cost and shall be made good to match the original work. The Contractor shall obtain prior approval before cutting any masonry/ concrete work.

53.5 Conduits shall be thoroughly cleaned before pulling in the cable.

53.6 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 with sufficient bends. Bends upto 80 mm Nb will have to be fabricated at site.

53.7 In case of Transformers if any leakage/ sweating is observed from field assembled/ shop assembled gasket joints, valves, welded joints the same shall be attended by the contractor including draining of oil, refilling of oil & centrifuging if required at no extra cost to BHEL till handing over period. Sealing compound and any other consumable, if needed, shall be arranged by the contractor with in the quoted rates.

53.8 Calibration log-sheets/ history cards of all the instruments, panels, drives, relay testing etc. under the scope shall be recorded and submitted on BHEL approved formats. Proper logging will form a part of calibration/ erection activity for the purpose of monthly running bills payments.

53.9 The contractor shall use only SHEARING machine or HACKSAW for cutting angles, flats, channels and trays. No gas cutting is permitted. Drill machine shall be used for drilling holes.

53.10 The contractor should note that after execution of work they will hand over marked up drawings "as erected" drawings to BHEL Engineer at site for preparation of firm "as built" drawings. "As erected" drawings will bear the signature of BHEL Engineer and contractor.

53.11 The contractor shall paint the name/ put tag numbers on all the equipment/ instruments/ cables etc. erected by him. Materials for tagging shall be supplied by the contractor. Contractor at his cost shall also arrange the adhesive etc.

53.12 Contractor shall fabricate and erect stands/ supports for Junction boxes, push button stations, fixing of push button and plugging of holes in JB's. This is considered inclusive in the item erection.

53.13 DRIP SHIELDS shall be fabricated for all field mounted panels/ instruments/ instrument racks/ JB Racks/ control cabinets etc. The hardware/ material shall be supplied by BHEL. The fabrication forms part of erection work.

53.14 The motors and motorized valves actuators and solenoid valves will be erected by other agency. Their electrical commissioning, wherever required, is to be carried out by the agency within the subject scope of work at the finally accepted rates of applicable item as per Rate schedule. The staff earmarked for commissioning will carry out the work in association and guidance of BHEL Engineer as a part of system commissioning for which no extra cost will be paid by BHEL.

53.15 **ELECTRICAL SCOPE**

(A) ISOLATED PHASE BUSDUCT

Foundation checking and carrying out minor modifications wherever required, erection of Structure, Busduct, LAVT, NG Cubicle etc, alignment of total busduct and readiness for welding, Welding of Bus, Ducts and shunts, by MIG/ TIG and NDT and X-ray tests. Fixing of Rubber Bellows, Sobs, Wall Frame assembly, Flexible and Rigid Bus Connections, CTs, VTs, NGT and NGR. Erection of earth Conductors, Air Pressurization equipment and carrying out Water and Air Tightness Tests**.** Cabling of CTs upto Marshalling Box after MB erection, testing of CTs and wiring and other tests, Hipot of Main Busduct.

(B) LT SWITCHBOARDs

Various switchboards as detailed anywhere in the specifications are covered in the scope of contractor.

(C) SEGREGATED PHASE BUSDUCT:

Foundation checking and carrying out minor modification wherever required, erection of structures, Bus duct sections, and other loose items as per relevant drawings/ documents, alignments and jointing by bolting of total Bus duct, fixing of Rubber Bellows, seal Off Bushings, wall frame assembly, Flexible & rigid Bus connections, erection of earth conductors, cabling upto JB/ Marshalling Box, contact resistance checks on bus duct, Hi-pot of Bus duct, earthing of system with main earth conductor/ riser.

D) 6.6 KV SWITCH GEAR

Erection of Panels after foundation checking and carrying out minor modification wherever required, Jointing of panels, inter panel wiring, busbar & earthbar connections, mounting of loose supplied items, testing of complete panels, BEB, FEB and spare trucks, HV test of main and Control bus, testing & commissioning of breakers after scheme checking including testing/ calibration of all instruments and relays.

(E) LT SERVICE TRANSFORMERS (DRY TYPE/ OIL COOLED TYPE):

The checking of foundation, levelling alignment etc. will be done by erection contractor. Receipt & transportation of transformers & accessories/ auxiliaries from stores to site, erection after foundation checking and carrying out minor modification wherever required, Testing and Commissioning of transformers.

(G) DC system

DC battery chargers and UPS-

Erection of charger and UPS Panels, fabrication of base frames or stools (wherever applicable) and carrying out minor modification wherever required; Joining of panels, inter-panel wiring, busbar & earthbar connections, mounting of loose supplied items, Erection of Isolator Fuse Boxes; Testing of complete board & including testing/ calibration of all instruments and schemes; Dummy load test of Chargers including arranging of dummy load and temporary power supply etc.

DC Battery—

Erection of batteries after assembly of battery stands, inter-connection of batteries and first charging; Capacity testing using dummy load and subsequent recharging (in case of failure of capacity test, the charging Discharging cycle is to be repeated) Dummy load test of chargers includes arrangement of dummy load and temporary connection in absence of regular power supply.

(I) PANELS – POWER, CONTROL & RELAY (LTMCCs, GRPs, BTS Panels etc.)

Erection at site/ control room including chipping of floor, fabrication and fixing of base channel frame, levelling & alignment, welding the base channel to the embedded plates/ channels, grouting, fixing of anti-vibration pads, termination of inter panel connections, mounting/ connections of loose instruments, inter panel bus bar connections, commissioning including loop checking, system checking, and putting necessary controls on automatics. Checking of internal wiring, rectification, testing and calibration of equipment mounted inside is in the scope of contractor. The contractor may have to change/ replace items found faulty without any extra cost, however, materials for this shall be provided by BHEL. Mostly panels will be delivered fully wired. However, wherever required termination of loose wires, bus wires is to be done shall be in the scope of contractor. Canopy for panels will be supplied loose & shall be installed by the contractor after erection of panels. The cleaning of panels has to be done with electrical vacuum cleaner, besides conventional cleaning with brush etc. The drilling of holes in the gland plates for cable entry shall be part of panel erection. All blank holes/ gaps in the gland plates/ boxes etc. shall be properly sealed. The base frames shall be painted suitably. The contractor shall carry out the plugging and sealing of left out holes in the gland plates and other openings at the bottom of panels at his own cost by using fire retardant mortar or good quality sealing material as advised by BHEL**. Any minor alterations required in the bus bar arrangement, wiring in the panels/ cubicles shall also form part of the work. During testing, commissioning of some equipment/ modules may require replacement/ repairs. All such replacements/ repairs and assistance during commissioning and running of the unit till handing over to the Customer are part of the scope within the awarded price of contract.**

(J) CABLING

Ladder, prefabricated, slotted or duct type cable trays shall be supplied. **Cable tray erection work as per BOQ Cum Rate Schedule shall include fabrication of supports to suit site requirement, fixing of support in position by welding as per requirements/ engineers instruction. Fixing of cable trays and racks shall**

be by welding or with the fasteners. No separate payment will be released for fabrication/ fixing/ painting of support structure for cable trays *(Including supply of paint)*.

Jointing of trays can be carried out by bolting/ welding as per direction of Engineer. Contractor shall carryout cutting of tray only by Hacksaw for obtaining proper routing from standard lengths supplied. Materials for support fabrication like flats, channels, angles etc. shall be supplied by BHEL free of cost. The cutting & welding points on trays will be painted by primer & Aluminium paint by the contractor including supply of paint within the erection price and no extra cost to BHEL. These cable trays may also be required for laying copper tubing, plica type/ GI flexible conduits, local cabling and metal temperature Thermocouples.

In many cases, trays are supplied with tray covers. These covers have to be erected after completion of bottom cable tray and lying of cables etc. The covers are to be properly secured on the bottom trays and no separate payment will be made for putting these covers. If required, GI/ Al strip clamps are to be used.

(K) CABLE LAYING

Laying, dressing & clamping (by Nylon/ PVC ties or Aluminium strips or any other method and required ferrules as specified by BHEL Engineer) of the cables in the cable trays/ angles. The final dressing of cables on cable trays not erected by contractor shall also be done with Nylon Cord/ Aluminium strip. **Cost of cable laying as per BOQ Cum Rate Schedule shall include the consumables such as required ferrules, Nylon/ PVC ties & Aluminium strip required for dressing/ clamping. The cost of required Nylon/ PVC ties & Aluminium strip shall be in the scope of contractor within the awarded contract value.**

The cable run number shall be provided by punching Aluminium Tag plates and tying suitably with nylon ties (at both ends and at regular intervals as advised by BHEL Engineer) which shall be arranged by contractor at his cost. **Nylon/ PVC ties & Aluminium strip required to be provided for cable tags within a span of 5 mtrs/ as per documents and specifications shall have to be provided by the Contractor.**

While laying cables, existing cable tray covers and false flooring may require to be removed and re-fixed. The same has to be done at no extra cost to BHEL

(L) CABLE TERMINATION

Termination Of HT Cables Only Shall Be Measured And Paid Separately As Per Quoted / Accepted Rate Of Respective Item Of BOQ CUM Rate Schedule.

For Cables Other Than HT Cables, The Cost Of Cable Laying As Per BOQ Cum Rate Schedule Shall Also Include The Cost Of Termination With Suitable Crimping Type Lugs Including Supply Of Ferrules (for cross/ direct ferruling as per BHEL instructions). Only Cable Lugs & Glands Shall Be Issued By BHEL As Free Issue Item. Drilling of holes in gland plates of HT/ LT switchgear, transformer, control panels, JBs etc as per requirement shall also be part of cabling at no extra cost to BHEL.

The contractor shall carryout insulation testing, simulation testing etc. as per the instructions of Engineer at site.

Screen of signal cables shall run in insulated sleeve (to be arranged by contractor at no extra cost) and shall be terminated as per the instructions of the BHEL Engineer.

(M) JUNCTION BOX, PUSH BUTTONS ETC

Includes fabrication/ fixing/ painting of stands for junction boxes/ push buttons/ frame mounted panels etc will be included in quoted/ accepted price of respective item. **Tenderer may note that fabrication/ fixing/ painting of stands for junction boxes/ local push buttons/ indication boxes etc. will be included in quoted/ accepted price of respective item. No separate payment will be released for fabrication/ erection of these stands.**

(N) RIGID PIPE/CONDUITS

Cutting/ threading of standard lengths of conduits, laying on fabricated supports or on floor, using screwed fittings, clamping, sealing of open ends. Approved Good quality sealant shall be used to make the joint waterproof.

(0) PLICA FLEXIBLE CONDUIT

Laying of conduits in cable trays, end connection with instrument/ J.B./ panel, using suitable connectors/ unions etc. (this shall be supplied by BHEL). Suitable thread/ Plica sealant shall be used to make the conduit system waterproof. Aluminum painting, clamping and tagging in tray/ angle forms part of erection job

(P) EARTHING

Earthing work mainly involves laying and tack welding of conductors on columns/ beams at every one meter interval and bolted connections with equipment at least at two points. Low hydrogen content electrodes shall be used for welding. All the galvanized items shall be given surface treatment (by thoroughly cleaning with sand paper and/ or cotton cloth to make the surface clean, smooth & free from any type of spots) at the welded joints & the places where galvanizing has been damaged. Welded joints shall be applied with two coats of cold zinc paint whereas portions with damaged galvanizing shall be applied with single coat.

Earthing work shall also include the erection/ laying of earthing below ground (if required) and above ground as per drawing, documents and specifications i.e. risers, pipes, earthing flats, mats etc. However, the earthing below the ground shall be done by other agency of BHEL. The decision of BHEL engineer in this regard shall be final and binding.

53.16 INSTRUMENTATION

(AA) PANELS – Max Control/ Distribution/ Starter Panels Etc.

Erection at site/ control room including chipping of floor, fabrication and fixing of base channel frame, levelling & alignment with spirit level, welding the base channel to the embedded plates/ channels, grouting, fixing of anti-vibration pads, termination of inter panel connections, mounting/ connections of loose instruments, inter panel bus bar connections, commissioning including loop checking, system checking, and putting necessary controls on automatics. ***Tenderer may note that fabrication/ fixing/ painting of base channel (including supply of paints)/ suitable steel stool, if required, is included under the scope of this work. Contractor will be paid for fabrication/ erection as per applicable rates for structural steel fabrication/ erection.*** Checking of internal wiring, rectification, testing and calibration of equipment mounted inside is in the scope of contractor. The contractor

may have to change/ replace items found faulty without any extra cost, however materials for this shall be provided by BHEL. Mostly panels will be delivered fully wired. However wherever required termination of loose wires, bus wires is to be done. Canopy for panels will be supplied loose & shall be installed by the contractor after erection of panels. The cleaning of panels has to be done with electrical vacuum cleaner, besides conventional cleaning with brush etc. The drilling of holes in the gland plates for cable entry shall be part of panel erection. All blank holes/ gaps in the gland plates/ boxes etc. shall be properly sealed. The base frames shall be painted suitably. The contractor shall carry out the plugging and sealing of left out holes in the gland plates and other openings at the bottom of panels at his own cost by using fire retardant mortar or good quality sealing material as advised by BHEL**. Any minor alterations required in the bus bar arrangement, wiring in the panels/ cubicles shall also form part of the work. During testing, commissioning, some equipment/ modules may need replacement/ repairs. All such replacements/ repairs and assistance during commissioning and running of the unit till handing over to the Customer are part of the scope as some of the test/ commissioning will have to be done after the machine is running on various loads.**

(AB) INSTRUMENTS (TRANSMITTERS/ GAUGES/ SWITCHES/ TEMPERATURE SENSING ELEMENTS LIKE RTDs & THERMOCOUPLES)

- For instruments supplied loose, the scope includes issue from stores, calibration, erection (including fabrication and fixing of frames/ stands by welding to steel structure or by chipping & grouting with RCC columns/ floor) and charging/ loop checking. The work includes installation of housing connecting manifold/ PG valve on supports/ racks to be suitably fabricated for the instruments being supplied loose.

- For instruments supplied duly mounted on skids/ racks, the scope includes dismantling from skids/ racks, reinstallation after testing/ calibration, restoring electrical connections, if any, pressure testing of connected piping and charging/ loop checking. Servicing of manifolds PG valves shall also form part of erection job within the quoted prices.

- Some instruments may need repeated calibration/ replacement. The same will be carried out by the contractor at no extra cost to BHEL including calibration of instruments needed for replacement, which will be supplied by BHEL. Erection of thermo elements like RTDs & Thermocouples includes erection of thermowells, wherever required, at no extra cost to BHEL. The contractor, as directed by BHEL Engineer, will provide tags on all the instruments at no extra cost to BHEL. Tenderer may note that fabrication/ fixing/ painting of stands (including supply of paints) including fabrication/ erection of Instrument canopy (wherever required) for instruments will be included in quoted/ accepted price of respective instrument. No separate payment will be released for erection of gauge board, as this will be included in item rates of instruments mounted on the gauge board. Contractor will be paid extra for fabrication/ erection of stand only for the weight in excess of 25 kg per instrument and this extra weight will be paid as per applicable rates for structural steel fabrication/ erection.

(AC) DETECTORS/ VIBRATION, SPEED & OTHER TURBOVISORY PICK UPS:

Blue matching with the assembly fixtures/ main equipment surface, trial fixing, fixing by drilling/ tapping, final doweling. Moreover some detectors may have piggy-backs

signal detectors mounted on them as such these forms part of detectors assembly. The integral cables of the above shall be routed & dressed properly up to their JB/ Proximeter. ***Erection of proximitors, proximitor housings/ JB required for respective pick up and calibration/ commissioning of pick ups will be included in quoted/ accepted item rate of respective pickup.***

(AD) PNEUMATIC TUBES (COPPER/ SS TUBING):

Fabrication and erection of single angle supports/ tray supports for single multi run tube. Laying tubes in the angles/ trays from the panel to the equipment, instrument to instrument, air supply line to drive/ instrument, air line connections, clamping properly as per standard ferruling and termination at both ends. This includes all fittings and needle valves, stop valves etc. also. Proper tagging of valves and pneumatic tubes on both ends shall be done for proper identification. No extra charges will be claimed by contractor for any modification carried out after laying of pneumatic tubes/ draft pipelines due to site requirement in general.

(AE) IMPULSE LINE (AS/ CS/ SS)

Fabrication and erection of channel/ angle/ slotted angle supports, cleaning impulse pipe with wire brush and compressed air, edge preparation, cold bending, laying to the required slopes, clamping, welding of isolation/ drain valves and fittings by butt/ socket welding/ swoze lock joints. Servicing of valves, connecting with the process end and to the instruments, NDT, Hydraulic testing the impulse lines, and painting the lines as per requirement of BHEL engineer. The impulse line may have to be cleaned chemically for removing grease/ rusting. Proper tagging of valves and impulse lines on both ends shall be done for proper identification. No extra charges will be claimed by contractor for any modification carried out after laying of Impulse/ draft pipelines due to site requirement in general

(AF) COMPUTERS/ PLC BASED EQUIPMENTS

All computer related items/ equipment like CRT, monitors, printers, key boards, pre-fabricated connecting leads etc shall be installed in control room and control desk as per direction of BHEL Engineer. **Cost of PC set (including printer, monitor, UPS, interconnecting leads etc) installation as per BOQ Cum Rate Schedule shall also include the cost of installation/ placement of furniture (to be issued by BHEL as free issue item) as per requirement/ instruction of BHEL Engineer.** The Software installation and commissioning is not included in the scope of this contract. However, any assistance required for testing/ commissioning has to be provided by the contractor within the quoted price. Hardware found defective during testing/ commissioning and till handing over to Customer, have to be removed for repair/ replacement and reinstalled within the quoted rates.

(AG) ELECTRONIC WATER LEVEL INDICATOR SYSTEM

EWLI includes fixing of electrodes, local and remote indicator panel/ display units and interconnection of these by cables. Only cost of laying cables for interconnection of EWLI system shall be measured and paid separately. Erection of all other equipments/ panels/ display units forming EWLI system shall be included in the quoted rate per system.

(AH) CALIBRATION OF CONTROL VALVES

The work also includes minor rectification/ alterations in tubing, servicing of accessories, setting of limit switches, calibration of Actuators and position feedback transmitters.

(AI) SAMPLE HANDLING SYSTEM/ ANALYZER SYSTEM

Includes installation of main analyzer panel, analyzer, probes, sensors and other accessories like sample gas cylinders, mechanical/ electrical interconnections (including SS Tubing & Electrical heat Tracing, wherever required) between various components, energizing, testing & commissioning

(AJ) POWER CYLINDER ERECTION

Platforms on which Power Cylinders are to be mounted are usually provided by the Civil Contractor/ other agency. However minor structure work required shall form a part of the work within the quoted rate of the respective cylinder. Fabrication/ erection of stands for mounting of the cylinders The work also includes minor rectifications/ alteration in the tubing, servicing of accessories, setting of limit switches, calibration of actuators and feedback position transmitters.

(AK) CALIBRATION OF CONTROL VALVES

The work also includes minor rectification/ alterations in tubing, servicing of accessories, setting of limit switches, calibration of Actuators and position feedback transmitters.

54.0 TESTING, PRE-COMMISSIONING, COMMISSIONING AND POST-COMMISSIONING.

54.1 Site testing shall be required for all equipment installed by the contractor to ensure proper installation, setting, connection and functioning in accordance with drawings, specifications and manufacturer's recommendations.

54.2 Commissioning protocols are to be prepared as advised by BHEL Engineer for getting approved by customer/ Consultant.

54.3 Testing, and pre-commissioning checks shall be as per relevant codes/ practices and BHEL drawings/ specifications/ approved commissioning Protocols and same shall include, but not be limited to the following:

I. TRANSFORMERS

(a) Insulation resistance and earth resistance checks.
(b) Checking and calibration of WTI & OTI door interlock test etc.
(c) Winding resistance, vector group, turns ratio test on different taps, magnetizing current, core balance check etc.
(d) Turns ratio, polarity, insulation resistance and winding resistance checks on all CT’s.
(e) Bdv of oil, its centrifuging etc.

II. HT/ LT SWITCHGEAR PANELS:

(a) IR test of power and control circuits & High voltage test of Bus bar.
(b) Checking of protections and interlocks of all related schemes.
(c) Calibration of all indicating & metering instruments, relays, timers etc.
(d) Checking of operation of all relays and other protective devices e.g. CTs, PTs, thermal overload relays, single phasing preventers etc.
(e) Carrying out of suitable modifications as per system requirement.

(f) Operation of all illumination, space heating circuits etc.

III. BUSDUCTS

- Insulation and earth resistance checks. Cleaning of Busduct.
- High voltage test on Bus bars after drawing out VTs and disconnecting lightning arresters surge capacitors and other connected equipment e.g. generator, generator transformer etc.
- Torque testing of Bolted Connections
- Measurement of contact resistance of joints, bus bar loop resistance etc.
- Testing of CTs, VTs, NGT including primary and secondary injection tests.
- Making all arrangements for testing of the Generator, Gen Trf and UAT
- Testing pre-commissioning & trial run of Air Pressurization Equipment.

IV. BATTERY, BATTERY CHARGER, UPS

- Checking of battery charger panel.
- Calibration of all indicating and measuring instruments.
- Dummy load test of battery charger.
- Charging of battery and recharging after carrying out battery discharge test/ capability test of battery using dummy load.
- In the absence of regular power supply to battery chargers arrangements are to made for battery charging from temporary construction power supply points.

V. CONTROL & PROTECTION PANELS

(a) Checking of complete wiring and insulation resistance.
(b) IR test and loop checking of all field wiring in the panel.
(c) Checking of all protection, metering and indicating schemes.
(d) Calibration of all indicating and measuring instruments, relays, timers.
(e) Checking of all auxiliary schemes e.g. space heating, illumination.
(f) Checking of operation of all relays, switches and other indicators.
(g) Commissioning of total scheme including relevant internal equipment.
(h) Carrying out suitable modifications as per system requirement.
(i) Carrying out primary injection, secondary injection, stability checks etc.

VI. INSTRUMENTATION

(a) All instruments shall be checked for proper installation, supports, impulse lines, cabling etc. and corrected, wherever required.

(b) All instruments shall be calibrated before installation and proper calibration record shall be maintained to the satisfaction of BHEL Engineer. Instruments received in assembled condition in panels etc. shall also be dismantled, calibrated and re-assembled as per advise of BHEL Engineer.

(c) All impulse and pneumatic lines shall be properly cleaned (oil flushed/ chemical cleaned/ air blown/ steam blown/ Hydraulic tested etc.) before being charged.

(d) Some of the instruments may require re-calibration during commissioning. The contractor shall remove such instruments, recalibrate and install within the quoted rates.

(e) Various types of Control Panels- Turbine and its auxiliaries Protection Panels, Boiler and its auxiliaries Panels have to be checked.

VII. DRIVES AND CONTROLLERS

(a) All drives such as power cylinders, pneumatic/ motorised valves/ dampers etc. and controllers shall be checked for proper installation supports etc. before commissioning.

(b) All transmitters shall be calibrated and limit switches shall be adjusted.

(c) All pneumatic and impulse lines shall be cleaned as per instructions of BHEL Engineer.

(d) All drives shall be operated by simulating various conditions to ensure healthiness of components of the system

54.4 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 same shall be done as per Engineer's instructions including repair, rectification and replacement work by the contractor at his cost. The parts to be replaced shall be provided by BHEL.

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

54.6 During commissioning activities and for carrying out various tests, special instruments etc, have to be temporarily erected and commissioned to suit the commissioning activities. Contractor will provide the necessary equipment. Contractor has to carry out the erection, calibration, dismantling of the same. After completion of activities the temporary systems have to be removed and to be taken back at no extra cost to BHEL.

54.7 During erection of various equipment, prior to commissioning and after commissioning, protocols have to be made with BHEL's customer. The proforma and formats as approved have to be printed by the contractor in adequate numbers. The pre-commissioning activities will start with various trials, commissioning operations shall continue till units are handed over to customer. Simultaneous commissioning activities will be progress in various areas, checking of equipment erected, making ready for trial runs, all these works need specialised gangs including electricians/ instrument technicians in each area to render assistance to BHEL commissioning staff. Contractor shall earmark separate manpower for various commissioning activities. The manpower shall not be disturbed or diverted.

54.8 It shall be the responsibility of the contractor to provide workmen of various categories in sufficient numbers along with Engineers/ Supervisors including necessary consumables, T&P etc. during pre-commissioning, commissioning and post commissioning period for commissioning of equipment and attending any problem in equipment erected by the contractor till handing over. The rates quoted shall include all these contingencies also.

54.9 It shall be specifically noted that the above employees of the contractor may have to work round the clock alongwith BHEL commissioning Engineer and hence overtime payment by the contractor to his employees may be involved. The contractor's accepted rates shall be inclusive of all these factors also.

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

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

54.11 During commissioning, opening and closing of valves, attending to leakage, changing of gaskets, modifications in wiring, realigning of equipment, re-calibration of instrument, attending to leakage, minor adjustments of erected equipment may arise. The accepted rates shall include all such works.

55.0 FINISH PAINTING

All the equipment (bus duct, transformers, switchgears, control-panels etc.) within the scope of these specifications shall be received duly painted. The type of painting to be carried out as specified in the tender specification. For panels, during storage and handling the same may get peeled off/ damaged/ deteriorate. All such surfaces are to be thoroughly cleaned and to be touch up painted with suitable approved primer/ finish paint matching with shop paint/ approved final colour along with required tools and other consumables within the awarded price of contract.

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Besides above two coats of approved primer paint and at least two coats of approved finish paint to get the desired dry film thickness is to be applied on various loose equipment and all steel structures fabricated and erected at site.

All paints, tools and other consumables including scaffolding materials required for painting shall be arranged and provided by contractor within the quoted rates. Paint and other materials so purchased shall be ISI marked and as per drawing, documents and specifications and painting should be as per colour scheme and quality approved/ specified by Engineer. Valid Test certificate for the paint so supplied shall be made available before use of the same on work. The contractor shall provide legend on equipment in size specified by Engineer. Letter writing shall be done in Hindi/ English or in both languages. The printers have to under go test and only qualified painters will be allowed to work.

Certain equipment shall require spray painting (touch up). The contractor shall make arrangements of the required equipment for spray painting of such equipment ***including supply of paint,*** at his own cost. Spray painting at the job site shall be permitted only at times and locations approved by the owner/ Engineer.

56.0 FACILITIES TO BE PROVIDED BY BHEL/ CONTRACTOR

BHEL shall provide limited open space for office and store/ workshop at site free of rental charge. 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.

Electric power for office and workshop will be provided free of rental charge by BARSINGSAR at one point as decided by BHEL. Further distribution will have to be made by contractor.

Construction power, for construction purposes will be provided free at one point near erection site from supply point. Further distribution will have to be made by contractor. All wiring must comply with local regulations and will be subject to Engineer's inspection and approval before connecting supply. Required calibrated energy meter for measurement of power consumed has to be arranged / installed by Contractor at his cost.

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.

The land for labour colony shall be allotted by BARSINGSAR/ BHEL. Limited open space for labour colony shall be provided **on nominal rent of Rs. 1.00 (Rs. One only) per month for every five cent of land or part thereof** within a distance of five KMs from the site. The Contractor may build only temporary structure on the land for the purpose it is allotted. The land is not transferable in any manner either in whole or in part nor it can be utilized for the purpose of any other Contract. Contractor shall be responsible for providing all necessary facilities like residential accommodation, transport, electricity, water, medical facilities etc. as required under various labour laws and statutory rules and regulations framed there under to the personnel employed by him.

On completion/ termination of the work, the Contractor shall remove all temporary structure built by him and restore the land in its original condition and the land shall be handed over to BARSINGSAR. The Contractor at his cost shall remove debris generated from demolition of temporary structure. If the contractor fails to give vacant possession of the land as aforesaid in the original condition BHEL/ BARSINGSAR reserves the right to withhold payment of Contractors bill till handing over of the vacant possession of the land and contractor shall be liable to pay compensation determined by BHEL/ BARSINGSAR for such unauthorised occupation of land. The compensation shall be recovered from the bills of contractor, without any notice.

The Contractor shall be provided with **Electric Power on chargeable basis at one place only as decided by the BHEL in the labour colony**. The Contractor at his own cost will do further distribution. The Contractor at his own cost shall install the calibrated Energy meter for the electricity metering.

Free water supply at one point in the labour colony shall be provided. The Contractor at his own cost shall do further distribution.

The contractor shall submit to the Engineer his electrical power requirements. Construction power shall be provided free of charge at one point near erection site as required and to be decided by Engineer. Contractor at his cost shall do further distribution.

Water for construction purposes shall be provided free of charge at a one point within erection site. Contractor shall arrange further distribution of water for construction purposes.

Permanent lighting inside the powerhouse will be provided at a later stage. Till such time such arrangements are made, the contractor at his cost should arrange for temporary lighting in and around his work area.

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

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.

The contractor while drawing construction power 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 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.

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.

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.

Adequate lighting facilities such as floodlights, hand lamps and area lighting shall be arranged by the contractor at the site of construction, contractor’s material storage area etc.

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

Contractor shall install a computer with modem to connect with BHEL server (LAN) AT SITE.

57.0 TIME SCHEDULE

57.1 The contractor is required to commence the work within 10 days from the date of issue of letter of intent unless BHEL decides to fix any other later date. However, the actual date of start of work, to fix up zero date of the contract, will be certified by BHEL Engineer after adequate mobilisation of manpower and T&Ps by the contractor.

57.2 Entire work as detailed in tender specification **shall be completed within 12 months** from the scheduled date of start of work as per the programs/ milestones indicated by BHEL from time to time. Contractor has to mobilise adequate resources to meet BHEL's commitments to their customer as indicated from time to time.
In case due to reasons not attributable to the contractor, the work gets delayed and additional manpower/ resources have to be mobilized so as to expedite the work to meet various milestones, same shall be done within the quoted rates as per Rate Schedule, at no extra cost to BHEL. **In the event the contractor fails to respond to these requirements, BHEL shall take appropriate actions to meet customer's commitments in line with the provisions of General Conditions of Contract**:

57.3 The various mile stone dates to be achieved, for UNIT #1, as per the current status of contract are as below:

MILESTONES	**MONTHS**
• Start of Erection of this package	10 days from issue of LOI
• 6.6 KV system readiness & Start-up power`	2nd month
• Boiler Light-up readiness	3rd month
• Turbine on Barring Gear	5th Month
• Rolling & Synchronisation Readiness	6th Month
• Trial operation readiness & handing over	8th Month

The milestones of Unit # 2 shall follow with a time lag of Four months.

Notes:

Depending upon front and material availability all or some of the above milestones may be required to prepone by one month. Contractor is required to mobilise additional resources to meet above requirement within their quoted lumpsum price.

Contractor has to mobilise all required resources including manpower to achieve above schedule 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

57.4 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.

58.0 OVER RUN

58.1 In case due to reasons not attributable to the contractor, the work gets delayed and 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. 60,000/- (Rupees Sixty Thousand Only) per month on receipt of advance notice intending to claim over run & on fulfillment of following conditions:-

a) The reasons for delay in completion of work are not attributable to contractor but however subject to the provisions of clause - 31.
b) The targets fixed during the over run period are achieved by contractor.

58.2 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.

58.3 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.

59.0 TERMS OF PAYMENT

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

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

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

I. 90% of contract value shall be payable on fulfillment of following conditions:

(A) For Equipment/ items such as Panels, JB, impulse pipe, tubing etc. where no calibration and testing is required

a. 45% of item rate shall be payable on erection/ installation/ cable laying
b. 25% of item rate on final alignment, welding, clamping, termination etc.
c. 15% of item rate on testing, pre-commissioning, charging etc. (with certification of BHEL commissioning Engineer)
d. 5 % of item rate on pending point clearance

(B) For equipment/ items where calibration and testing is required.

(i) 20% of item rate on calibration and testing
(ii) 30% of item rate on erection, installation alignment and termination wherever involved.
(iii) 20% of item rate on individual device loop checking/hydro test/ charging of installation and panels.
(iv) 15% of item rate on system loop checks, pre-commissioning checks by simulation/ field calibration or with actual system operation.
(v) 5 % of item rate on pending points clearance.

NOTE:-Further percentage break up for payments against above, if required will be mutually discussed and finalised at site.

II Milestone payments - 5 % of awarded Contract value (CV)

2 x 0.25% of CV on 6.6 KV System readinesses for charging.
2 x 0.50% of CV on readiness for Boiler Light-up.
2 x 0.25 % of CV on SPB Bus duct HV Test.
2 x 0.50 % of CV on Isolated phase busduct readiness for charging.

2 x 0.25% of CV on Unit Synchronization.
2 x 0.25% of CV on Unit trial operation.
2 x 0.5 % of CV on completion of Coal firing of Unit.

NOTE: If the commissioning activities could not be carried out due to no fault of contractor, BHEL Site incharge, at his discretion, after recording reasons for exercising such option, can split and release payment upto 50% of milestone payment on completion of work, to the extent possible, required for carrying out that particular milestone/ commissioning activities.

NOTE: Further percentage break up for payments against above, if required will be mutually discussed and finalised at site.

III 2.5% of CV shall be payable on handing over of the unit to BHEL's customer or 3 months after the contractor has discharged his responsibilities as stipulated in this contract, whichever is earlier, provided delay in handing over of the unit is not attributable to contractor. The unit shall be deemed to be handed over on completion of trial operation.

IV The balance 2.5% of contract value will be payable on completion of all pending work, rework wherever required, reconciliation of materials, clearance of site and labour colony area in all respects and on submission and passing of final bill.

NOTE: **Above payment at III & IV shall be released after adjustment of the contract value based on actual work carried out.**

Annexure-I

LIST OF T&Ps AND IMTEs BEING PROVIDED BY BHEL FREE OF HIRE CHARGES ON SHARING BASIS

SL No.	EQUIPMENT	QTY	Remarks
1.	Suitable capacity crane (14/ 20 T)	1 No.	
2.	EOT crane in TG hall	1 No	

NOTES:

1. In addition to above any special tools and tackles, if supplied by the manufacturer will also be provided to the contractor free of hire charges as and when made available.

2. BHEL at entirely its discretion may provide hire capacity crane for handling equipment which cannot be handled with above crane or any of the lifting tackles of the contractor deployed in this contract. The fuel and operation of such crane shall be in the scope of contractor. All other clauses shall be as per the clauses applicable for the T & P Items specified in this contract.

3. Other terms and conditions regarding above items shall be as per tender clause 37. (Tools and Plants/ IMTEs)

Annexure-II

INDICATIVE LIST OF T & P TO BE ARRANGED BY THE CONTRACTOR

Sl.No.	EQUIPMENT	QTY
1.	20T Capacity trailer with pulling unit/ Truck	01 no./ As per requirement
2.	Oil Filteration Machine suitable for HT Transformers with oil tank	As per requirement
3.	Suitable capacity Hydraulic jacks for handling of HT transformers	Adequate Nos
4.	MIG/ TIG Welding Machine for aluminium welding	Adequate Nos.
5.	Welding Transformers / Welding generators	Adequate Nos. (min. 6 nos)
6.	Gas cutting set	Adequate Nos.
7.	Grinders	Adequate Nos.
8.	Calibrated Torque wrenches for Bus duct application	2 Sets/ as per requirement
9.	Pedestal mounted Drill Machine	1 No.
10.	Vacuum Cleaner	1 No.
11.	Hydraulic crimping tool	2 Nos.
12.	Hand crimping tools	Adequate Nos.
13.	Industrial vacuum cleaner	1 No
14.	Blower	1 No
15.	Hydraulic pipe bending machines	2 nos.
16.	Hydraulic test Pump	1 No.

NOTEs:

1. The above list specifies only major T&Ps (may not be complete to be deployed by the contractor) to be deployed as per site requirement. All additional/ other tools and plants in good and safe working conditions which are required for satisfactory & timely completion of work shall also be deployed by the contractor within finally accepted rates.

2. In case, the contractor fails to provide the above mentioned minimum tools & plants/ equipments, under the scope of contractor, the later shall have right to hire such services from other agencies at the risk and cost of the contractor as per the works requirement, on the sole discretion of the Construction Manager.

3. Other terms and conditions regarding above items please also refer clause 37 (T&Ps/ IMTEs).

Annexure-III

Indicative list of IMTEs to be arranged by the **CONTRACTOR** for **ELECTRICAL and Control & Instrumentation**

Sl. No.	EQUIPMENT	QTY
1.	100V/ 250V/ 500 V/ 1000V, (Hand operated) megger	1 No.
2.	2.5/ 5 KV (Motor operated megger)	1 No.
3.	Transformer Oil Testing Kit (Motor operated) 0-100 KV	as required
4.	HV Test Kit (ac/dc) 0 to 60 KV (100mA leakage current)	1 Set
5.	Digital Multimeters with current probe	8 Nos
6.	Primary Injection Kit	1 Set
7.	Secondary Injection Kit	1 Set
8.	Relay Testing Kit	1 Set
9.	Tong Testers (various ranges, ac/ dc) including mA Range	4 Sets
10.	Micro ohm meter with 100Amps DC Source	1 Set
11.	KELVINE DOUBLE BRIDGE (for low resistance measurement)	as required.
12.	PPM Measuring Kit	as reqd.
13.	Mill volt drop test kit with 100 Amps source	as required
14.	Analog Multimeter	2 Nos
15.	Single/ three phase variac	1 each
16.	Motor checker	1 No
17.	Leakage meter	1 No

For The Calibration of Instrumentation equipments:

S.NO.	DESCRIPTION	RANGE	ACCURACY	QTY
1.	Dead Weight Tester	0-600Kg/cm2	LC-0.5Kg/cm2	01 Set
2.	Comparison test set (With Sub-standard Pressure gauges)	0-1 Kg/cm2	±0.25% Lc-0.02Kg/cm2	01 Set
		0-4 k g/cm2	-----do----------	
		0-6 Kg/cm2	-----do----------	
		0-10kg/cm2	-----do----------	
		0-25Kg/cm2	+0.25%Lc-0.25 Kg/cm2	
		0-60Kg/cm2	1±0.25%Lc-1.0 Kg/cm2	
		0-250Kg/cm2	±0.25%Lc-2.5 Kg/cm2	
		0- 400Kg/cm2	±0.25%Lc-2.5 Kg/cm2	
3.	Variable DC regulated (Electronic voltage source with digital indication).	0-30V DC	0.2%	1 No
4.	Oil bath with thermostat, Stirrer and sub-standard Glass Thermometers in Multiple ranges	0-300 Degree Cel.		1 set.
5.	Glass U tube mercury mano-meter with standard steel Scale	0-760 mm		As per requirement

S.NO.	DESCRIPTION	RANGE	ACCURACY	QTY
	having leveling arrangement.			
6.	Glass U tube mercury mano-meter with standard steel Scale having leveling arrangement.	0-1000 mm		As per requirement
7.	mA/mV source with Digital display.	0-200 mA/200mV		01 No.
8.	Rehostat	100 Ohm , 10 A		03 Nos.
9.	Precision Digital Multimeter	4-1/2 Digits		01 No.
10.	Digital multimeters	3-1/2 Digits		04 Nos
11	High temp. instrument Calibration kit	upto 600 deg.		01 No
12	Decade Resistance box	upto 10 L ohms		01 No
13	500 V / 1000V, (Hand operated) megger			01 No
14	Single phase variac	15 A		01 No.
15	Hydraulic test pump	upto 250 Kg/mm2	+0.25 %	01 No.
16	Continuity testers		as per requirement.	
17	Intercom / telephone set for loop checking		as per Requirement.	

Notes:

1. 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.

2. Contractor must re-ascertain/ recheck range and accuracy of each IMTE from BHEL Engineer well in advance before arranging calibration/ deployment of IMTE's

3. Other terms and conditions regarding above items shall be as per clause no. 37 (Tools & plants/ IMTEs).

Annexure - IV

List of items for Electrical and Control and Instrumentation package

The quantities mentioned below are tentative and may very as per the actual engineering/ requirement to complete the package for electrical and C & I work. Some of the items may be added or deleted which shall have to be executed by the contractor within his scope of work. The decision of BHEL in this regard shall be final and binding.

SL NO	ITEM NO.	DESCRIPTION	UNIT	QTY
1	2	3	4	5
1	***GROUP I***	***ELECTRICAL EQUIPMENTS***		
2	**IA**	**LT SERVICE TRANSFORMERS (dry type/ oil cooled type) including all accessories, piping, cabling etc. Transportation from stores/ storage yard to erection site, assembly, testing & commissioning of**		
3	**IA.1**	LT SERVICE TRANSFORMERS (DRY TYPE) 6.6/ 0.433kv, Dyn11, 1600 KVA, 6500KG approx.	No.	14
4	**IA.2**	LT SERVICE TRANSFORMERS (DRY TYPE) 6.6/ 0.433kv, Dyn11, 1000KVA, 5600 KG approx.	No.	2
5	**IA.3**	Excitation TRANSFORMERS (DRY TYPE) 6.6/ 0.433kv, Dyn11, 775 KVA, 4500 KG approx.	No.	2
6	**IA.4**	LTG TRF Dyn1, 415/ 433V.	No.	4
7	**IA.5**	Neutral Grounding Resistor for MV system (UAT & ST system earthing)	set	6
8	**IA.6**	VFD ONAN TRANSFORMER for ID FAN - Transformers (2.1 MVA, 6.6 KV / 725 V, 7500 KGS appx.),	No.	4
9	**IA.7**	VFD TRANSFORMER for SA COMP. 6.6/0.433 KV, 750 KVA	No.	2
10	**IA.8**	Testing & commissioning of Emergency DG control panels along with accessories like battery, battery chargers, associated cables etc.	set	2
11	**IB**	**ISOLATED PHASE BUS DUCT FOR GENERATOR, UAT AND GENERATOR TRANSFORMER, BUSDUCT MOUNTED GENERATOR CIRCUIT BREAKER / ISOLATOR**		

12	**IB.1**	Transportation from stores/ storage yard to erection site, assembly, erection, welding, testing & commissioning of Isolated Phase Bus Duct (10.5 kV, 10 KA) for interconnection of Generator, UATs & Generator Transformer along with all accessories & auxiliaries. Approx. length per unit: - a) 1000 dia duct length, 3x 53 M b) 780 dia duct length, 3 x 18 M.	Set	2
13	**IC**	**SEGREGATED PHASE BUS DUCT 6.6 kV**		
14	**IC.1**	Transportation from stores/ storage yard to erection site, assembly, erection, welding, testing & Commissioning of SEGREGATED PHASE BUS DUCT (6.6 KV, 2000A) for interconnection of UAT TO 6.6 KV UNIT SWITCHGEAR, STATION SWITCHGEAR AND TIE DUCTS BETWEEN SWGR, Approx 95 Enclosures of size (400 (H) X 1200 (B) (Total length 430 Mtrs (Approx), along with all Structures, Misc accessories (Approx 9.0 MT). Approx. size & length for both units:- 4000A (size 600x 1800mm), length 170 M, b) 2000A (size450x 1350mm), length 260 M.		
15	**IC.1.1**	from station transformer to 6.6 KV board	set	2
16	**IC.1.2**	from Unit auxiliary transformer to 6.6 KV board	set	4
17	**IC.1.3**	from Unit & station 6.6 KV board #1 to unit-station 6.6 KV board # 2, station board to station board	set	3
18	**ID**	**6.6 kV INDOOR SWITCHGEAR - EACH BOARD CONSISTING OF VACUUM BREAKER TYPE VM 12, PT PANELS, AUXILIARY TRANSFORMER PANEL, BUS EXTENSION CHAMBERS & ACCESSORIES Etc. EACH BREAKER IS HOUSED WITH CONTROL, METERING & PROTECTION DEVICES.**		
19	**ID.1**	Unit Switchgear Board 1CA/ 1CB/2CA/ 2CB: consists of approx. 14 panels or less / more. Approx. Dimension 15580 x 2651 x 2692.	Set	4
20	**ID.2**	Unit Switchgear Board 0CA/ 0CB: consists of approx. 16 panels or less/ more. Approx. dimension 9020 x 2651 x 2692.	Set	2
21	**ID.3**	Unit Switchgear Board OCC: consists of approx. 12 panels or less / more. Approx. dimension 13940 x 2651 x 2692.	Set	1
22	**IE**	**LT SWITCHGEAR - TRANSPORTATION FROM STORES/ STORAGE YARD TO ERECTION SITE, ASSEMBLY, ERECTION, TESTING & COMMISSIONING OF 415 V LT SWITCH GEAR BOARDS/ MCC, DOUBLE FRONT/ SINGLE FRONT, COMPRISES OF AIR CIRCUIT BREAKERS, PT PANELS, AUX. TRANSFORMER PANEL, TRUNKING CUBICLE Etc. Panel shall be supplied in loose shipping section.**		
23	**IE.1**	· 415 V, Unit Swbd, 2500A - 1DA, 2DA	No.	2
24	**IE.2**	· 415 V, Boiler MCC, 630A - 1HA, 2HA	No.	2

25	**IE.3**	· 415 V, Boiler Valve MCC, 250A - 1HB, 2HB	No.	2
26	**IE.4**	· 415 V, Turbine MCC, 630A -1KA. 2KA	No.	2
27	**IE.5**	· 415 V, Turbine Valve MCC, 250A -1KB. 2KB	No.	2
28	**IE.6**	· 415 V, Unit Service ACDB, 400A - 1QA, 2QA	No.	2
29	**IE.7**	· 415 V, Emergency PMCC, 1000A - 1DG, 2DG	No.	2
30	**IE.8**	· 415 V, Emergency DG SWBD, 1000A - 0DG	No.	1
31	**IE.9**	· 415 V, ESP SWBD, 2500A - 1DB, 2DB	No.	2
32	**IE.10**	· 415 V, Lighting SWBD, 1600A - 0DF	No.	1
33	**IE.11**	· 415 V, STN Service SWBD, 2500A - 0DA	No.	1
34	**IE.12**	· 415 V, Fuel Oil House MCC, 400A - 0QA	No.	1
35	**IE.13**	· 415 V, A/C & Ventilation SWBD, 1600A - 0DB	No.	1
36	**IE.14**	· 415 V, Ventilation MCC, 100A - 1TA, 2TA	No.	2
37	**IE.15**	· 415 V, Lime Stone Milling SWBD, 2500A - 0DC	No.	1
38	**IE.16**	· 415 V, Lime Stone Conveyers MCC, 2500A – 0QB	No.	1
39	**IE.17**	· 433 V, Emergency Lighting DB – 1, 2	No.	2
40	**IE.18**	· 433 V, Main Lighting DB – 1, 2	No.	2
41	**IE.19**	· 220 V, Unit DCDB – 1FA, 2FA	No.	2
42	**IE.20**	· 220 V, Station DCDB – 0FA	No.	1
43	**IF**	**NON SEGREGATED LV 415 VOLT BUSDUCTS Transportation of material From Stores/ storage yard to erection site, Erection, Assembly, Testing & Commissioning of NSP BUS DUCTS for interconnection between service transformer and LT MCC.**		
44	**IF.1**	**415 Volt LT Interconnecting NON SEGREGATED BUS DUCT** between LT dry type Transformer of (2000 KVA/ 1600 KVA/1000 KVA, 415V rating. Loose items like silicagel breather pipe, GI channel supports and associated accessories.	set	16
45	**IG**	**DIGITAL STATIC EXCITATION SYSTEM/ SEE TRANSPORTATION FROM STORES/ STORAGE YARD TO ERECTION SITE, ASSEMBLY, ERECTION, TESTING, & COMMISSIONING OF DAVR EXCITATION SYSTEM**		
46	**IG.1**	Transportation from store/ storage yard to erection site, Erection, Assembly, Testing & Commissioning of **AVR/ SEE Excitation Equipments/ System**, System consist of a) Regulation cubicle b) Thyristor cubicle c) field suppression panels d) transformer cubicle (1550L X 1250H X2324W MM) e) cable box & Interpanel looping and associated cables upto Main Exciter/ PMG cubicle	Set	2

48	**IH**	Transportation from stores/ storage yards to erection site, erection, assembly, testing & commissioning of **VARIABLE FREQUENCY DRIVE SYSTEM FOR ID FANS** consist of VFD Panels (2500X600X1800MM, 4nos.), Brake Resistor Panels (1000X800X1300MM, 4nos.), Vacuum Breakers panels (1800X1800X2400MM, 4nos.) and associated accessories, Interpanel cabling/ looping cables supplied alongwith system.	Set	4
49	**II**	**GENERATOR, GT, ST & UAT PROTECTION & METERING PANELS: TRANSPORTATION FROM STORES/ STORAGE YARD TO ERECTION SITE, ASSEMBLY, ERECTION, TESTING, & COMMISSIONING (integrated electrical testing comprising of relay testing, functional checks of control protection circuit etc) OF GRP, Bus transfer panels etc.**		
50	**II.1**	**Generator Relay Panels**, Over all dimension of each panels 6000x1000x2295 mm, Four-Five panels/ Unit.	sets	2
51	**II.2**	**Bus Transfer System,** Two panels/ Unit, Approx. dimensions 800*800*2345 mm.	sets	2
52	**II.3**	DC STARTER PANELS FOR BOILERS	No.	18
53	**IJ**	**SOOT BLOWER SYSTEM: TRANSPORTATION FROM STORES/ STORAGE YARD TO ERECTION SITE, ASSEMBLY, ERECTION, TESTING, & COMMISSIONING OF 415 VOLT ELECTRICAL SYSTEMS OF SOOT BLOWERS COMPRISING OF SOOT BLOWER LOCAL STARTER BOXES, LOCAL POWER DISTRIBUTION BOXES WITH ACCESSORIES ALONG WITH COMMISSIONING OF THE SOOT BLOWERS.** (ERECTION OF THE SOOT BLOWERS IS EXCLUDED)		
54	**IJ.1**	Soot Blower Motor Control Center, double front, overall dimension 6460(W) x243000 (H) x900 (D), shall be supplied in six to eight loose shipping sections	Set	2
55	**IK**	**DC BATTERY SYSTEM (220 V DC AND 24 VOLT DC SYSTEM Transportation of material from Stores/ storage yard to erection site, Erection, Assembly, Testing & Commissioning of 220 VOLT BATTERY/ BATTERY CHARGER, 24 VOLT BATTERY/ BATTERY CHARGER FOR SG, TG & STATION C&I.FOPH, CWPH ETC.**		
56	**IK.1**	220 Volt DC Float Cum Boost Chargers Approx Size 1600 x 1000 x 2000 mm, Approx Weight 3500 IKgs	**Nos**	**4**
57	**IK.2**	**220 Volt, STATION DC Battery System, Each set comprises of Battery system. (110 nos, 2.1 volts, Battery Shall be mounted on teak wood still age & loose accessories such as inter cell/ stack connectors etc shall be supplied loose.**	**Sets**	**1**

58	**IK.3**	**220 Volt UNIT DC Battery System**, Each set comprises of Battery system. Battery Shall be mounted on teak wood still age & loose accessories such as inter cell/ stack connectors etc shall be supplied loose. Details given in tender elsewhere.	**Sets**	**2**
59	**IK.4**	24 Volt DC Battery System - Float Cum Boost Chargers, Battery sets	**Sets**	**2**
60	**IL**	**Various types of local push buttons**	**No**	**120**
61	***GROUP II***	***STATION CABLES, CABLE TRAYS - (Laying, Dressing, tagging, ferrulling, Clamping, Termination); Cable Tray Erection including Supports fabrication/ erection;***		
62	**IIA**	**6.6 KV XLPE POWER CABLES (AL CONDUCTOR, ARMOURED / UNARMOURED)**		
63	**IIA.1.1**	**1C X 630 SQ MM**	Mtr	**13000**
64	**IIA.1.2**	**3C X 185 SQ MM**	Mtr	**16000**
65	**IIB**	**LT Power cables (armoured/ unarmoured) laying, dressing, clamping & termination, Control/ Signal cables (armoured) laying, dressing, clamping & termination.**		
66	**IIB.1**	**LT POWER CABLES PVC INSULATED, ARMOURED (AL/ COPPER CONDUCTOR)**		
67	**IIB.1.1**	1 C X630 SQ MM	Mtr	40000
68	**IIB.1.2**	1 C X400 SQ MM	Mtr	10000
69	**IIB.1.3**	1C X 185 SQ MM	Mtr	4000
70	**IIB.1.4**	1C X 70 SQ MM	Mtr	2000
71	**IIB.1.5**	1C X 35 SQ MM	Mtr	3500
72	**IIB.1.6**	1C X 10 SQ MM	Mtr	2500
73	**IIB.1.7**	2C X120 SQ MM	Mtr	300
74	**IIB.1.8**	2C X 95 SQ MM	Mtr	8000
75	**IIB.1.9**	2C X 50 SQ MM	Mtr	300
76	**IIB.1.10**	2C X 25 SQ MM	Mtr	15000
77	**IIB.1.11**	2C X 6 SQ MM	Mtr	1500
78	**IIB.1.12**	2C X 2.5 SQ MM	Mtr	45000
79	**IIB.1.13**	3C X 400 SQ MM	Mtr	300
80	**IIB.1.14**	3C X 240 SQ MM	Mtr	2500
81	**IIB.1.15**	3C X 120 SQ MM	Mtr	1200
82	**IIB.1.16**	3C X 95 SQ MM	Mtr	1200
83	**IIB.1.17**	3C X 50 SQ MM	Mtr	2700
84	**IIB.1.18**	3C X 35 SQ MM	Mtr	5200
85	**IIB.1.19**	3C X 25 SQ MM	Mtr	5200
86	**IIB.1.20**	3C X10 SQ MM	Mtr	9000
87	**IIB.1.21**	3C X 6 SQ MM	Mtr	300
88	**IIB.1.22**	3C X 2.5 SQ MM	Mtr	55000
89	**IIB.1.23**	3.5C X 240 SQ MM	Mtr	1800
90	**IIB.1.24**	3.5C X 120 SQ MM	Mtr	1000
91	**IIB.1.25**	3.5C X 70 SQ MM	Mtr	1800
92	**IIB.1.26**	3.5C X 50 SQ MM	Mtr	5000
93	**IIB.1.27**	3.5C X 25 SQ MM	Mtr	20000
94	**IIB.1.28**	3.5C X 4 SQ MM	Mtr	16000
95	**IIB.2**	**LT CONTROL CABLE (COPPER CONDUCTOR, ARMOURED PVC CONTROL)**		

96	**IIB.2.1**	2C X 1.5 SQ MM	Mtr	22000
97	**IIB.2.2**	3C X 1.5 SQ MM	Mtr	30000
98	**IIB.2.3**	5C X 1.5 SQ MM	Mtr	36000
99	**IIB.2.4**	12C X 1.5 SQ MM	Mtr	70000
100	**IIB.2.5**	5C X 2.5 SQ MM	Mtr	40000
101	**IIB.2.6**	7C X 1.5 SQ MM	Mtr	25000
102	**IIB.2.7**	10C X 2.5 SQ MM	Mtr	100
103	**IIB.2.8**	12C X 2.5 SQ MM	Mtr	100
104	**IIB.2.9**	19C X 2.5 SQ MM	Mtr	8000
105	**IIB.2.10**	5C X 4 SQ MM	Mtr	500
106	**IIB.3**	**SCREENED CONTROL CABLE, 600V INSTRUMENT OVERALL / INDIVIDUAL SCREENED, ARMOURED / UNARMOURED CABLE FRLS (TYPE–G) / TYPE- F CABLE / special type of cable**		
107	**IIB.3.1**	2PX 0.5SQ MM	Mtr	90000
108	**IIB.3.2**	4PX 0.5 SQ MM	Mtr	150000
109	**IIB.3.3**	6PX 0.5 SQ MM	Mtr	55000
110	**IIB.3.4**	8PX 0.5 SQ MM	Mtr	120000
111	**IIB.3.5**	10P/12P/16P X 0.5 SQ MM	Mtr	50000
112	**IIB.3.6**	24PX 0.5 SQ MM	Mtr	20000
113	**IIB.3.7**	1P/2C x 1.5 / 2.5 sqmm	Mtr	32000
114	**IIB.3.8**	2P/ 3C /4C x 1.5 / 2.5 sqmm	Mtr	65000
115	**IIB.3.9**	5C/7C x 1.5 /2.5 sqmm	Mtr	80000
116	**IIB.3.10**	10C/12C x 1.5 /2.5 sqmm	Mtr	35000
117	**IIB.3.11**	19C x 1.5 /2.5 sqmm	Mtr	15000
118	**IIB.3.12**	Copper Cable 2 or 3 triad, 0.5/1.5 sqmm armoured/ unarmoured	Mtr	4000
119	**IIB.3.13**	Copper Cable 6 triad, 0.5/1.5 sqmm armoured/ unarmoured	Mtr	500
120	**IIB.3.14**	Network UTP Cables (special termination using UTP connectors involved)	Mtr	25000
121	**IIB.3.15**	Compensating cable 2P x .5sqmm	Mtr	1000
122	**IIB.3.16**	Compensating cable 2P x 1.31 sqmm type Tx/Sx/Kx unarmoured/ armoured	Mtr	6000
123	**IIB.3.17**	Compensating cable 4P x 1.31 sqmm type Tx/Sx/Kx unarmoured/ armoured	Mtr	18000
124	**IIB.3.18**	Compensating cable 6P x 1.3 sqmm type Tx/Sx/Kx unarmoured/ armoured	Mtr	500
125	**IIB.3.19**	Laying, etc of Single Mode Optical fibre cables on cable trays, conduits etc with minor civil works	Mtr	14000
126	**IIB.3.20**	Laying, etc of Multi Mode Optical fibre cables on cable trays, conduits etc with minor civil works	Mtr	6000
127	**IIC**	**CABLE TRAYS Erection including supports & covers fabrication and its accessories (with or without covers) and cable tray covers, complete with formed channels, pipes, gi flat, bolt with nut- washer**		
128	**IIC.1**	**LADDER / PERFORATED TYPE/ BOTTOM**		
129	**IIC.1.1**	600 MM WIDE	Mtr	30000
130	**IIC.1.2**	450 MM WIDE	Mtr	4500
131	**IIC.1.3**	300 MM WIDE	Mtr	9000
132	**IIC.1.4**	150 MM WIDE	Mtr	5000
133	**IIC.1.5**	100 MM WIDE	Mtr	8000

134	IIC.1.6	50 MM WIDE	Mtr	4500
135	IIC.2	**CABLE TRAY ACCESSORIES**		
136	IIC.2.1	90 DEG HORIZONTAL BEND LADDER TYPE 600MM RADIUS/ 90 DEG VERTICAL BEND LADDER TYPE 600MM RADIUS (INSIDE/ OUTSIDE)/ TEES LADDER TYPE 600MM RADIUS, CROSSE LADDER TYPE		
137	IIC.2.2	600 MM WIDE	No.	1050
138	IIC.2.3	450 MM WIDE	No.	70
139	IIC.2.4	300 MM WIDE	No.	845
140	IIC.2.5	150 MM WIDE	No.	100
141	IIC.3	REDUCERS LADDER TYPE (50 LHS/ 50 RHS)		
142	IIC.3.1	600MM - 450MM	No.	30
143	IIC.3.2	600MM - 300MM	No.	20
144	IIC.3.3	450MM - 300MM	No.	10
145	IIC.3.4	300-150 MM WIDE	No.	20
146	IIC.4	**CABLE TRAYS SUPPORT (HOT DIP GALVANISED STRUCTURAL STEEL) and TRAY SUPPORT SYSTEM (GS ANGLE / ISMC STEEL) FABRICATION AND INSTALLATION**		
147	IIC4.1	ISMC - 150 (3.0 MTR LENGTH)	TON	20
148	IIC4.2	ISMC - 150 (3.25 MTR LENGTH)	TON	11
149	IIC4.3	ISMC -100 (3.0 MTR LENGTH)	TON	1
150	IIC4.4	ISMC -75 (3.25 MTR / 3.0 MTR LENGTH)	TON	4
151	IIC4.5	ISA 50 X 50 X 6 (3.0 MTR LENGTH)	TON	18
152	IIC4.6	ISA 50 X 50 X 6 (3.25 MTR LENGTH)	TON	1.2
153	IIC.5	**CABLE TERMINATION**		
154	IIC.5.1	**6.6KV TERMINATION FOR 6.35/11 KV, XLPE INSULATED ALUMINIUM CABLE**		
155	IIC.5.1.1	1CX630 SQ.MM.(ARMOURED / UNARMOURED)	No.	56
156	IIC.5.1.2	3CX185 SQ.MM. (ARMOURED / UNARMOURED)	No.	65
157	IIC.5.2	**HT / LT Power Cable straight through jointing**		_
158	IIC.5.2.1	1CX630 SQ.MM. (ARMOURED / UNARMOURED)	No.	18
159	IIC.5.2.2	3CX185 SQ.MM. (ARMOURED/ UNARMOURED)	No.	4
160	IIC.5.2.3	1.1 KV, XLPE cable, 1CX630 Sq.mm	No.	4
161	IIC.5.2.4	1.1 KV, XLPE cable, 1CX300 Sq.mm	No.	2
162	IIC.5.2.5	1.1 KV, XLPE cable, 2CX35 Sq.mm	No.	2
163	IIC.5.2.6	1.1 KV, XLPE cable, 3.5 C X 50 Sq.mm	No.	1
164	IIC.5.2.7	1.1 KV, XLPE cable, 3.5 C X 35 Sq.mm	No.	2
165	IIC.6.1	**TREFOIL CLAMPS(COMPLETE WITH FIXING HARDWARE)**		
166	IIC.6.1.1	6.6KV GRADE,1C - 630 AL, XLPE CABLE of 51mm dia	No.	1300
167	IIC.6.1.2	1.1KV GRADE,1C - 630 AL, PVC CABLE of 45 mm dia	No.	4000
168	IIC.6.1.3	1.1KV GRADE,1C - 400 AL, PVC CABLE of 38mm dia	No.	600
169	IIC.6.1.4	1.1KV GRADE,1C - 185 AL, PVC CABLE of 30mm dia	No.	500
170	IIC.7	**Fabrication and installation of Structural steel**	MT	100
171	IID	**FIRE SEALING SYSTEM**		
172	IID.1	FIRE STOP MATERIAL FOR OPENINGS BELOW PANELS, AT WALLS AND AT FLOORS	SQM	20

173	**IIE**	**CONDUITS (GALVANISED MS RIGID / FLEXIBLE GI / PVC)**		
174	**IIE.1**	GALVANISED MS RIGID CONDUITS		
175	**IIE.1.1**	50 MM DIA	Mtr	100
176	**IIE.1.2**	75 MM DIA	Mtr	100
177	**IIE.1.3**	200 MM DIA	Mtr	50
178	**IIE.2**	**FLEXIBLE GI CONDUITS**		
179	**IIE.2.1**	25 MM DIA	Mtr	100
180	**IIE.2.2**	150 MM DIA	Mtr	50
181	**IIE.3**	**PVC CONDUITS**		
182	**IIE.3.1**	150 MM DIA	Mtr	50
183	**IIE.3.2**	200 MM DIA	Mtr	50
184	**IIE.4**	BELL MOUTH FOR PVC CONDUITS		
185	**IIE.4.1**	150 MM DIA	No.	5
186	**IIE.4.2**	200 MM DIA	No.	5
187	**IIE.5**	**CABLE DUCTS**		
188	**IIE.5.1**	Cable duct 60 x 60 x 1000	Mtr	400
189	**IIE.5.2**	Cable duct 100 x 100 x 1000	Mtr	120
190	**IIE.5.3**	Cable duct 180 x 100 x 1000	Mtr	100
191	**IIE.5.4**	Cable duct 250 x 60 x 1000	Mtr	60
192	**IIF**	**ABOVE EQUIPMENT EARTHING GROUND EARTHING & LIGHTNING PROTN WITH FIXTURES**		
193	**IIF.1.1**	GS FLAT 75 X 10 mm	Mtr	250
194	**IIF.1.2**	GS / MS FLAT 50 X 6 mm	Mtr	10000
195	**IIF.1.3**	GS FLAT 30 X 5 mm	Mtr	100
196	**IIF.1.4**	GS FLAT 25 X 6 mm	Mtr	8000
197	**IIF.1.5**	GS FLAT 25 X 3 mm	Mtr	5000
198	**IIF.1.6**	G S WIRE 3.15 MM / 8 SWG GI STRANDED WIRE / GI earthing wire	Mtr	6500
199	**IIF.1.7**	FLEXIBLE BRAIDED CONDUCTOR of 600 mm length/300 sqmm approx. WITH TINNED COPPER CLAMP CONNECTED BY U BOLT FOR EARTHING.	No.	50
200	**IIF.1.8**	GI Pipe (1/2", 1") Heavy grade	Mtr	500
201	**IIF.1.9**	GI Pipe (1.5 ", 2")	Mtr	50
202	**IIG**	**LIGHTNING PROTECTION SYSTEM**		
203	**IIG.1.1**	20 DIA, 1 M LONG GS ROD FOR VERTICAL AIR TERMINATION	No.	90
204	**IIG.1.2**	TEST LINK WITH 150X150X6 THICK GS PLATE WITH BOX.	No.	90
205	**IIG.1.3**	HOT DIP GALVANIZED MS SHEET (64SWG) FOR COVERING OF CABLE SHAFT (SIZE 2000MM* 1000MM MIN.)	SQM	400
206	**IIG.1.4**	ELECTRODES IN TEST PITS GI PIPE, 100D, 1.3MM THICK & 3.75M LONG	No.	55
207	***GROUP III***	***C & I ITEM DESCRIPTION***		
208	**IIIA**	**PANELS / CONSOLES / RACKS**	-	-
209	**IIIA-1**	CONTROL CABINETS FOR S.G. (800L X 2415H X 750W)	No.	28
210	**IIIA-2**	CONTROL CABINETS FOR T.G. (800L X 2415H X 750W)	No.	42

211	**IIIA-3**	E & C FOR Furnace temperature probe INCLUDING STARTER BOX, THERMOCOUPLES, SOLENOIDS ETC.	No.	6
212	**IIIA-4**	STATION C&I FUNCTIONAL GROUP CONTROL PANELS	No.	97
213	**IIIA-5**	REMOTE I/O PANELS	No.	2
214	**IIIA-6**	RELAY PANELS	No.	10
215	**IIIA-7**	Unit Control Panel	No.	2
216	**IIIA-8**	ELECTRICAL CONTROL PANEL 1900x1000x2355	No.	2
217	**IIIA-9**	Generator Instrumentation cabinet including annunciator (1230 x 1060 x 2550)	No	4
218	**IIIA-10**	Vibration monitoring system for Fans and Pulverisers	Set	8
219	**IIIA-11**	Vibration monitoring system for main turbine	Set	4
220	**IIIA-12**	Vibration monitoring system for BFP/CEP/ACWP/CWP	Set	4
221	**IIIA-13**	DC motor starter box for scanner fan	No	4
222	**IIIA-14**	Mill inerting system control box 755 X 340 X 1345, local mounted	No.	12
223	**IIIA-15**	Control panels for Centrifuges	No.	8
224	**IIIA-16**	Gr. Feeder local Control Panel (1000 x 600 x 300), 77 kg,	No.	14
225	**IIIA-17**	Conrol Panel for HP dosing system (1000x800x2000, 3.0 MT)	No	4
226	**IIIA-18**	Burner Tilt Shear Pin Failure Indication Box	No.	4
227	**IIIA-19**	Air Heater Rotor Stoppage Alarm Box	Sets	4
228	**IIIA-20**	Local Instrument racks (LIR)	No.	120
229	**IIIA-21**	Local Instrument enclosures (LIE)	No.	70
230	**IIIA-22**	NETWORK PANELS (800x800x2100)	No.	7
231	**IIIA-23**	WALL MOUNTED NETWORK ENCLOSURES (500x600x600)	Sets	10
232	**IIIA-24**	Installtion of HART MANAGEMENT SYSTEM CABINET / HMI along with accessories PCs -79 nos, line matrix- 4 nos, colour laser- 10 nos, TFT Monitor- 79 nos etc for both units including furnitures (computer tables, printer tables, chairs)	Set	1
233	**IIIA-25**	Pulverizer screw conveyer monitoring system	Set	12
234	**IIIA-26**	Pulverizer 'Delta P' Panel (1600x550x2000, 1.5MT)	Set	12
235	**IIIA-27**	POWER DIST. PANEL CUM LINKS	SET	1
236	**IIIA-28**	Gr. Feeder Remote Control Panel (1400 x 2365 x 510), 636 kg	Set	14
237	**IIIA-29**	T & AVT PANEL	No.	2
238	**IIIA-30**	Electrical heat tracer panel and accessories	Set	3
239	**IIIA-31**	SUPERVISORY CONTROL PANELS	No.	6
240	**IIIA-32**	AC Control supply panel (ACCSP) consisting of transformers, changeover system, modules, etc. approx weight 3 MT	No	2
241	**IIIA-33**	DC Control supply panel (DCCSP) consisting of changeover system, modules, etc. approx weight 0.5 MT	No	2
242	**IIIA-34**	DC motor starter panels, etc (DC JOP, DC EOP, Seal oil panel, DC Scanner Air Fan Starter Panel), including resistance boxes. Approx weight 0.5 MT each.	No.	8
243	**IIIB**	**Local / Field mounted Instruments / Equipment**	-	-

244	**IIIB-1**	Electronic Water Level Indicator (EWLI) / EWLI, BHELVISION / Direct Water Level Gauge	Sets	14
245	**IIIB-2**	SWAS Sample handling system with racks & Sample conditioning panel with chiller (Both wet and dry)	Sets	4
246	**IIIB-3**	Analyzer Panel	No.	4
247	**IIIB-4**	Analyzer (HYDROGEN PURITY / oxygen / chloride /co2 / SO2 /NOX / pH / PHOSPHATE / SILICA / HYDRAZINE ETC.) / Conductivity Analyzer (Both panel mounted and field mounted)	No.	136
248	**IIIB-5**	Coal bunker level monitoring system, BUNKER LOAD CELL	Sets	4
249	**IIIB-6**	Master Slave Clock System	Sets	1
250	**IIIB-7**	EPABX System	Sets	1
251	**IIIB-8**	CCTV System	Sets	1
252	**IIIB-9**	Solenoid valves (3 way, AC/DC, 1/4", 1/2", 1", NPT/BSP, single/dual coil)	No.	250
253	**IIIB-10**	HEA Exciter system	Sets	32
254	**IIIB-11**	Flame Scanner Head Assembly (Fire ball and Discriminating Type)	No.	64
255	**IIIB-12**	Air filter regulators / Lubricators (1/2", 1", 0-6KG, 0-10 KG)	No.	152
256	**IIIB-13**	Speed Regulators / Air lock valves in oil gun corner rack	No.	24
257	**IIIB-14**	max Engineering / operator / storian / LAN / WAN /LVS Work Station/ Shift in charge / stn in charge / gateway / interface PC / HART etc., PC/Server Station with ASCII Keyboard, Mouse & 21" Colour Monitor, individual UPS in Modular CRT Desk with racks for HMI System	Sets	50
258	**IIIB-15**	Printers (80/132 col Dot Matrix, A3 Inkjet, A3 Laserjet, etc) with Printer table and accessories	Sets	32
259	**IIIB-16**	Laboratory Setup	Set	1
260	**IIIB-17**	Microphone including junction / control box and acessories for Mill DP level control	Sets	6
261	**IIIB-18**	Dust emission monitor (Installation at around 50 M in chimney)	Sets	2
262	**IIIB-19**	Flue gas analyser sample handling system	Set	2
263	**IIIB-20**	Console inserts (to be mounted on Backup desk)	Sets	2
264	**IIIB-21**	Vertical indicators (moving coil / bar graph)	No.	40
265	**IIIB-22**	Digital / bargraph indicators	No.	25
266	**IIIB-23**	Recorder 24 / 30 Channel	No.	6
267	**IIIB-24**	Recorder 3 channel	No.	6
268	**IIIB-25**	Speed switch / Speed detector	No.	6
269	**IIIB-26**	Moisture Sensor probe and dew point monitor	Set	2
270	**IIIB-27**	Rotor Earth fault Detector	No.	2
271	**IIIB-28**	Pressure Switch / DP Switch / DP indicating switch / PRESSURE GAUGE, 150 mm DIAL BOURDAN, DIAPHRAGM / DP GAUGE, 150 mm DIAL /DRAFT GAUGE, 150 mm DIAL	No.	463
272	**IIIB-29**	Temperature Switch/ Thermostat, DIRECT ACTING SWITCHES, TEMPERATURE SENSORS	No.	108
273	**IIIB-30**	Electronic Level Switch/ Electronic Level Transmitter (with amplifier, etc) of Capacitance or conductivity type	No.	36

274	**IIIB-31**	ERV CONTROLLER	No.	40
275	**IIIB-32**	Float type Level Switch, FLOW ELEMENTS/ Level Indicator/ Level Gauge, Flow indicator/ Flow Gauge/ Flow meter/ Acoustic flow meter (coal)/ Flow switch (Mechanical/ Electronic)/ Flow Transmitter (Pulse/ mass flow/ target type) including flanges	No.	598
276	**IIIB-33**	Temperature Gauge (all types), THERMOWELLS	No.	333
277	**IIIB-34**	Pressure / DP/ Flow (DP type)/ Level Transmitter displacer type/ Limit Switches on/off type with solenoid (checking and adjusting only)	No.	900
278	**IIIB-35**	Thermocouple/ RTDs with thermowell (all types) along with converters wherever applicable	No.	720
279	**IIIB-36**	MTM Thermocouple upto 17 M length	No.	120
280	**IIIB-37**	MTM Thermocouple over 17 M length	No.	140
281	**IIIB-38**	Thermocouple assy with 6/ 9 Cr-Al MI T/C along with integral JB	No.	4
282	**IIIB-39**	I/ P converters	No.	102
283	**IIIB-40**	Pneumatic Pressure controller with accessories	No.	2
284	**IIIB-41**	Pneumatic Temperature controller with accessories	No.	10
285	**IIIB-42**	SADC power cylinders	No.	120
286	**IIIB-43**	Rotameter	Sets	2
287	**IIIB-44**	Fan Lube oil skid	Sets	12
288	**IIIB-45**	Rack mounted instruments commissioning	Sets	6
289	**IIIB-46**	Coal Feeder local instruments commissioning	No.	12
290	**IIIB-47**	Electrical regulating drives: (Valve, damper, scoop)	No.	12
291	**IIIB-48**	Pneumatic regulating drives: (Valve, damper) incl SADC, Burner tilt	No.	140
292	**IIIB-49**	Commissioning of Hydraulic actuators	No.	30
293	**IIIB-50**	Corner valve/ Trip valves commissioning	No.	80
294	**IIIB-51**	Open/Close type pneumatic gates/ dampers/ valves	No.	100
295	**IIIB-52**	Only healthiness checking of embedded RTD/ T/C	No.	200
296	**IIIB-53**	Plant Control Desk/ CRT desk	Sets	2
297	**IIIB-54**	Computer furniture for all Servers, PCs, Printers	Sets	2
298	**IIIB-55**	EWLI CABLES, PTFE CABLE 10 pair x 0.6 sqmm	Mtr	80
299	**IIIB-56**	EWLI, SCREENED CABLE 16 pair x 0.5 sqmm	Mtr	600
300	**IIIB-57**	LEVEL TRANSMITTER, ULTRASONIC TYPE FOR LIGNITE AND LIMEPOWDER BUNKER/ SILOS	set	6
301	**IIIB-58**	LEVEL SWITCH for BED MATERIAL	No.	4
302	**IIIB-59**	LIQUID LEVEL SWITCH, OIL TANK (integral capacitance type	sets	4
303	**IIIB-60**	BUNKER LOAD CELL, LIGNITE/LIME STONE BUNKERS/SILOS	sets	4
304	**IIIB-61**	THERMOCOUPLE WITH THERMOWELL, K TYPE DUPLEX T/C	No.	47
305	**IIIB-62**	THERMOCOUPLE, K TYPE DUPLEX T/C (15/ 25M) MTM/ Combustor APPLICATION	No.	62
306	**IIIB-63**	FLOW ORIFICE ASSEMBLY, WELD IN TYPE FOR SH/RH SPRAY WATER, ORIFICE WITH FLANGES FOR SB flow and fed water flow	sets	4
307	**IIIB-64**	OIL FLOW METER, START UP BURNER & LANCES OIL FLOW	sets	4
308	**IIIB-65**	SEAL POT BLOWERS / CONDENSING POT, SOOT BLOWER STEAM FLOW APPLICATION ALONE IN OUR SCOPE	No.	5
309	**IIIB-66**	AIR ASSISTED SAFETY VALVE CONTROLLER, for main steam application	No.	1
310	**IIIB-67**	REGULATING POWER CYCLINDER, SA control, SA Start up burner DAMPERS/ OPEN CLOSE TYPE ELECTRICAL ACTUATOR, GATES & DAMPERS	No.	30
311	**IIIB-68**	UCB mounte instrument/ indicator / recorder	No.	200
312	**IIIB-69**	Commissioning of motorised actuators	No.	25

313	**IIIB-70**	Electronic earthing pit with electrode	No.	8
314	**IIIB-71**	Sensors / vibration pickups/ axial shift instruments	No.	50
315	**IIIB-72**	Calibration of SOV operated pneumatic trip valves	No.	40
316	**IIIB-73**	Calibration/ comissioning of regulating control valves with positioners/ PFT	No.	30
317	**IIIB-74**	UPS system consisting UPS 01 & UPS 02 with invertor, Bypass system, ACDB 01 & 02, UPS Battery	set	4
318	**IIIC**	**Impulse Pipe/ Tubing**		
319	**IIIC-1**	A 106 Gr C - 1" NB schedule 40	Mtr	600
320	**IIIC-2**	A 106 Gr C - 1/2" NB schedule 160	Mtr	1300
321	**IIIC-3**	A 106 Gr C - 1/2" NB schedule 80	Mtr	5000
322	**IIIC-4**	A335 P22 - 1/2" nb XXS	Mtr	900
323	**IIIC-5**	A213TP 316 - 1/2" NB schedule 40	Mtr	1800
324	**IIIC-6**	A213TP 316 - 1/2" NB schedule 160	Mtr	600
325	**IIIC-7**	Misc. types of Impulse Piping/ Tubing of different sizes (CS, AS, SS etc.)	Mtr	2000
326	**IIIC-31**	Copper tube- 6mm/8mm, 1/4", 1/2" to 1" (Sheathed / bare)	Mtr	1200
327	**IIIC-32**	Hoses- 1/2" to 1", SS/Teflon, Braided/unbraided, upto 5M length	No.	70
328		TUBING AND FITTINGS (CS, SS, AS)	MT	5
329	**IIID**	**MARSHALLING BOXES**		
330	**IIID-1**	Junction boxes upto 48 way	No.	400
331	**IIID-2**	Junction boxes above 48 way	No.	200
332	**IIID-3**	CJCB Junction boxes upto 48 way	No.	20
333	**IIID-4**	CJCB Junction boxes above 48 way	No.	50
334	**IIID-5**	2PB or 3PB Pushbutton box	No.	20
335	**IIID-6**	Assembly of JB mounting frames (approx 1100 x 500 x 800)	No.	6
336	**IIID-7**	Assembly of JB mounting frames (approx 1500 x 800 x 1800)	No.	2
337	**IIID-8**	Assembly of JB mounting frames (approx 2000 x 900 x 1800)	No.	18
338	**IIID-9**	Assembly of JB mounting frames (approx 2600 x 500 x 1800)	No.	6
339	**IIID-10**	Assembly of local gauge board 1400 x 450 x1900 mm	No.	6
340	**IIID-11**	FSSS Local Oil Gun Maintenance Switch Box	No.	24
341	**IIID-12**	WEATHER PROOF GI JUNCTION BOX, 32WAYS(20 nos) & 24WAYS (70 nos)	No.	90
342	**IIID-13**	Various Types of Local Push Buttons, Station JBs	No.	200
343	**GROUP IV**	**Installation of Electrical, C and I LAB items consisting of following tentative quantities and categories of instrumemts / equipments**	set	1
		Digital portable multimeter	No.	8
		Arbitrary function generator	No.	1
		High resolution timer/counter	No.	1
		Dual trace digital storage oscilloscope	No.	1
		Adjustable AC power supply	No.	1
		Digital tong tester	No.	1
		Single phase auto transformer	No.	1

		Decade resistance box	No.	1
		Portable wheat stone bridge	No.	1
		DC Battery charger	No.	2
		Digital portable vibration meter with accessories	No.	2
		Hand held digital oscilloscope	No.	1
		Pecision Multi-ohm meter	No.	2
		Digital Tachometer	No	1
		Digital Stop Watch	No.	1
		LCR Meter	No.	2
		DCS Commun. co-axial and optical cable/signal tester	No.	1
		Microprocessor based portable muli-function calibrator	No.	4
		Test equipment for speed and vibration	No.	1
		Co-axial crimping tools	No.	2
		Optical-fibre cable-jointer	No.	2
		Cable crimping tools and wire splicers	Set	5
		IC-remover of variou types	Set	4
		24V DC mobile -test-kit for solenoid valves	Set	2
		Test thermocouple	No.	2
		Test RTDs	No.	2
		Deadweight tester	No.	1
		Portable Pressure comparator	No.	1
		Manometer	Set	1
		Manometer (inclined)	No.	2
		Master pressure gauge	set	1
		Temperature calibration bath -Dry block	No.	1
		High precision regulators for pressure and vacuum	No.	2
		Precision thermometers (mercury in glasss)	set	1
		Digital infrared pyrometer	No.	1
		Portatble T/C calibrator	No.	4
		Vacuum pumps/compressors	No.	1
		Barometer	No.	1
		Sling Psychrometer	No.	1
		Laboratary furnace	No.	1
		Pnumatic test bench	No.	1
		Screw pump	No.	1
		Standard Tool Box	No.	5
		Radial Drilling Machine	No.	2
		Portable Drilling Machine	No.	2
		Poratble Flue gas analyser	No.	1
		Wet and Dry bulb standard thermometer	No.	1
		Poratable Wet and Dry bulb standard thermometer	No.	4
		Poratbl welding Machine	No.	1
		DP Gauges	No.	4
		Furniture for laboratory items for Electrical and Mechanical Lab items	Set	1
		TOTAL		

Annexure-V

CERTIFICATE OF DECLARATION FOR CONFIRMING THE KNOWLEDGE OF SITE CONDITIONS

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 condition.

Tenderer's Name and Address.

Place: (Signature of the Tenderer's With stamp)

Date:

Annexure-VI

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……..

Annexure-VII

GENERAL TERMS AND CONDITIONS OF REVERSE AUCTION (RA)

Against this NIT for the subject work, **tender shall be processed through Reverse Auction mode i.e., ON LINE BIDDING ON INTERNET. The General Terms and Conditions of the RA shall be as follows:**

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. BHEL will inform to the vendor in writing, in case of reverse auction along with the details of Service Provider to enable them to contact & get trained.
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 format (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".
7. Reverse auction will be conducted on scheduled 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. During Reverse Auction, if no bid is received within the specified time, BHEL at its discretion, may decide to revise opening price/ scrap the reverse auction process/ proceed with conventional mode of tendering.
11. **Sealed bid Reverse Auction:** The opening bid (In the initial auction) of the bidders shall be same as that quoted in their Final Sealed price submitted to BHEL. **The bidders shall confirm in writing to BHEL that their opening bid (In both cases) shall be same as that quoted in their final sealed price bids submitted to BHEL against this NIT along with Technical Bid (Part-I)**.
12. BHEL reserves the right to cancel Reverse Auction (RA) without assigning any reasons and resort to considering the sealed bids submitted by vendor for processing and finalizing the tender.
13. Any variation between the on-line bid value and the signed document will be considered as sabotaging the tender process and will invite disqualification of vendor to conduct business with BHEL as per prevailing procedure.
14. In case BHEL decides not to go for Reverse Auction procedure for this tender enquiry, the Price bids and price impacts, if any, already submitted and available with BHEL shall be opened as per BHEL's standard practice.
15. Bids-given by the bidders during the Reverse Auction process will be taken as an offer to execute the work. Bids once made by the bidder, cannot be cancelled/withdrawn and bidders shall be bound to execute the work as mentioned above at the final bid price. Should be bidder (Lowest) back out and not execute the contract as per the rates quoted, BHEL shall take action as appropriate.

Annexure - VIII

FORMAT FOR NO DEVIATION CERTIFICATE

(To be submitted in the bidder's letter head)

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 Work of erection, testing, commissioning, post commissioning, trial operations and handing over of all ELECTRICAL, CONTROL & INSTRUMENTATION equipments for 2 x 125 MW, Unit 1 & 2 at Barsingsar Thermal Power Project of Neyveli Lignite Corporation Ltd. at Barsingsar, Bikaner, Rajasthan.

TENDER NO. BHEL:NR:SCT:BSR:U 1 & 2:ECNI:503

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)