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

TENDER NO. BHEL:NR(SCT):OBRA(RM):BLR:450

FOR

"DISMANTLING OF SPECIFIED ITEMS UPTO BOILER OUTLET FLANGE, ROTARY PARTS , ERECTION/RE-ERECTION, OVERHAULING, TESTING, COMMISSIONING AND HANDING OVER OF BOILERS OF 3 X 200 MW UNITS # 9,10 &11 AT UPRVUNL OBRA 'B' TPS, OBRA (UP)"

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):OBRA(RM):BLR:450

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
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TENDER NOTICE

Sealed tenders are invited from the contractors fulfilling qualifying requirements for the work of **"DISMANTLING OF SPECIFIED ITEMS UPTO BOILER OUTLET FLANGE, ROTARY PARTS , ERECTION/RE-ERECTION, OVERHAULING, TESTING, COMMISSIONING AND HANDING OVER OF BOILERS OF 3 X 200 MW UNITS NO. 9,10 &11 AT UPRVUNL OBRA 'B' TPS, OBRA (UP)".**

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QUALIFYING REQUIREMENTS:

"Tenderers who wish to participate should fulfill following 'Qualifying Requirements";

1.1 "Should have executed during last Seven Years similar nature of work, covered in this tender i.e E/T/C of Boiler Pr. Parts for at least one unit of 60 MW Unit or higher rating units 'OR' R&M / Replacement works of boiler pressure parts (at least two sections out of LT/Platen/Final Superheaters, Reheater, Economiser, Water Walls and Boiler drum simultaneously in one boiler) for at least one unit of 60 MW Unit or higher rating units.

'OR'

"Should be executing (1) E/T/C works of Boiler Pr. Parts, as covered in this tender , against direct BHEL's order for a Boiler of 195 MW or above rating" 'OR' (2) "R&M / Replacement works of boiler pressure parts (at least two sections out of LT/Platen/Final Superheaters, Reheater, Economiser, Water Walls and Boiler drum simultaneously in one boiler) against direct BHEL's order for 195 MW Unit or higher rating units."

1.2 Party should also have an average annual turnover of minimum of Rs. 5 Crores (Rupees Five Crores Only) during preceding three years (2004-05, 2005-06 & 2006-07". The bidders shall submit audited balance sheets in support of this.

NOTES:

(i) The Tender Documents comprise of following;

(a) General Conditions of Contract(GCC), Special Conditions of Contract(SCC), Tender Notice, Project Synopsis, etc.—134 Pages
(b) Rate Schedule – 05 Pages

(ii) Tender Documents with complete details are hosted on BHEL's web page www.bhel.com. 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*** **17.11.2007**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 (Room No. 104) at the address given above **latest by 17.11.2007** before opening of technical bids commences. Technical bids shall **be opened at 15.30 Hrs. on 17.11.2007**. Tenders received after the due date & time shall be liable to be summarily rejected.

(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) Bids, once submitted, shall not be returned.

(xii) Purchase Preference will be given to CPSUs as per Govt. Guidelines.

Sr. DGM/SCP

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TENDER NOTICE- NEWSPAPER

LAST DATE OF SALE : 17.11.2007
DATE OF OPENING : 17.11.2007

NIT NO. / NAME OF WORK
TENDER NO. BHEL:NR(SCT):OBRA(RM):BLR:450 **Sealed tenders are invited from the contractors fulfilling qualifying requirements for the work of "DISMANTLING OF SPECIFIED ITEMS UPTO BOILER OUTLET FLANGE, ROTARY PARTS , ERECTION/RE-ERECTION, OVERHAULING, TESTING, COMMISSIONING AND HANDING OVER OF BOILERS OF 3 X 200 MW UNITS NO. 9,10 &11 AT UPRVUNL OBRA 'B' TPS, OBRA (UP)".**

NOTES:-

1. Purchase Preference will be given to CPSU as per Govt. Guidelines.
2. Please visit our website at www.bhel.com for complete details of the tender.
3. Bidder(s) can download complete tender documents from BHEL website. They can also purchase hard copy of tender documents from this office on payment of Rs.1,000/- (non-refundable) either in cash or by crossed demand draft in favour of BHEL, NOIDA.

Sr. DGM/SCP

Bharat Heavy Electricals Limited

(A Govt. Of India Undertaking)
Power Sector – Northren Region,
Plot No. 25 , Sector - 16A ,
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PROCEDURE FOR SUBMISSION OF SEALED TENDERS:

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

TECHNICAL BID (COVER-I)

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

PRICE BID (COVER-II)

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

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

PROJECT SYNOPSIS

1.	Name of the Owner	:	U.P. Rajya Vidyut Utpadan Nigam Ltd
2.	Address	:	Obra Thermal Power Station P.O. Obra Distt. Sonebhadra - 231219 Uttar Pradesh
3.	New Installation / Refurbishment	:	Obra 'B' (5 X 200MW) Refurbishment
4.	Nearest Railway station	:	Chopan – 15Km Approx. Mirzapur – 120Km Approx. Varanasi / Mugal Sarai – 125Km Approx.
5.	Nearest City	:	Roberstganj / Sonebhadra
6.	Nearest Airport	:	Varanasi – 150Km Approx.
7.	Maximum Tempreture	:	48 Deg C Approx.
8.	Minimum tempreture	:	Approx 2 Deg C Approx.

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 atonce 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 these 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 therefor 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 performa.

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 includes Deputy General Manager, Construction Manager, Resident Manager, Site Engineer, Resident Engineer and Assistant Site Engineer of BHEL at the site as well as the officers in charge at Head Office.

19.4 `**SITE**' shall mean the place or places at which the plants/ equipment are to be erected and services are to be performed as per the specifications of this Tender.

19.5 `**CLIENTS OF BHEL' or `CUSTOMER'** shall mean the project authorities to whom BHEL is supplying the equipment.

19.6 `**CONTRACTOR'** shall mean the individual, firm or company who enters into contract with BHEL and shall include their executors, administrators, successors and permitted assigns.

19.7 `**CONTRACT' or `CONTRACT DOCUMENT'** shall mean and include the agreement, the work order, the accepted appendices of rates, Schedules of Quantities, if any, General Conditions of Contract, Special Conditions of Contract, Instructions to Tenderers, the drawings, the technical specifications, the special specifications, if any, the tender documents and the Letter of Intent/ Acceptance letter issued by BHEL. Any conditions or terms stipulated by the tenderer in the tender documents or subsequent letters shall not form part of the Contract unless specifically accepted in writing by BHEL in the Letter of Intent and incorporated in the Agreement.

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

19.9 `**TENDER SPECIFICATIONS'** shall mean the Special Conditions, Technical Specifications, appendices, Site information and drawings pertaining to the work for which the tenderers are required to submit their offer. Individual Specifications Number will be assigned to each tender specifications.

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 effecting the recoveries due from the contractor.

24.5 All recoveries due from the contractor for the month / period shall be effected 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 remeasurement 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 anybody 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 can not 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/ requalification 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 the contractor on payment of hire charges as fixed by them , subject to the 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 effecting 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 it's 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, it's distribution and use shall conform to the requirements of Indian Electricity Act and Rules. Only electricians licensed by the appropriate statutory authority shall be employed by the contractor to carry out

all types of electrical works. All electrical appliances including portable electric tools used by contractor shall have safe plugging system to source of power and be appropriately earthed.

27.5 The contractor shall not use any hand lamp energised by electric power with supply voltage of more than 24 volts. For work in confined spaces, lighting shall be arranged with power source of not more than 24 volts.

27.6 Where it becomes necessary to provide and / or store petroleum products, explosives, chemicals and liquid or gaseous fuel or any other substance that may cause fire or explosion, the contractor shall be responsible for carrying out such provision and/or storage in accordance with the rules and regulations laid down in the relevant Government Acts, such as Petroleum Act, Explosives Act, petroleum and Carbides of Calcium Manual of the Chief Controller of Explosives, Government of India etc. Prior approval of the authorised BHEL official at the site shall also be taken by the contractor in all such matters.

27.7 The contractor shall arrange at his cost (wherever not specified) appropriate illumination at all work spots for safe working, when natural daylight may not be adequate for clear visibility.

27.8 In case of a fatal or disabling injury / accident to any person at construction sites due to lapses by the contractor, the victim and / or his / her dependents shall be compensated by the contractor as per statutory requirements. However, if considered necessary, BHEL shall have the right to impose appropriate financial penalty on the contractor and recover the same from payments due to the contractor for suitably compensating the victim and / or his / her dependents. Before imposing any such penalty, appropriate enquiry shall be held by BHEL giving opportunity to the contractor to present his case.

27.9 In case of any damage to property due to lapses by the contractor, BHEL shall have the right to recover the cost of such damages from the payments due to the contractor after holding an appropriate enquiry.

27.10 In case of any delay in the completion of a job due to mishaps attributable to lapses by the contractor, BHEL shall have the right to recover cost of such delay from the payments due to the contractor, after notifying the contractor suitably and giving him opportunity to present his case.

27.11 If the contractor fails to improve the standards of safety in its operation to the satisfaction of BHEL after being given reasonable opportunity to do so and / or if the contractor fails to take appropriate safety precautions or to provide necessary safety devices and equipment or to carry out instructions regarding safety issued by the authorized BHEL official, BHEL shall have the right to take the corrective steps at the risk and cost of the contractor after giving a notice of not less than seven days indicating the steps that would be taken by BHEL.

27.12 The contractor shall submit report of all accidents, fires, property damage and dangerous occurrences to the authorized BHEL official immediately after such occurrence, but in any case not later than 12 hours of the occurrence. Such reports shall be furnished in the manner prescribed by BHEL. In addition, periodic reports on safety shall also be submitted by contractor to the authorized BHEL official from time to time as prescribed.

27.13 During the course of construction, alteration or repairs scrap 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 Super-visors deployed at peak	No. of Engrs. & workers 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) lst	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 perAnnexure-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 - 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 Octroi, Terminal and other taxes including sales tax or other duties on material obtained for execution of the said works shall be borne and paid by the Contractor.

12. That BHEL shall be entitled to deduct from the Contractor's running bills or otherwise Income Tax under Section 194 (C) of the Income Tax Act, 1961.

13. That BHEL shall be further entitled to recover from the running bills of the Contractor or otherwise such sum as may be determined by BHEL from time to time in respect of consumables supplied by BHEL, hire charges for tools and plants issued (Where applicable) and any other dues owed by the Contractor.

14. That it is hereby agreed by and between the parties that non- exercise, forbearance or omission of any of the powers conferred on BHEL and /or any of its authorities will not in any manner constitute waiver of the conditions hereto contained in these presents and the liability of the Contractor with respect to compensation payable to BHEL or Contractor's obligations shall remain unaffected.

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

16. The following documents

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

shall also form part of and govern this Agreement.

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

WITNESS

1.

2.

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

WITNESS

1.

2.

(For and on behalf of BHEL)

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 – 110049 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 – 110001.

2. Canara Bank
   74, Janpath,
   New Delhi – 110001.

3. Punjab National Bank,
   74, Janpath,
   New Delhi – 110001.

4. Bank of Baroda,
   Corporate Banking Branch,
   11th Floor, BOB Building,
   Sansad Marg,
   New Delhi – 110001.

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,
   8, Ramanashree Arcade,
   M.G. Road, Bangaloe – 560001.

8. State Bank of Travancore,
   Travancore House, IF Branch,
   K.G. Marg, New Delhi – 110001.

9. Deutsche Bank,
   Tolstoy Marg,
   New Delhi – 110001.

9. HDFC Bank Ltd.,
   5th Floor, HT House,
   K.G. Marg,
   New Delhi – 110001.

10. Citi Bank N A
    Jeevan Vihar Building,
    Sansad Marg,
    New Delhi – 110001.

11. Standard Chartered Bank,
    H2 Block, Connaught Place,
    New Delhi – 110001.

12. ICICI Bank Ltd.,
    ICICI Tower,
    Bisham Pitamah Marg,
    Pragati Vihar,
    New Delhi – 110003.

13. IDBI Bank Ltd.,
    19, K.G. Marg,
    Surya Kiran Building,
    New Delhi.

14. HSBC Ltd.,
    ECE House,
    28 KG Marg,
    New Delhi – 110001.

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

4.1.1 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-Incharge 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	PERFORMING FUNCTIONS CONFORMANCE				AUDIT FUNCTION CUSTOMER REVIEW AUDIT REQUIREMENT
				PERFORMER	CHECKER	APPROVER	

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: Shelds				
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				
Availbility 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

SECTION - III `A'

SPECIAL CONDITIONS OF CONTRACT

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SECTION - III `A'

SPECIAL CONDITIONS OF CONTRACT

34.0 GENERAL

The work under these specifications broadly comprises of the following for **units 9,10 & 11** of 200 MW rating Boilers of UPRVUNL AT OBRA 'B' TPS DISTT. SONEBADRA (UP)

- Collection/Receipt, Transportation, Erection, testing and commissioning of boilers and its auxiliaries like rotating machines, flue gas ducting etc.

- The work to be carried out under the scope of these specifications is broadly as under:

1) Dismantling of specified items, re erection after servicing / repairs and transportation of unused items to the specified areas.
2) Collection/Receipt and transportation of materials, and positioning on ground before erection.
3) Pre-assembly, if any, pre-erection checks as applicable.
4) Overhauling/Erection, alignment and welding, bolting, fastening , grouting as applicable of:
    b) Boiler supporting structures
    c) Boiler pressure parts
    d) Boiler trim & integral piping
    e) Non-pressure parts including flue gas ducting, dampers, gate etc. with their drive.
    f) Rotating machines including milling system with drives.
    g) Pulverized fuel piping
    h) Other external structures
    i) Handling arrangements for rotating machines
5) Non-destructive examination & post weld heat treatment.
6) Application of Insulation.
7) Complete painting.
8) Pre-commissioning checks / tests, trial runs / testing and commissioning.
9) Trial operation and handing over of the units (including assistance in PG test).

SCOPE OF WORK IS FURTHER DETAILED IN VARIOUS CLAUSES HEREAFTER.

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

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 erection. If any portion of work is found to be defective in workmanship, not conforming to drawings or other stipulations, the contractor shall dismantle and redo the work duly replacing the defective materials at his cost. Failing which the job will be carried out by BHEL by engaging other agencies/ departmentally and recoveries will be affected from contractor's bills towards expenditure incurred including BHEL's usual overhead charges.

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

b Proper out-turn as per BHEL plan and commitment.

c Completion of work as per BHEL Schedule.

d Good quality and accurate workmanship for proper performance of the equipment.

e Repair and rectification.

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

34.5 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)..

34.6 In order to meet the environmental concerns it is expected that the contractor shall plant, protect and maintain at least **50 trees** or equivalent in the vicinity of the project as per the available space and as per the advise of Engineers.

35.0 CIVIL WORKS, FOUNDATIONS AND GROUTING.

35.1 UPRVUNL/ BHEL shall provide foundations for all the equipment and columns and civil works. The contractor for their scope shall check the dimensions of the foundations, locations of pockets, pitch of anchor bolts and other inserts as per drawings. Further, top elevation of foundations shall be checked with respect to benchmark etc. 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 be aligned and fixed on the foundations using approved quality special high strength, non-shrinking and quick-setting grouts. The minimum thickness below the packer plate should be 20 mm. The material required for this has to be arranged for by the contractor at his cost.

35.4 Complete grouting of structures, equipments, including anchor / foundation bolts, beneath base, base hollows etc. as may be applicable, is included in the scope of contractor. Arranging all labour, building materials including cement, ordinary Portland as well as quick setting – free flow – non-shrink grout mix (e.g.srinkcomp , conbextra etc), form work, shuttering, and any other requirements is in the contractor's scope. Contractor shall obtain approval of BHEL for cement (ordinary as well as quick setting – free flow – non-shrink grout mix) prior to use. Cleaning of foundation surfaces, pocket holes and anchor bolt pits and de-watering and making them free of oil, grease, sand and other foreign materials by soda washing, water washing, compressed air and other approved methods, are within the scope of this specification / work.

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

35.5 The contractor shall check and verify the alignment of equipment, alignment of shafts of rotating machinery, the slopes of all bearing pedestals, centering of rotors with respect to their sealing bores, couplings etc. as applicable and the like items to ensure that no displacement had taken place during grouting. The values recorded prior to grouting shall be used during post grouting check up and verifications. Such pre and post grout records of alignment details shall be maintained by the contractor in a manner acceptable to the Engineer.

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 and any other temporary supports shall also be the contractor's responsibility. For these civil works, all materials including cement and required facilities shall have to be arranged by contractor at his own cost.

36.0 CONSUMABLES

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

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

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

36.4 Only TIG filler wire and welding electrodes for T/P 91 materials, if applicable, shall be supplied by BHEL mfg. Units free of cost. if any other special filler wires are supplied by the manufacturing unit as a normal supplies shall also be issued free of charge for erection. Required quantity as arrived at by calculation / standards will only be supplied. It would be the contractors' responsibility to account for the consumption of these filler wires. Additional requirement beyond standard / calculated quantity will be arranged by contractor. BHEL supplies will be at cost recovery basis only unless and otherwise accounted for. Surplus quantity of TIG filler wire, if any, shall be properly stored and returned to BHEL stores. **The contractor has to take care of above in their offer.**

36.5 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. 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 number, date of expiry etc and produce test certificate for each lot / batch with correlation of batch / lot number with respective test certificate. No electrode without a valid test certificate will to be used.

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

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

36.8 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.

36.9 All lubricants and chemicals required for cleaning, pre-commissioning, commissioning, testing, preservation and lubricants for trial runs of the equipment shall be supplied by BHEL / BHEL's client. All services including labour and T&P 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 BHEL/ CUSTOMER stores at no extra cost to BHEL. Recoveries shall be affected for wastage by the contractor.

36.10 Transportation of oil drums, from stores, filling of oil and filling of oil for flushing, first filling of oil and subsequent changeover or topping / making up till the unit is fully commissioned and handed over to customer is included in scope of this contract. The contractor shall have to return all the empty drums to BHEL / BHEL's client store at no extra cost. Any loss / damage to above drums shall be to contractor's account.

36.11 All charges on account of Octroi, terminal or sales tax and other duties on materials obtained for the works from any source shall be borne by the contractor.

37.0 TOOLS AND PLANTS / IMTE's

37.1 T&P / IMTE's being provided by BHEL, **as per Annexure-II**, to sub-contractor free of hire charges shall be shared by other subcontractors working for BHEL at site and the allotment done by BHEL Engineer shall be final and binding.

37.2 Besides the T&P 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. Indicative lists of T&Ps and IMTEs to be arranged by the contractor are given **as per Annexure-III.** He should ensure that these are in good 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 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, wire ropes, hoses, pipes 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&P being provided free of hire charges shall be in the scope of the contractor. The contractor shall arrange, at his own cost, trained operators, fuel and other consumables for their operation. **(Operators, fuel and other consumable for BHEL/UPRVUNL's 100/150/300 MT & Hydra/Mobile cranes along with helpers shall be provided by contractor within the final accepted rates).** All lubricants for these cranes such as mobil oil, gear oil, brake oil, hydraulic oil, torque converter oil and grease will be provided by BHEL free of cost. The contractor will give the requirement well in advance. For other cranes of lower capacity the contractor shall arrange, at his own cost, trained operators, fuel and other consumables for their operation.

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

37.7 The day to day maintenance of BHEL's T&Ps shall 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. These shall be made available for Inspection whenever required. In case of any lapses on the part of the contractor BHEL at its own discretion get the servicing / repair of equipment done at the risk and cost of the contractor with BHEL overheads.

The contractor at his own cost shall arrange all supervision and labour required for maintenance of cranes. For attending breakdowns, the contractor shall arrange for labour. Minimum one mechanic and two helpers shall be exclusively marked for the above work. However specialist's supervision, if required, for attending breakdowns shall be arranged by BHEL as assessed by BHEL Engineer

37.7 The contractor shall arrange at his cost all spares needed for upkeep of all T&Ps other than Cranes and Hydraulic Test Pumps supplied by BHEL. 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 recovered from contractor's RA bills.

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

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

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

37.12 The contractor has to maintain a logbook and shall furnish regular maintenance and utilization report of the BHEL T & P's under his possession, as per requirement of BHEL.

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 from stores or place of use by other contractor at project site, transport the same to site and return the same to BHEL store / place as intimated by Engineer in project site in good working conditions after use.

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 workload). If contractor delays return of T&P and IMTE, hire charges as applicable shall be levied by BHEL from time, it was requisitioned till the time of actual return.

T&Ps and IMTEs returned in damaged / unserviceable condition shall be got repaired by BHEL at its own discretion and entire cost of repair with BHEL overheads shall be recovered from the contractor.

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 / final bills

37.17 All tools and tackles, machinery, equipment, instruments required for the work have to be arranged by the contractor including its transportation before and after work and including storage, insurance etc.

37.18 The contractor shall provide all required tools and plants, inspection, measuring and test equipment and handling & transportation equipment for the scope of work covered under these specifications. Some of the major T & Ps to be necessarily provided by the contractor is listed in appendix- III. BHEL will provide the services of their T & Ps listed vide appendix-II, free of charge, on sharing basis.

37.19 All tools and tackles to be deployed by the contractor for the work shall have the prior approval of BHEL engineer with regard to brand, quality and specification.

37.20 Contractor shall provide all the necessary scaffolding materials, temporary structures, as may be required and necessary safety devices etc.

37.21 Contractor's responsibilities with regard to operator, fuel, lubricants and daily upkeep of T & P s provided by BHEL is further detailed in relevant section.

37.22 Timely deployment of adequate quantity of T & P is the responsibility of the contractor. The contractor shall be prepared to augment the T & P at short notice to match the planned program and to achieve the milestones.

37.23 Contractor shall maintain and operate his tools and plants in such a way that major breakdowns are avoided. In the event of major breakdown, contractor shall make alternative arrangements expeditiously so that the progress of work is not hampered.

37.24 The T & P to be arranged by the contractor shall be in proper working condition and their operation shall not lead to unsafe condition. The movements of cranes, and other equipment should be such that no damage / breakage occurs to foundations, other equipments, material, property and men. All arrangements for the movement of the T & P etc., shall be the contractor's responsibility.

The contractor shall arrange adequate nos. of wooden sleepers for compaction of approach for crane movement and material stacking near work site failing which BHEL may get the same done at their risk & cost.

37.25 The contractor at his cost shall carry out periodical testing of his construction equipments and calibration of measuring instruments (MMDs) and tests. Test/ calibration certificates shall be furnished to BHEL. MMDs shall be calibrated only at accredited laboratory as per the list available with BHEL or any other laboratory approved by BHEL.

37.26 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. Fitness certificate of T&P shall have to be submitted before it is put in use. Identification for such T&Ps will be done as per BHEL Engineer's advice.

37.27 Contractor shall ensure deployment of reliable and calibrated IMTEs (Inspection measuring and testing equipment). The IMTEs shall have test / calibration certificates from authorized / Government 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.

37.28 Re-testing / re-calibration shall also be arranged at regular intervals during the period of use as advised by BHEL Engineer within the contract price. The contractor will also have alternate arrangements for such IMTE so that work does not suffer when the particular instrument is sent for calibration. If any IMTEs not found fit for use, BHEL shall have the right to stop the use of such item. It will be necessary for the contractor to deploy proper item. Any readings taken by the defective instrument will be recalled and repeat the readings taken by that instrument with a proper one. In case he fails to do so, BHEL may deploy IMTEs and retake the readings at contractor's cost.

37.29 BHEL shall have lien on all T&P, IMTEs and 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 / extended period. The contractor and / or his sub-contractors, without the prior written approval of the Engineer, shall remove no material brought to the site.

37.30 The **month wise T&P deployment plan** to be submitted as per format (at **Annexure-D** to general conditions of contract) is only to assess the capability as well as understanding of the contractor to execute the work. It shall be the contractor's responsibility to deploy the required T&P, for timely and successful completion of the job, to any extent over and above those indicated in the above deployment plan (including those which are not covered in the plan submitted) without any compensation on this account.

37.31 One SKY CLIMBER/MAINTENANCE PLATFORM for boiler will be provided to the erection agency. The total erection including dismantling, commissioning, maintenance, statutory clearances shall be in the scope of erection agency at no extra cost to BHEL. All day to day and routine maintenance and checking of the lift is to be carried out by the contractor as per the recommendations of the supplier. He should periodically check to ensure the safety for all those using the hoist.

The hoist should never be overloaded as this can lead to serious accidents. Ensuring all safety aspects in operation of lift shall be responsibility of contractor. All the landing platforms are to be erected by him. They are to be provided with proper barricades and hand railings. No separate payment for the temporary jobs will be made. The contractor will have to dismantle such temporary works and return the material to the stores.

38.0 SUPERVISORY STAFF AND WORKMEN

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

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

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. They should in general see and ensure that the works are carried out in a safe and proper manner and in coordination with other labour and staff deployed directly by BHEL or other contractors of BHEL or BHEL's client / other agency.

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

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 conforms 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 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.

38.7 During the course of erection,

- If the progress is found unsatisfactory,
- If the target dates fixed from time to time for every mile stones are to be advanced / not being met,
- If it is found that the skilled workmen like fitters, operators, technicians etc deployed are not sufficient,

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

38.8 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 / telephone poles, wire, trees or any other property or to any part of erected components, the contractor shall make the same good at his own expense. In default, BHEL may cause the same to be made good by other workmen or by other means and deduct the expenses from any money due to the contractor. BHEL's decision will be final and binding.

38.9 Though every endeavor shall be made to ensure that all plant materials are supplied as per schedule. However in a job of this kind it is possible that some materials may be delayed. In order to achieve the ultimate targets, the contractor may have to augment his manpower and resources. No compensation on this account shall be admissible.

38.10 The **month wise manpower deployment plan** to be submitted as per format (at **Annexure-C** to General Conditions of Contract) is only to assess the capability as well as understanding of the contractor to execute the work. It shall be the contractor's responsibility to deploy the required manpower, for timely and successful completion of the job, to any extent over and above those indicated in the above deployment plan (including those which are not covered in the plan submitted) without any compensation on this account. The contractor shall identify separate persons at site for quality control and safety.

39.0 MATERIAL HANDLING AND STORAGE FOR ETC/OVERHAULING

39.1 All the equipment furnished under this contract shall be collected/received from the project stores, sheds / storage yards and transported to pre assembly area / erection site and stored in the storage spaces in a manner so that they are easily retrievable till the contractor erects them. **No claim is admissible on this account**

39.2 While BHEL will endeavor to store / stack / identify materials properly in their open / close / semi closed / tarpaulins covered storage yard / shed, it shall be contractor's responsibility to assist BHEL in identifying materials well in time for erection. They should take the delivery of the same, following the procedure indicated by BHEL, and transport the material safely to pre-assembly yard / erection site in time, according to program.

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. Dragging of piping / valves should be avoided. 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.

39.8 Contractor shall be responsible for examining all the plant and materials issued to him and notify the Engineer immediately of any damage, shortage, discrepancy etc before they are moved out of the stores / storage area. The contractor shall be solely responsible for any shortages or damages in transit, handling, storage and erection of the equipment once received by him. As the erection work will be spread in different areas / locations of the project, contractor has to arrange sufficient number of watch / ward personal to avoid any pilferage of material. As per General Conditions of contract under provisions of clause No 29 BHEL will reserve the right to recover the cost of repair / replacement, if any, to bring back the equipment in original order, in case the equipment / material is lost / damaged while in the custody of the contractor. BHEL's decision in this regard shall be final and binding on the contractor.

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 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.

39.12 The contractor shall be responsible for making suitable indoor storage facilities to store all equipment (drawn by the contractor from BHEL / customer stores), which require indoor storage till the time of their installation. The Engineer will direct the contractor in this regard, which item in his opinion will require indoor storage, and the contractor shall comply with Engineer's decision.

39.13 The contractor shall ensure that all surplus / damaged / scrap / unused material, packing wood / containers/ special transporting frames etc are returned to BHEL at a place in project area identified by the Engineer. The contractor will maintain an account for all items received and returned to BHEL. Any shortage in returning such items shall be chargeable to the contractor except for a 5% allowable against wastage for packing wood only.

39.14 The contractor shall hand over all parts / materials remaining extra over the normal requirement with proper identification tags to the stores as directed by the concerned BHEL engineer.

39.15 The contractor shall ensure that all the packing materials and protective devices installed on equipment during transit and storage are removed before installation.

39.16 t shall be the responsibility of the contractor to keep the work / storage areas in neat, tidy and working conditions. All surplus/unusable packing and other materials shall be removed and deposited at location(s) specified by BHEL within the project premises. If required weighing of the same within the project premises will have to be carried out.

40.0 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 blocked up at least six inches (6") off the ground

Motors, valves, electrical equipment, control equipment and instruments etc shall be stored indoors in a 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.

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

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, primers, 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 ERECTION/OVERHAULING

41.1 All normal erection and assembly techniques necessary for completion of works under this specification and magnitude have to be carried out. It is not possible to specifically list out all of them. Absence of any specific reference will not absolve the contractor of his responsibility for the particular operation. These would include,

- Scaffolding and rigging operations,
- Machine / flame / electric cutting, grinding, welding, radiography and stress relieving
- Fitting, fettling, filing, straightening, chamfering chipping, scrapping, reaming, as cleaning, checking, leveling, blue matching, aligning and assembly.
- Machining, surface grinding, drilling, doweling, shaping
- Temporary erections for alignment, dismantling of certain equipment for checking, cleaning, servicing and site fabrication.
- Insulation and painting

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

41.3 No members of any ladder / structure / platform should be cut without specific approval of BHEL. In case it is necessary to cut, the contractor shall rectify / repair in a manner acceptable to BHEL / customer without any additional cost.

41.4 The contractor shall erect scaffolding / temporary platforms for erection. These should be of adequate capacity and shall never be over loaded. These should be replaced when not found suitable during erection work and dismantled on work completion and removed from work site.

41.5 It shall be the responsibility of the contractor to provide ladders on columns for initial work till such time stairways are completed. For this, the ladder should not be welded on the column and should be pre-fabricated clamping type ladders. No temporary welding on any structural member is permitted except under special circumstances with the approval of BHEL. In case it is absolutely necessary then the contractor shall cut the temporary structure and rectify the column as directed by the engineer.

41.6 The contractor is strictly prohibited in using the Boiler / ESP / Auxiliary Components for any temporary supporting or scaffolding works etc. In case of such misuse, a sum as determined by Engineer will be recovered from contractor's bills.

41.7 Boiler auxiliary columns are plate formed box section and the erection joint is welded type where as the columns are butt type with HSFG bolted flange and partition plates, boiler main column are having flange with splice plates and bolted connections. However, the contractor has to carry out work at site as per drawing.

41.8 Some material for platform section weight under PG-36 shall be supplied in running meters. These shall be cut to size / shape / fabricated to required size / shape and to be welded by contractor.

41.9 Certain adjustment in length may be necessary while erecting pipelines / ducts / casings etc. The contractor should remove the extra lengths / add extra lengths to suit the final layout after preparing edges afresh by adopting specified heat treatment procedures.

41.10 Economizer, super-heaters, re-heater coils, burner panels may have to be hydraulically tested individually, if required, before erection as instructed by BHEL Engineer within finally accepted rates.

41.11 Suspensions for ducting will be supplied in running lengths, which shall be cut to size and adjusted as required. Ducts / expansion bellows are dispatched to site in loose walls plates / pieces and these are to be assembled and welded at site along with stiffeners etc., before erection within the finally accepted rates. All joints connecting duct expansion piece and dampers shall be seal welded on inside as well as on outside.

41.12 Assistance in mechanical work associated with the power cylinders, valves, valve actuators etc., coming under various groups shall be provided by contractor within the finally accepted rates.

41.13 Hanger rods are shown in the pressure parts arrangement drawings for boiler. Any cutting / welding of these hangers rods will be done by the contractor. The hangers for pressure parts will be tested for even distribution of load with the help of a torque wrench.

41.14 The headers are provided with hand holes. The contractor, shall as per requirement, carry out removal and re-fixing of hand hole plates within finally accepted rates.

41.15 Burner tilt mechanism will be checked for freeness, serviced and adjusted, if necessary to obtain optimum tilt before installation.

41.16 Skin casing sheet for covering the boiler roof panels, rear arch tube and other areas will be supplied by BHEL. Any cutting, addition and re-fabrication to suit the site conditions shall be carried out within the finally accepted rates.

41.17 NOT APPLICABLE

41.18 The contractor shall carry out trial run of all motors including checking the direction of rotation in the uncoupled condition. Checking of alignment and re-coupling of the motor to the driven equipment as per instructions of BHEL engineer and to their satisfaction.

41.19 The contractor shall fabricate pipe, special bends etc., threading and welding as required for installing lube oil system and carry out the acid cleaning of the fabricated piping. The contractor shall also service the lube oil system, carrying out the hydraulic test of oil coolers etc.

41.20 Contractor shall carry out kerosene testing of all bearing housings of various rotating equipment like pumps, fans etc., as per BHEL engineer's instructions. Performance of hydro test of oil coolers of rotating machines and hydro test of SCAPH and other equipment as per BHEL engineer's instructions is included in the scope of work.

41.21 Forced lube oil system of motors or rotating equipment form parts of the work under this specification.

41.22 Certain rotating machinery after initial runs and commissioning of the equipment have to be hot aligned as per the instructions of BHEL engineer. Cleaning air pre-heater, fans, boiler ducting etc., free of extraneous steel, scaffolding materials electrodes, all foreign materials etc., before trial run of rotating machinery, and at various stages of pre-commissioning activities as per BHEL engineer's instruction, is within the scope of work.

41.23 Some of the rotating equipment and electrical motors are provided with protective greases only. Contractor shall arrange for cleaning of the same with kerosene or some other reagent. If necessary, dismantling some of the parts of the equipment would be necessary. He shall arrange for re-greasing / lubricating them with recommended lubricants and for assembling back the dismantled parts, at quoted rate. Lubricants will, however, be supplied free of cost by BHEL.

41.24 After initial trial of rotating equipment, control and power cabling for motors and other equipment / instrumentation shall have to be disconnected for checking alignment and re-setting / re-alignment / hot alignment. Contractor shall have to arrange for disconnecting control and power cabling as per BHEL engineer's instructions and clearance and reconnect the control and power cabling after realignment. Quoted tonnage rate shall be inclusive of the above.

41.25 Packer plates supplied may have to be machined to the correct dimensions. It may also be necessary to blue match the same with each other/ with equipment / with foundations as per BHEL instructions.

41.26 Contractor shall arrange changing of preservative oil in the gearboxes, journal and other bearing assemblies of rotating equipment when in storage areas or after erection of equipment as the case may be as per the instructions of BHEL engineer. Necessary lubricants / oil will be supplied by BHEL and the same will be drawn by contractor from BHEL / customer's stores and transporting to site. **No additional payment will be made for such works** even though supply of lube oil might have been made under regular dispatch-able unit (DU) number against product group main assembly (PGMA) and appearing in the shipping list. Prior to the commissioning of the equipment, oil should be drained and collected in drums provided by BHEL and returned to BHEL / customer's stores.

41.27 The air-preheater rotor may be disturbed during the initial operation. This may change the original clearances. It requires rechecking and correction of seal clearances. Contractor shall carry out such checks and resetting of clearances as per the instructions of BHEL engineer. The resetting may have to be repeated till satisfactory results are obtained.

41.28 Checking of air gaps and adjustment of stator / rotor for magnetic center of HT motors shall be carried out as part of erection.

41.29 The fans, mills and other rotating machines shall be checked for clearances and other vital tolerances. The IGV unit shall be serviced. Necessary assistance for balancing of equipment during trial run, if required, shall be provided by the contractor free of cost.

41.30 Complete penetration of water wall (Panel to Panel) welding shall be achieved either by one side or both sides welding.

41.31 Whenever required the contractor shall arrange for pre-qualification of process task performers.

41.32 All attachments welding including those for insulation works coming on pressure parts / non-pressure parts which the contractor has erected shall be done by IBR / BHEL tested welders only.

41.33 All electrical cabling including proper glanding, termination, dressing etc., control and instrumentation works required for completion of works covered under scope of this tender including commissioning shall be part of this work. This will include erection of all electrical equipments such as control panel, laying of trays and cables and other associated equipment.

41.34 All rotating machines and equipment shall be cleaned, lubricated, checked for their smooth rotation, if necessary by dismantling and refitting before erection. If, in the opinion of Engineer, the equipment is to be checked for clearance, tolerance at any stage of work or during commissioning period, all such works are to be carried out by contractor at his cost.

41.35 All the shafts of rotating equipment shall be properly aligned to those of the matching equipment within design tolerances All bearings; shafts and other rotating parts shall be thoroughly cleaned and suitably lubricated before starting.

41.36 All the motors and equipment shall be suitably doweled after alignment of shafts with taper / parallel machined dowels as per the direction of the Engineer. Dowel pins required are be machined by the contractor at his own cost. However the materials for dowel pins shall be issued by BHEL free of cost.

41.37 The HT motor bearings shall be blue matched at site and checked for bearing clearances. The contractor if required shall carry out scraping of bearing housing. No extra claim for blue matching up to 1mm initial gap will be entertained.

41.38 The contractor at no extra cost to BHEL shall carry out servicing and realignment of skid mounted equipment.

41.39 Certain instruments like pressure gauges, pressure transmitters, temperature gauges, flow switches and indicators, etc., are received in assembled condition as integral part of equipment. Contractor shall be responsible for safe receipt, installation and custody of these instruments supplied mounted on skids / equipment. The calibration of skid / equipment mounted instruments shall be arranged by BHEL through other agency engaged for C&I. Contractor will be informed by BHEL engineer about the details of C&I agency. The contractor shall coordinate with the C&I agency for removal, calibration and re-installation of the instruments. Though C&I agency will remove and reinstall the instruments after calibration, the contractor for this package will maintain the list of all the instruments removed & reinstalled. Instruments prior to removal and after reinstallation shall be considered in custody of the contractor for this package. All instruments such as pressure gauges / temperature gauges, switches etc. forming part of product group (PG) are under the erection scope of this contract and shall be installed and commissioned by the contractor of this package at no extra cost to BHEL. However the calibration of these instruments shall be done by C&I agency as above

41.40 All electrical panels, control gears, motors and such other devices shall be properly dried by heating to improve IR valve, before they are energized. Bearings, slip rings commutators and other exposed parts shall be protected against moisture ingress and corrosion during storage and periodically inspected.

41.41 The contractor shall completely erect and test all the piping systems, covered in the specification including sampling lines up to and including sample coolers, hangers & supports, valves and accessories in accordance with the drawings furnished. This includes all necessary bolting, welding, pre-heating, stress relieving, testing, cleaning and painting. System shall be demonstrated in condition to operate continuously in a manner acceptable to the Engineer. Welding shall be used throughout for joining pipes except where flanged, screwed or other type joints are specified or sown on the drawings. All piping shall be erected true to the lines and elevation as indicated in the drawings.

41.42 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 65-mm nominal bore will have to be fabricated at site. Only cold cutting methods are to be employed for cutting of pipes and tubes irrespective of the size and material. Gas Cutting, if any, will be allowed only in CS LP piping

41.43 The contractor shall ensure lowering of pipes in position with adequate precautions as to avoid any damage to either material or men. Only the anchoring points earmarked for the purpose of lowering the pipes are to be used.

41.44 It is possible that a few flanges may not be matching. The contractor shall be required to cut and re-weld the same as and when required without any additional cost.

41.45 Wherever piping erected by the contractor is connected to equipment / piping erected by the other agencies, the joint at the connecting point shall be the responsibility of the contractor who is erecting the piping under this specifications.

41.46 Normally the high-pressure valves will have prepared edges for welding. But, if it becomes necessary, the contractor will prepare new edges or recondition the edges by grinding or chamfering to match the corresponding tubes and pipes within the scope of the work.

41.47 All fittings like `T'-pieces, weld neck flanges, reducers etc., shall be suitably matched with pipes for welding. The valves will have to be checked, cleaned or overhauled in full or in part before erection after chemical cleaning and during commissioning.

41.48 The contractor shall be responsible for correct orientation of all valves so that seats, stems and hand wheels will be in desired location. It is the responsibility of the contractor to obtain the information regarding orientation of valves not fully located on drawings before the same are installed.

41.49 Suspension for piping, etc., will be supplied in running lengths, which shall be cut to suitable sizes and adjusted as required.

41.50 The adjustment of all hangers & supports erected in both cold & hot conditions for maintaining the proper slopes towards the drain pots and application of cold pull in the piping wherever required is also included in the scope of the contractor.

41.51 No temporary supports should be welded on the pressure parts and piping. In case of absolute necessity prior approval should be taken from BHEL Engineer. In such cases the contractor if required, shall carry out heat treatment.

41.52 Spring suspensions / constant load hangers have to be pre-assembled for required load and erection carried out as per instructions of BHEL. Any adjustments, removal of temporary arrests / locks etc., have to be carried out as and when required.

41.53 Contractor shall install piping in such a way that no excessive or destructive expansion forces exists in either the cold condition or under conditions of maximum temperature and pressure. All bends, flanges, orifices, expansion joints and any other special fittings necessary to take care of proper expansion shall be incorporated as per the advice of Engineer. During installation of expansion joints, anchors, care must be taken to see that full design movement is available at all times from maximum and minimum temperature.

41.54 The hanger assemblies shall not be used for attachment of rigging to hoist the pipes into position. Other means shall be used to securely hold the pipe in position till pipe supports are completely assembled and attached to the pipe and building structure.

41.55 Layout of small-bore piping in boiler, oil systems etc. as required shall be done as per site requirement. Necessary sketch for routing these lines should be got approved from BHEL by the contractor. There is a possibility of slight change in routing the above pipelines even after completion of erection or from aesthetic point of view. Contractor at no extra cost should carry this out. As built drawing is to be submitted by the contractor after erection completion.

41.56 All the valves, including motorized valves, flap valves, dampers, actuators, etc. shall be serviced and lubricated to the satisfaction of Engineer before erecting the same and during pre-commissioning also. Welding or jointing of extension spindle for valves to suit the site conditions and operational facility shall be part of erection work within the quoted rates.

41.57 Erection and welding of necessary instrumentation tapping points, thermocouple pads, thermo-wells, valves, battery of first root valves, condensing vessels, flow nozzles and control valves to be provided on, auxiliaries and pipe lines are covered within the scope of this specification. This will be the responsibility of the contractor and will be done as per the instructions of BHEL Engineer. The welding of all the above items will be contractor's responsibility even if the:

a Product groups, under which these items are released, are not covered in the scope of this tender.

b Items are supplied by any agency other than BHEL.

41.58 The contractor shall carry out the tightening of the field bolts on the equipment and piping covered under this specification by using either the calibrated torque wrench method or the turn of part method. The methods used the tools and the equipment deployed shall be subject to the approval of Engineer. The competent technicians shall carry out the bolting work.

41.59 The contractor shall assist BHEL in preparation of as built piping drawing.

41.60 Erection of power cylinders, motorised valves, valve actuators etc. coming under various groups is covered under the scope of this specification. However C&I calibration / commissioning for pneumatic valves, actuators & power cylinders shall be arranged by BHEL through C&I agency at no cost to the contractor for this package. The contractor will however be responsible for drawing the materials from the stores and handing over to the agency that is to commission these. Any damage / loss in their custody will be the contractors account. The alignment and any mechanical adjustments including link adjustment, opening & reconnection of links, replacement of valve / actuator or any mechanical part, air filter & regulator cleaning etc. required during calibration and operation, the same shall be carried by the contractor for this package. However, if re-calibration is required till handing over of the equipments the same shall be organised by the contractor for this package as detailed above with in the final accepted rates. The contractor will however be responsible for drawing the materials from the stores and handing over to the agency that is to commission these. Any damage / loss in their custody will be the contractors account.

41.61 The erection of all pneumatic power cylinders for the burner-tilt mechanism and SADC is covered within the scope of this specification. BHEL will get these power cylinders for the burner-tilt mechanism and SADC calibrated & commissioned. The contractor for this scope of work shall assist and co-ordinate for the same with the agency engaged by BHEL to calibrate such pneumatic actuators.

41.62 The Erection, testing and commissioning of all electrically operated valves, actuators and dampers is covered within the scope of this specification.

42.0 WELDING, HEAT TREATMENT, RADIOGRAPHY AND NON-DESTRUCTIVE TESTING

42.1 The pressure parts, equipment and piping shall be erected in conformity with the provisions of Indian Boiler Regulation and as may be directed by BHEL as per any standard / specification in practice in BHEL. The method of welding (arc, gas, TIG or other method) may be indicated in the detailed drawings / schedules. BHEL Engineer will have the option of changing the method of welding as per site requirements. **Semi automatic welding (GMAW) process shall be used for non-pressure parts / ducting / structures etc to the maximum possible, considering its cost efficiency, better quality and time saving features.**

42.2 Welding of pressure parts, equipment, piping, high tensile structural steel shall be done by certified high pressure welders who posses valid certificate of CIB of the State in which the equipment is erected as per provision of IBR. The H.P. welder who possesses necessary certificate shall ensure re-validation as per relevant provisions of IBR and keep the certificate

valid till the completion of work. The services of such welders, the validity of whose certificates have expired shall not be utilized for high-pressure works.

42.3 All welders including tack welders, structural and high pressure welder shall be tested as per ASME section IX / IBR and approved by BHEL Engineer before they are actually engaged on work even though they may possess a valid IBR certificate. BHEL reserves the right to reject any welder if the welder's performance is not found to be satisfactory. The contractor shall maintain the records of qualification AND performance of welders. BHEL Engineer will issue all the welders qualified for the work, an identity card. The welder will keep the same with him at work place at all times. He may be stopped from work if he is not found in possession of the same.

42.4 Engineer may stop any welder from the work if his performance is unsatisfactory for any technical reason or if there is a high percentage of rejection in the joints welded by him. The welder's is having passed qualification tests does not absolve the contractor of contractual obligation to continuously check the welder's performance.

42.5 Faulty welds caused by the poor workmanship shall be cut and re-welded at the contractor's expense. The Engineer prior to any repair being made shall approve the procedure for the repair of defective welds. After the repair has been carried out, the compliance shall be submitted to the quality engineer.

42.6 The contractor shall carry out the root run welding of all HP / LP piping, valves by TIG welding method only. The contractor shall have to carry out full TIG welding of butt weld joints of tubes / pipes of lesser thickness if required. During the root runs of stainless steel joints, the contractor shall before and during welding have to purge the pipes with inert gas. All weld joints for temporary piping required for alkali flushing, acid cleaning and steam blowing should be got done by HP welders only. The root run should be done by TIG welding. All arrangements required for the above shall be the responsibility of the contractor at no additional cost. Argon Purging is to be done for TIG Run of SS Pipes

42.7 All expenses for testing of contractor's welders including destructive and nondestructive tests conducted by BHEL at site or at laboratory shall have to be borne by the contractor only. Limited quantity of tube and pipe material required for making test pieces will be supplied by BHEL free of cost.

42.8 The regulators used on welding machines shall be calibrated before putting these into use for work. The Contractor at his cost shall also arrange periodic calibration for the same.

42.9 **Only BHEL approved electrodes and filler wire will be arranged and used by the contractor**, within the finally quoted price. BHEL reserves the right to test any approved electrode being used by the contractor. Testing charges for the same shall be borne by the contractor. All electrodes shall be baked and dried in the electric electrode-drying oven to the required temperature for the period specified by the Engineer before these are used in erection work. All welders shall have electrodes drying portable oven at the work spot. The electrodes brought to the site will have valid manufacturing test certificate. The test certificate should have a co-relation with the lot number / batch number given on electrode packets. No electrodes will be used in the absence of above requirement. The thermostat and thermometer of electrode drying oven will be also calibrated and test certificate from Govt. approved / accredited test house traceable to National / International standards will be submitted to BHEL before putting the oven in use. The contractor shall also arrange periodical calibration for the same.

42.10 All butt / fillet welds shall be subject to dye penetration test/ other tests as per the instructions of the engineer at no additional cost.

42.11 The contractor shall maintain a record in the form as prescribed by BHEL of all operations carried out on each weld. He has to maintain a record indicating the number of welds, the names of welders who welded the same, date and time of start and completion, preheat temperature, radiographic results, rejection if any, percentage of rejection etc. and submit copies of the same to the BHEL Engineer as required. Interpretation of the BHEL Engineer regarding acceptability or other wise of the welds shall be final.

42.12 The contractor shall carry out the edge preparation of weld joints at site in accordance with the details acceptable to BHEL Engineer. Wherever possible machining or automatic flame cutting should be done. Gas cutting will be allowed only wherever edge preparation otherwise is impractical. All slag / burrs shall be removed from the edge and all the hand cuts shall be ground smooth to the satisfaction of engineer.

42.13 All welds shall be painted with anticorrosive red oxide paint once radiography and stress reliving works are over. Necessary consumables and scaffolding etc including paints shall be provided by contractor at his own cost.

42.14 Pre-heating, radiography and other NDT tests, post heating and stress relieving after welding of tubes, pipes, including attachment welding wherever necessary, are part of erection work and shall be carried out by the contractor in accordance with the instructions of the Engineer. Contractor at his cost shall arrange all equipment and consumables essential for carrying out the above process.

42.15 Contractor shall arrange all necessary stress relieving equipment with automatic recording devices. The contractor shall arrange for labour, heating elements, thermocouples, thermo-chalks, temperature recorders, thermocouple attachment units, graphs, sheets insulating materials like asbestos cloth, ceramic beads, asbestos ropes etc. required for heat treatment/ stress-relieving operations. The contractor should take a note of the following,

- Temperature shall be measured by thermocouple and recorded on a continuous printing type recorder. All the recorded graphs for heat treatment works shall be the property of BHEL.
- All stress relieving equipment will be used after due calibration and submission of test certificate to BHEL. Periodic calibration from Govt. Approved / accredited Test Houses traceable to National / International standards will also be arranged by the contractor for such equipment at his cost.
- The contractor shall obtain the signature of Engineer or his representative on the strip chart of the recorder prior to the starting of SR operations.

42.15 The contractor shall also be equipped for carrying out other NDT like LPI / MPI / Hardness test etc. as required as per welding schedules / drawings within the finally accepted price / rates. Ultrasonic testing, wherever required, will be arranged by BHEL. Necessary help in conducting the UT shall however be rendered by contractor.

42.16 The technical particulars, specification and other general details for radiography work shall be in accordance with ASME, IBR or ISO as specified by BHEL.

42.17 The contractor for radiography work shall use iridium-192/Cobalt 60 or any other source as applicable and decided by BHEL engineer. The geometric un-sharpness shall not exceed 1.5 mm. The contractor should take adequate safety precautions while carrying out radiography. Contractor at his cost shall arrange necessary materials/safe guards required for radiography (including personnel from BARC).

42.18 Low speed high contrasts, fine grain films (D-7 or equivalent) in 10 cm width only be used for weld joint radiography. Film density shall be in between the range of 1.5 to 2.0.

42.19 All radiographs shall be free from mechanical, chemical or process marks, to the extent they should not confuse the radiographic image and defect finding. Penetrameter as per ASME or ISO must be used for each exposure.

42.20 Lead numbers and letters are to be used (generally 6mm size) for identification of radiographs. Contract number, joint identification, source used, welder's identification and SFD are to be noted down on paper cover of radiograph.

42.21 Lead intensifying screens for front and back of the film should be used as per the above-referred ASME specification.

42.22 The joint is to be marked with permanent mark A, B, C to identify the segments. For this a low stress stamp shall be used to stamp the pipe on the down streamside of the weld.

42.23 For multiple exposures on pipes, an overlap of about 25-mm of film should be provided.

42.24 Radiography personnel with sufficient experience and certified by M/s BARC for conducting radiographic tests in accordance with safety rules laid down by Division of Radiological protection only have to be deployed. These personnel should also be registered with DRP / BARC for film badge service.

42.25 All arrangements for carrying out radiography work including dark room and air conditioner and other accessories shall be provided by contractor within the space allotted for office at his cost. As an alternative the contractor may deploy an agency having all above facilities and who are duly approved / accredited by BARC and / or other Regulatory authorities. Detailed particulars of such agencies will be submitted and got approved by BHEL Engineer before the actual deployment of agency for radiography work.

42.26 The contractor shall have a dark room fully equipped with radiography equipment, film (un-exposed), chemicals and any other dark room accessories.

42.27 Contractor shall note that 100% radiography will be done at the initial stages on all the piping welding joints. Subsequently radiographic inspection will be done on the basis of quality of welding. However minimum percentage of joints to be radiographed shall not be less than the requirement of BHEL welding schedule / IBR / Customer's requirements. The percentage may be increased depending upon the quality of joints and at the discretion of BHEL. Radiography on LP piping joints is not envisaged. However other NDT test as called for in the FQP including LPI, MPI and HT will have to be carried out.

42.28 All the Radiographs shall be properly preserved and shall become the property of BHEL. They are to be reconciled with the work done, joints radiographed and submitted to BHEL / customer.

42.29 Since radioisotopes are being used, all precautions and safety rules as prescribed by BHEL/BARC/ Customer shall be strictly followed. BARC / DRP certificate to be provided before taking up the work.

42.30 Radiography of joints shall be so planned after welding, that the same is done either on the same day or next day of the welding to assess the performance of HP welders. If the performance of welder is unsatisfactory, he is to be replaced immediately.

42.31 Wherever radiographs are not accepted, on account of bad shot, joints shall be re-radiographed and re- submitted for evaluation.

42.32 However, if the defect persists after first repair, further repair work followed with radiography shall be repeated till the joint is made acceptable. In case the joint is not repairable, the same shall be cut, re-welded and re-radiographed at contractor's cost.

42.33 If the contractor does not carry out radiography work due to non-availability of source / film / chemical / operator etc., BHEL will get the work done departmentally or through some other agency at the risk and cost of the contractor.

42.34 Heat treatment and radiography may be required to be carried out at any time (day and night) to ensure the continuity of the progress. The contractor shall make all necessary arrangements including labour, supervisors/ Engineer required for the work as per directions of BHEL.

42.35 The contractor shall assist BHEL Engineer in preparing complete field welding schedule for all the field welding activities to be carried out in respect of piping and equipment erected by him involving high pressure welding at least 30 days prior to the scheduled start of erection work at site. The contractor shall strictly adhere to such schedules.

42.36 For T/P 91 materials welding, clauses no. 54.0 of this tender will be applicable besides above-mentioned clauses. **NOT APPLICABLE FOR THIS TENDER**.

43.0 APPLICATION of INSULATION and REFRACTORY

43.1 All attachment welding, including welding of hooks / supports as per pitch both on equipment and piping shall be done as directed by Engineer. Attachment welding shall have to be done by certified welders. If necessary contractor may have to cut the hooks to correct length without any extra cost to BHEL.

43.2 Contractor has to supply and apply heat resistant primer on welded portions before application of insulation.

43.3 The mineral wool mattresses (bonded / un-bonded) / LRB mattresses are received at site in standard sizes. These are to be dressed / cut to suit site requirements by the contractor.

43.4 The number of layers / thickness of mineral wool / LRB mattresses for auxiliaries, pipe lines, valves and other vessels shall be as per various drawings and as directed by Engineer. For applying the mineral wool mattress, the required holding materials, if necessary by fabrication of rings/ hooks shall be fixed as directed and as per drawings and spec.

43.5 The contractor should ensure proper finishing of surface of the insulation, sheeting and cementing

43.6 The contractor should ensure that the finished surface of the insulation works conforms to the dimensions and tolerances given in the drawings. Aesthetic finish and accuracy of work are most important.

43.7 It is the responsibility of the contractor to ensure that the insulation materials and sheet metal covering issued to him for application are well protected against loss or damage from weather conditions. Closed / semi closed sheds or any other arrangements required for this will be made by him at his cost. If any damage occur to the material due to improper storage or due to any causes attributable to the contractor except for normal breakage or damages allowed in such cases, the cost of such damaged material shall be to the account of the contractor.

43.8 Aluminum sheet cladding will be fabricated to the sizes and shapes specified in drawings. Beading, swaging, beveling of sheets, crowning the sheets if necessary will be carried out by him. Two coats of anti-corrosive black bituminous paint are to be applied on inner surfaces of the cladding. Bitumen sealing compound on the joints if necessary is included in the scope of this work. **Contractor may note that they will also supply anti-corrosive black bituminous paint and bituminous sealing compound required for above works at his cost. However, if any material is received from the unit, the same shall be issued free of cost to the contractor**

43.9 Aluminum sheet metal cladding over insulation will consists of plain / ribbed / corrugated sheets. The sheets will be supplied in standard sizes. Cutting them to required size, grooving, fabricating bends, boxes etc., for proper covering is contractor's responsibility. Any cutting / bending / welding of fabricated skin casing sheets if required will also be covered within the scope of this contract.

43.10 A logbook shall be maintained by the contractor to obtain clearance for application of insulation. If the contractor does the work on his own accord without prior permission the area may have to be redone at his cost.

43.11 Contractor is liable for the exact accounting of the material issued to him and he shall make any unaccountable losses good. Wastage allowance for the material issued are as below:

1. Wool / LRB mattresses and cladding sheets…… 2%
2. Insulation bricks and mortar…….. 2%
3. Castable refractory…….. 1%

43.12 The entire surplus, unused materials etc., supplied by BHEL shall be returned to BHEL after the work is over. Materials like gunny bags and packing materials, empty containers may be returned at periodical intervals.

43.13 The contractor shall leave certain gaps and opening while doing the work as per instructions of BHEL engineer to facilitate inspection during commissioning and to fix gauges, fittings and instruments. The gaps will have to be finished as per drawings at a later date by the contractor at his cost.

43.14 If during erection and commissioning any of the parts are to be temporarily fixed and then replaced by permanent ones at a later date or if any of the parts are to be removed for modification, rectification, adjustment and then refitted or if some parts are to be opened for inspection and checking and for measurement of metal surface temperature the same may necessitate removal and re-application of insulation and sheet metal cladding, which shall be done by the contractor and the erection rate quoted shall be inclusive of such contingencies.

43.15 Removable type of insulation shall be provided for valves, fittings, expansion joints etc as per the drawings or as directed by BHEL Engineer.

43.16 All temporary pipelines required during testing, pre-commissioning and commissioning should be insulated as directed by BHEL at no extra cost to BHEL. However required insulation material shall be issued by BHEL free of cost.

43.17 Insulation of expansion joints, dampers, etc shall be carried out after NDT / gas tightness test is completed.

43.18 Special type of Insulation wool used in pent house shall not be cut indiscriminately.

43.19 Contractor shall mix and apply the refractory / insulation as per the instructions of BHEL Engineer. Castable refractory / insulation after application shall be cured as per the instructions of BHEL Engineer. The contractor shall provide the required quantity of wire nails, planks for formwork and other materials for centering and grouting work.

43.20 Application of castable and pourable refractory between tubes, around burners, on ceiling and as directed by Engineer and as per detailed drawings and specifications.

43.21 Dressing of insulation brick to suit site conditions, curing refractory concrete applied/sheet cladding over insulation forms a part of this work.

43.22 Contractor shall observe all precautions for laying / curing of castable refractory. Any defective works found shall be re-laid by contractor at his cost.

43.23 Making structural supporting work for pourable insulation, laying pourable insulation, adhering to all specifications and instructions during application forms a part of this work.

43.24 Day to day cleaning of insulation debris and scraps to be ensured by the contractor. Excessive wastage will attract cost recovery.

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

44.1 The contractor shall carry out all the required tests and pre-commissioning and commissioning activities required for their successful and reliable operation. These would include hydraulic test of boiler, land flow test, clean air flow test, assistance for chemical cleaning of piping and boiler, water washing, oil flushing of oil system etc. as instructed by BHEL using contractors own consumables, labour and scaffoldings etc. Air leak test on pressure parts preliminary to hydraulic test by compressed air shall also be carried out to check and rectify the various leakage and defects etc.

44.2 All the chemicals required for carrying out these activities will be supplied by BHEL free of cost.

44.3 All required tests (Mechanical and electrical) indicated by BHEL and their clients for successful commissioning are included in the scope of these specifications. These tests / activities may not have been listed in these specifications.

Specialized test equipment, if any, shall be provided by BHEL / its client free of hire charges. However contractor has to take proper care of the equipment issued to him.

44.4 After completion of erection of furnace, ducts and air heaters, a test shall be performed on the steam generator by the contractor to establish the tightness of the erected equipment from the outlet of FD fan through the steam generator up to stack.

44.5 All the tests may have to be repeated till all the equipment satisfy the requirement / obligation of BHEL at various stages. The contractor shall do all the repairs for site-welded joints arising out of the failure during testing.

44.6 The scope of pre-commissioning activities cover installation of all necessary equipment including temporary piping, supports, valves, blanking, pumps, tanks, with access platforms valves, along with accessories required for hydro test, steam blowing or for any other tests. The scope also covers the off site disposal of effluents.

44.7 All items / material required for conducting hydraulic test, alkali boil out, steam blowing etc., will be supplied by BHEL / its customer. However, servicing, dismantling and returning of the same to stores is the responsibility of the contractor who is erecting the equipment / piping. The contractor may note that **no separate payment shall be released for any temporary works** that are to be carried out for conducting pre-commissioning and commissioning tests. Bidders are advised to include expenses on temporary works along with the rates being quoted by them. Broadly the work on temporary systems will be as under:

Boiler : Erection etc. of all temporary piping along with insulation and supports for steam blowing; affluent disposal etc.are to be carried out as part of Boiler work**.** However **Installation and operation** of all equipment for chemical cleaning including tanks and electrical switchgear along with their accessories shall be carried out by **another agency.** But the contractor shall provide all required assistance to BHEL's agency for the chemical cleaning work.

The above is only a broad breakup of the temporary works. The engineer at site will make final break up. His decision will be final and binding by all the parties.

Dismantling of the temporary equipment and piping will be done by the agency that has erected the equipment. He will also return the equipment to the stores.

44.8 Commissioning of the boiler will involve trial run of all the equipments erected. The boiler has to be lighted up for refractory drying, alkali boil out, acid cleaning, passivation, preservation, steam blowing and floating of safety valves. Flushing of all the lines by air, oil or steam as the case may be, trial run of the boiler, servicing of valves and any other works incidental to commissioning are to be carried out. During this period though the BHEL's customer's staff will also be associated in the work, the contractor's responsibility will be to arrange for the

complete requirement of supervision, men, consumables, T&P and IMTEs till such time the commissioned units are taken over by the BHEL's customer.

44.9 It shall be the responsibility of the contractor to preserve the boiler as per BHEL's requirement.

44.10 It shall be the responsibility of the contractor to provide various category of workers in sufficient numbers along with Supervisors during Pre-commissioning, commissioning and post commissioning of equipment and attending any problem in the equipment erected by the contractor till handing over. The contractor will provide necessary consumables, T&Ps, IMTEs etc., and any other assistance required during this period. Association of BHEL's / Client's staff during above period will not absolve contractor from above responsibilities.

44.11 It shall be specifically noted that the above employees of the contractor may have to work round the clock along with BHEL Engineers and hence overtime payment by the contractor to his employees may be involved. The contractors finally accepted rates should be inclusive of all these factors also.

44.12 In case, any rework is required because of contractor's faulty erection, which is noticed during pre-commissioning and commissioning, the same has to be rectified by the contractor at his cost. If any equipment / part is required to be inspected during pre-commissioning and commissioning, the contractor will dismantle / open up the equipment / part and reassemble / redo the work without any extra claim.

44.13 During commissioning, opening / closing of valves, changing of gaskets, realignment of rotating and other equipment, attending to leakage and adjustments of erected equipment may arise. The finally accepted price / rates shall also include all such work.

44.14 The contractor shall make all necessary arrangements including making of temporary closures on piping / equipment for carrying out the hydro-static testing on all piping, equipment covered in the specification at no extra cost.

44.15 The valves will have to be checked, cleaned or overhauled in full or in part before erection, after acid cleaning, steam blowing and during commissioning as may be necessary.

44.16 In case any defect is noticed during tests, trial runs and commissioning such as loose components, undue noise or vibration, strain on connected equipment etc., the contractor shall immediately attend to these defects and take necessary corrective measures. If any readjustment and realignment are necessary, the contractor at his cost shall do the same as per Engineer's instructions including repair, rectification and replacement work. The parts to be replaced shall be provided by BHEL.

44.17 All temporary supports shall be removed in such ways that pipe supports are not subjected to any sudden load. During hydraulic testing of pipes, all piping having variable spring type supports shall be held securely in place by temporary means while constant spring type support hangers shall be pinned or blocked solid during the test.

44.18 The contractor shall carry out cleaning and servicing of valves and valve actuators prior to pre-commissioning tests and / or trial operations of the plant. A system for recording of such servicing operations shall be developed and maintained in a manner acceptable to BHEL Engineer to ensure that no valves and valve actuators are left un-serviced. Wherever necessary as required by BHEL Engineer, the contractor shall arrange to lap / grind valve seats.

44.19 Cleaning and servicing of all the filters / strainers, toppings of oils coming in the system shall be done by the contractor within the accepted price.

44.20 At the time of each inspection, the contractor shall take note of the decisions / changes proposed by the Engineer and incorporate the same at no additional cost. The contractor shall carry out any other test as desired by BHEL Engineer/ Manufacturer on erected

equipment covered under scope of this contract during testing and commissioning to demonstrate the physical completion of any part or parts of the work performed by the contractor

45.0 FINISH PAINTING

45.1 All exposed metal parts of the equipment, structure, auxiliaries, piping, and other items (covered within the scope of this contract) after installations are to be painted. The surfaces are to be thoroughly cleaned of all dirt, rust, scales, grease, oils and other foreign materials by wire brushing, scrapping, any other method as per requirement of BHEL. The same will be inspected and approved by the engineer before painting.

45.2 Mostly the equipment / items/ components will be supplied with one coat of primer paint and one coat of finish paint. However during storage and handling, the same may get peeled off / deteriorate. All such surfaces are to be thoroughly cleaned and to be touch up/ painted with suitable approved primer and finish paint matching with shop paint / approved final colour. Besides above two coats of approved primer paint is to be applied on all the bare / unpainted surfaces. The gas cut stubs would require being ground and rounded.

45.3 After applying the primer paints, wherever required, all structure / equipment / items, shall be finish painted with paints **enamel/epoxy/**as specified by BHEL engineer. The number of coats / paint thickness shall be as indicted in the drawing / documents. However at least two coats of finish painting is to be applied. In case proper finish is not obtained in two coats, the contractor shall apply additional coat (s) till proper finish / paint thickness is achieved. Certain equipment / Items are required to be painted with approved quality heat resistant paint / primer. After completion of painting all bright spots shall be cleaned to the satisfaction of Engineer.

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

45.5 **Contractor at no extra cost to BHEL shall supply all paints; primers, tools and other consumables including scaffolding materials required for finish painting. Paint is to be BHEL approved make only 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.

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

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

45.8 The painters have to under go test and only qualified painters will be allowed to work.

46.0 PROGRESS REPORTING

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

46.2 Weekly progress review meetings will be held at site during which actual progress during the week vis-à-vis scheduled program shall be discussed for actions to be taken for achieving targets. Contractor shall also present the program for subsequent week. The contractor shall constantly update / revise his work program to meet the overall requirement. All quality problems shall also be discussed during above review meetings. Necessary preventive and

corrective action shall be discussed and decided upon in such review meetings and shall be implemented by the contractor in time bound manner so as to eliminate the cause of non-conformities.

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

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

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

47.0 DRAWINGS AND DOCUMENTS

47.1 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.

47.2 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.

47.3 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.

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

47.5 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.

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

48.0 INCOME TAX , SERVICE TAX AND SALES TAX ETC

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

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

With introduction of Cenvat credit rules 2004 which came into force w.e.f. 10.09.2004, excise duty paid on input goods including capital goods used for providing the output service and service tax paid on input service can be taken credit of against the service tax payable on output service. **As**

such, while offering the rates, the contractors may take into account the benefit of above provisions as the cost of input to contractors will be the cost net of excise duty and service tax and adjust their offer price accordingly to make it more competitive. In respect of Construction Services**,** the contractor should avail abatement of 67 % as per notification no. 15/2004-ST dated 10.09.2004 as & if applicable.

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

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

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

48.5 Contractor has to make his own arrangement at his cost for completing the formalities (Including arrangement of Road Permits, if any), 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.

49.0 EXTRA WORK:

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

(A) Require major revamping or rework and which are totally unusual to normal erection work.

(B) Require rectification / modification for improvement in the design during commissioning,

(C) Requiring fresh fabrication of components in place of rejected / replaced components.

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

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

50.0 PRICE VARIATION

50.1 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 = Gross billed amount for the month as per contract provisions.

F1 = All India CPI published by Labour bureau, Simla, Govt. of India, for Industrial workers (Base 2001 =100) applicable for the month under consideration i.e. for which bill has been raised.

F0 = All India CPI published by Labour bureau, Simla, Govt. of India, for Industrial workers (Base 2001 =100) applicable for the month of opening of technical bid.

50.2 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 on month-to-month basis from the date of award. BHEL however reserves the rights to freeze variation for that much of duration of delays, from time to time, which are entirely attributable to the contractor. **Average of applicable index of PVC paid shall be taken as index for PVC FOR final 4% amount.**

50.3 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 variation 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.

51.0 RATE SCHEDULE

51.1 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.

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

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 may vary to any extent and no compensation will be payable in variation of quantity. However, in case of overall 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 required to take above into account while quoting. The contractor confirms that the rate quoted above takes care of such variation during execution stage.

52.0 INSTRUCTIONS TO TENDERERS

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

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

52.3 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 the site conditions. Once the tenderer has quoted for the work, it is implied that he has ascertained various site conditions and NO CLAIM whatsoever will be entertained by BHEL on any such account.

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

52.5 **LIQUIDATED DAMAGES (LD)**

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

52.6 SECURITY DEPOSIT

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

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

52.7 OTHERS

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

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

SECTION - III B

SPECIAL CONDITIONS OF CONTRACT

SECTION - III B

SPECIAL CONDITIONS OF CONTRACT

53.0 SCOPE OF WORK

53.1 **The scope for these specifications covers Dismantling in selected areas, Erection/Re-Erection, overhauling/servicing, testing & commissioning of Boilers generally but not limited to following:**

- Dismantling of selected items in specified areas, and transportation of same and storing in specified areas within the powerhouse premises.
- **Taking delivery of the boiler materials from the project storage yard / stores / sheds to erection site.**
- Their preservation, safe keeping and watch and ward.
- Checking, dressing, chipping and leveling of foundations.
- Pre-assembly, overhauling, erection, alignment of various equipments, machining and grouting.
- Carrying out of Special processes as per clause 55.0
- Welding, heat treatment, radiography, UT and other non-destructive tests wherever required
- Hydraulic testing and other pre commissioning tests,
- Insulation and finish painting including supply of paints etc.,
- Assistance during Chemical cleaning, alkali boil out, acid cleaning and passivation, PG test as per the scope given in the tender.
- Steam blowing and safety valve floating including erection and dismantling of all temporary piping, valves, pumps, tanks etc. required for above operations and other commissioning activities including post commissioning operations and stabilisation of the units,
- Unit trial operation, resolving any deficiencies observed and handing over of 3 x 200 MW Boiler Units 9,10 & 11 of OBRA 'B' TPS of UPRVUNL Obra Distt. Sonebadra UP.
- **Assistance during PG test**

Detailed scope of work, tentative execution bar chart and details of welding joints are enclosed as per Annexures A, B & C respectively.

53.2 **The PGMA wise break up of boilers is tentative as indicated under Annexure-I PART I.** In case of dispute regarding the tonnage indicated, the decision of the BHEL Engineer with respect to scope, and keeping the work suitability, quality and time schedule will be final and binding on the contractor.

Scope of Boiler for this tender is up to BOF (Boiler Outlet Flange) which includes main boiler / furnace, structures, pressure parts, air heaters, associated ducts (including ducts between air heater and FD/PA fans), burners, Pulverised coal piping, mills, fans oil system, integral piping, Piping (as specified) structures along with cladding, rotary parts etc. Final connection at boiler outlet flanges (whether bolted / welded or both) with ducting, coal pipes with mills, or any other connection will be in the scope of this contract.

Painting and insulation on items covered shall be covered under this specification.

53.3 **Approx. weight of the new items to be erected for the Boiler & Auxiliaries for 3 units shall be 9825MT (as indicated in Annexure-I PART I).** However, the contractor is required to erect actual tonnage (irrespective of any variation plus or minus) which may be necessary to complete their work and commission above boilers and complete the work in all respects as detailed in the tender specifications, for which payments shall be released on finally accepted tonnage rates.

The contractor undertakes to erect / commission actual quantities as per advice of BHEL Engineer and accordingly the final contract price shall be worked out on the basis of quantities actually erected at site and payments will also be regulated for the same. However, in case of overall reduction in contract value beyond 30%, the contractor will be eligible for compensation as detailed in clause number 51.2 of the NIT.

Apart from weights indicated above, dismantling of existing items to the extent of 3400 MT, 3400 MT AND 3700 MT (Approx .) for units 9, 10 & 11 respectively will be carried out by the contractor.

Out of these Approx. 200T, 150T and 300T for units 9,10 & 11 respectively . (Buckstay, II pass SC Wall, structures) have to be re-erected after servicing/repair/rectification. For re erection of such items/scope no separate payments will be made**. Break up of dismantling activities shall be as per Annexure-I PART II.**

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

53.4 **The contractor under this contract shall also provide free of cost services of skilled persons for a total period of 108 Man-months exclusively for use by BHEL. This manpower will be required for following services**

- Qualified computer operators for office work. (36 man months)
- Skilled workers for working in store, office and colony. (36manmonths)
- Unskilled workers for working in store, office and colony. (36 manmonths)

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 manmonths as per above provision, fully or partly, recovery at the rate of the prevailing minimum wages at Site for the workers categories stated above plus 10% will be made from the final bill of the contractor.

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

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 manmonths as per above provision, fully or partly, recovery at the rate of Rs.20000/- against each man-month will be made from the final bill of the contractor.

53.6 Contractor shall make necessary arrangements to ensure that the atmosphere in working area (under the scope of work in this tender) and on roads is free from particulate matter like dust, sand etc. by keeping the top surface wet for ease in breathing. Provision of required tanker with spraying arrangement has to be ensured by contractor within the quoted rates, at no extra cost to BHEL

Contractor shall ensure following:

1. Contractor has to maintain contact with local hospital having ambulance, 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 & ambulance 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 53.6 (1).

53.7 **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.

53.8 **Contractor shall make necessary arrangements to ensure following:**

1. **Contractor for work shall ensure deployment of qualified level-2 Engineer for NDT services at site.**
2. **Contractor shall ensure deployment of Qualified & Experienced Safety Engineer / Officer at site.**
3. Contractor shall ensure that all the **T & Ps deployed** by them, including cranes, (Indicative lists of **T&Ps and IMTEs to be arranged by the contractor are given as per Annexure-III.) are regularly certified by approved testing agency** & the relevant certificates to this effect are to be given to BHEL for records.

It may be noted that **non-compliance to the above three conditions** will result in **penal action** as may be decided by the competent authority of BHEL**.**

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. 200/- for the first violation and Rs. 500/- for the subsequent violations. For serious lapses, as decided by BHEL Engineer, fines upto Rs. 5000/- 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.

54.0 Special process for pipes/ tubes of T91 materials----- (**This clause is NOT APPLICABLE against this tender)**

Welding in T91 materials --------- (**This clause is NOT APPLICABLE against this tender)**

55.0 <u>CEILING GIRDERS LIFTING FOR UNIT NOS. 9 and 11</u>

55.1 **The replacement of CEILING GIRDERS is to be done by CRANE.**

55.2 Ceiling girder is to be received from stores, transported, pre assembled, unloaded, shifted, dragged, positioned, erected & aligned.

55.3 HSFG Bolts are to be tightened by calibrated torque wrench as per the instructions of the Engineer. These should be check tightened / re-tightened by torque wrenches before girder lifting / as instructed by the Engineer.

56.0 CHEMICAL CLEANING

56.1 **Chemical Cleaning** will be carried by a separate agency deployed by BHEL. While the work of installation of tanks, Pumps, Piping and operation of the system is in the scope of that agency, the Contractor has to extend all assistance (including providing of welding power point) and complete interface requirements for the completion of the work.

57.0 FACILITIES TO BE PROVIDED BY BHEL/ CONTRACTOR

57.1 BHEL shall provide limited **open space for office and store/ workshop at site free of rental charge**. It is the responsibility of the contractor to construct sheds, provide all utilities like electricity, drinking water etc., as a part of his scope of work within the accepted rates. **Raw Water will be provided at one point by BHEL** from the water pipe line / source at BHEl premises / plant. **Free Electricity for office and workshop will be provided at one point as decided by BHEL**. Further distribution will have to be made by the contractors at their own cost. **Energy Meter for electricity will have to be provided by the Contractor at his own cost. All safety regulations are to be followed by the contractor.** Construction power will be provided at one point near the site free of charge by BHEL / customer. Accordingly, required energy meter, all cables, fuses, distribution boards, switches, switchboards, bus bars, earthing arrangements, protection devices e.g. ELCB if any, and any other installation as specified by statutory authority, client in this regard, for drawl of construction power shall be arranged by the

contractor. Obtaining approvals, payment of necessary fees, duties etc towards the clearance of such installations, prior to their being put to use or as may be specified, shall be the responsibility of the contractor.

It shall be the responsibility of the contractor to provide, maintain the complete installation on the load side of the supply with due regard to the safety requirements at site. All cabling and installations shall comply in all respects with the appropriate statutory requirements. Licensed and experienced electrician shall do the installation and maintenance of this.

In case of non-availability of customer supplied power, it is the responsibility of the contractor to make alternative arrangements. Contractor shall be adequately equipped to arrange standby diesel welding generators in the event of construction power failure. Essential welding jobs shall not be stopped on account of main construction power failure.

Contractor shall make all arrangements himself for the supply & distribution of construction water as well as potable water for labour and other personnel at work site /colony . Taxes, duties, levies, charges, if any, shall be borne by the contractor.

Contractor shall make all arrangements himself for the supply & distribution of construction water as well as potable water for labour and other personnel at work site /colony . Taxes, duties, levies, charges, if any, shall be born by the contractor.

The contractor has to make his own arrangement for accommodation and transportation of his workmen and other employees.

The free supply of power will not be provided for the use in the labour and staff colony. Power supply for the labour and staff colony shall be provided at one point the plant boundary. It shall be responsibility of the contractor to take the power supply up to the point of his use. The contractor shall be charged for the power supply to labour and staff colony at rates prevalent at the site. A source point for water supply may also be provided by CUSTOMER at the labour colony free of charge. The contractor for his labourers may also utilise this facility as per prevailing conditions. All arrangements for the distribution of water from source point for use at labour colony are in the scope of contractor

57.2 UPRVUNL may provide **area for labour colony, if available.** Other wise contractor has to make their own arrangements.

57.3 The Contractor shall be responsible for providing all necessary facilities like residential accommodation, sanitation, transport, electricity, water, medical facilities etc. at his own cost as required under various labour laws and statutory rules and regulations framed there under to the personnel employed by him.

57.4 **Construction power, for construction purposes will be provided free of cost** at one point for boiler erection site from supply point The contractor shall submit to the Engineer his electrical power requirements. Contractor at his cost shall do further distribution of power. All wiring must comply with local regulations and will be subject to Engineer's inspection and approval before connecting supply

NOTES:

- The contractor will be provided construction power free of charge.

- They will however ensure that there is no wastage. Periodical audits will be held to ensure that these resources are being optimally used. For this the contractor has to provide an energy meter at his end.
- In case any wastage is observed BHEL reserves the right to recover any charges / penalty as deemed fit.
- Contractor will have to provide proper insulated cables for power distribution and joints, if any, will be done with proper jointing kits .

57.5 **UPRVUNL shall supply free of charge water through pipe connection at suitable points for construction and electricity** at required voltage (415V, 3 phase and 230 V single phase **for construction**, operation , plant start-up, pre-commissioning, commissioning activities including testing. Electricity for construction power and light will be brought by UPRVUNL / BHEL at one point. Contractor shall arrange further distribution for construction purposes.

57.6 UPRVUNL shall provide and maintain all station illumination at site. Till such time such arrangements are made, the contractor at his cost should arrange for temporary lighting in and around his work area. However adequate lighting facilities such as flood lamps, hand lamps and area lighting shall be arranged by the contractor at the site of construction, contractor's material storage area etc. within finally accepted rates.

57.7 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.

57.8 Provision of distribution lines of both electrical power and water from the central points to the required place with proper distribution boards observing the safety rules laid down by the electrical authorities of the state shall be done by the contractor, supplying all the materials like cables, distribution board, switch boards, TPN, CBS, ELCBS/ MCCBS/ Copper / Brass clamps, copper conductor, change over switches pipes etc. If any failure is caused in supply of the power and water, it is the responsibility of the contractor to make alternate arrangements at his own cost. The contractor shall adjust his working shifts / hours accordingly and deploy additional manpower if necessary so as to achieve the targets.

57.9 The contractor while drawing construction power supply from Distribution Board should strictly adhere to following points.

a) All electrical installations should be as per Indian Electricity rules.

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

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

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

e) 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.

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

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

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

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

57.10 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.

57.11 In case of power cuts / load shedding no compensation for idle labour or extension of time for completion of work will be given to contractor.

57.12 UPRVUNL shall provide a suitable platform with proper lighting arrangement so that operations can be carried out through out the day and night however adequate lighting facilities such as floodlights, hand lamps and area lighting shall be arranged by the contractor at the site of construction, contractor's material storage area etc as well in labour colony.

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

57.14 NA

57.15 BHEL shall provide required chemicals for the purpose of chemical cleaning of Boiler.

57.16 Compressed air required for construction purposes shall be arranged by Contractor. However, compressed air required for the instrumentation, start-up and plant operation purposes shall be provided by the owner as per the requirement and specifications indicated by the contractor

57.17 **NA**

57.18 **Contractor should install a PC ALONG WITH MODEM to connect with our server (LAN) AT SITE**

58.0 TIME SCHEDULE

58.1 The contractor is required **to commence the work within 15 days from the date of issue of letter of intent** unless BHEL decides to fix any other later date.

58.2 Entire scope of work as detailed in tender specification **shall be completed, in all respect, as per following schedule (Within 15 Months)** from the scheduled date of start of work (EXPECTED IN NOVEMBER 2007) as per the programs / milestones indicated by BHEL from time to time.

Contractor has to adopt /extended hour working/3 shift round the clock working at site since the work has to be completed within a tight time schedule

Contractor has to mobilise adequate resources accordingly 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.**

58.3 **The tentative mile stone dates to be achieved, for UNIT # 9,10 & 11 as per the current status of contract are as below:**

Unit 9

MILE STONES	MONTH
Start of Erection	15 days from issue of LOI
Testing & Commissioning for Boiler & handing over	9th Month

Unit 10

MILE STONES	MONTH
Start of Erection	6/7th month from issue of LOI
Testing & Commissioning for Boiler & handing over & handing over	14th Month

Unit 11

MILE STONES	MONTH
Start of Erection	7/8th month from issue of LOI
Testing & Commissioning for Boiler & handing over & handing over	15th Month

Note: 1. Start of erection is based on anticipated shutdown schedule of Obra 'B' TPS and sequence of Shut down of units may also undergo change depending on change in shutdown schedule by customer.

2. Depending upon front and material availability, above milestones may required to be preponed by one month. Contractor is required to mobilize additional resources to meet above requirement within their quoted price.

3. Irrespective of start of work, the contractor has to organize his

work to achieve above milestones.

4. Tentative bar chart enclosed vide Annexure 'B'.

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

59.0 OVER RUN

59.1 In case due to reasons not attributable to the contractor, the work gets delayed and the scheduled completion gets extended, the contractor shall not be entitled for any over run compensation for a period of first **2 (Two) months** after the contractual completion date. In case the scheduled completion time gets **extended beyond 2 (Two) months** as stated above, the contractor shall be considered for payment of fixed over run charges, **@ Rs.75,000/- (Rupees Seventy Five Thousands only) per month** on receipt of advance notice intending to claim over run and 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) Contractor achieves the targets fixed during the over run period.

However, the over run charges shall be limited to 10% of the contract value.

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

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

60.0 TERMS OF PAYMENT

60.1 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.

60.2 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.

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

I.A PROGRESSIVE PAYMENT on pro-rata basis

(95% of unit rates)

(Applicable for DISMANTLING work for Sl. No. 2 of rate schedule)

1 95% of the applicable amount on completion of dismantling, work completion and area cleaning of each scope of each unit. Billing for dismantling to be done **as per break up applicable for dismantling as indicated in Annexure I PART II.**

IB **PROGRESSIVE PAYMENT on pro-rata basis**

(81 % of unit rates)

(Applicable for installation of all items except Insulation work for sl. No. 1 of main rate)

1. 15% of the applicable contract unit rate on pro-rata basis on completion of pre assembly wherever required and 16% of the applicable contract unit rate on pro-rata basis on placement in position and rough alignment.

OR

31% of the applicable contract unit rate on pro-rata basis on placement in position and rough alignment for the items where pre-assembly is not involved.

2. 50% of the applicable contract unit rate on pro-rata basis on completion of final alignment / fastening / welding / grouting along with proper supports including radiography / NDT / stress relieving wherever involved.

I.C **PROGRESSIVE PAYMENT on pro-rata basis**

(81% of unit rates)

(Applicable for INSULATION AND REFRACTORY work for sl. No. 1 of main rate)

1. 66% of the applicable contract unit rate on fabrication/fixing of retainers, lagging & stitching of mattresses and welding of retainers, fixing of casing supports, fabrication, beading, sealing, bitumen painting, installation and screw fixing of cladding & completion of all jobs as per specifications. The above work includes transportation of required material on location and its proper protection.

2. 15% of the applicable contract unit rate payable on system completion and area cleaning.

I D **An amount limited to 1.0 % of the contract value shall be payable in one or more installments**, solely at the discretion of Construction Manager/ BHEL at different stages of the contract execution to facilitate resource augmentation or to meet any exigency of work. In case of its non utilization 'OR' its part utilization, the entire/balance payment against this category shall be released along with commissioning of last boiler (Safety Valve Floating) against this contract.

II **MILESTONE PAYMENTS (12% of CV for Item No.1 of Rate Schedule of each unit)**

1 1.5 % of CV on successful completion of hydro test of each boiler.

2 1.5 % of CV on successful completion of air and gas tightness test of furnace / APH and ducts required for Boiler Light Up.

3 1.5 % of CV on successful completion of boiler light up.

4 2 % of CV on successful completion of trial run of ID, FD & PA fans completion, completion of milling system and commissioning of hoists and handling equipment for FD/ID/PA/MILLS

5 1.5 % of CV value on successful completion of steam blowing and SVF.

6 1.5 % of CV on coal firing operation.

7 2.5 % of CV on successful achieving full load and completion of trial operations.

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 up to 50% of milestone payment on completion of work, to the extent possible, required for carrying out that particular milestone / commissioning activity. Milestone Payments can be further split and released after ensuring consumerate completion and recording reason.

III **Providing and applying PAINTING-Payment on Prorata basis**

2 % of CV against SNO. 1 of rate schedule for providing and applying PAINTING on Prorata basis.

IV **2 % of contract value will be payable on handing over of the boiler to BHEL's Customer or 3 months after contractor has discharged his responsibilities as stipulated in this contract, whichever is earlier, if delay in handing over is not attributable to contractor. The boiler shall be considered as handed over on completion of trial operation.**

V **The balance 2 % of CV shall be payable on completion of all pending work, rework wherever required, area cleaning, reconciliation of materials, fulfillment of contractual obligations, and on submission and passing of Final Bill.**

NOTE: Payments at IV & V shall be released after adjustment of the CV based on actual work carried out.

"ANNEXURE-A"

DETAILED SCOPE OF WORK

1.0 : GENERAL

Broadly the following refurbishment works are to be carried out:

- Replacement / strengthening of Ceiling Girders.
- Replacement of deck supports and sealing.
- Replacement of boiler roof structure and sheeting.
- Replacement / servicing of Boiler Pressure Parts.
- Replacement of supporting structures and tie rods for headers, pipes etc.
- Buck stay dismantling / correction and re erection.
- Ash removal and cleaning of boiler prior to dismantling.
- Transfer of all important elevations to columns prior to dismantling.
- Replacement / repairing of Ducts.
- Replacement / servicing of Fuel Oil System.
- Replacement of Scanner Air System.
- Replacement of Coal Pipes.
- Replacement of Volumetric Coal Feeders with Dual Belt Gravimetric Feeders.
- Replacement of Wind Boxes.
- Servicing of Mill Seal Air System.
- Servicing of Air Pre Heaters.
- Servicing of FD and PA Fans.
- Replacement of ID Fans.
- Up rating / servicing of Bowl Mills.
- Replacement of Gates and Dampers.
- Replacement of Refractory and Insulation.
- Replacement / servicing of Piping systems.
- Replacement of Piping Hangers.
- Replacement / servicing of Valves.
- Application of Primer and Finish Painting.
- Transportation / segregation of dismantled items to the identified areas.
-

2.0 : STRUCTURES

2.1 : BOILER CEILING STRUCTURES AND CEILING GIRDERS

Following are the unit wise details of works for Boiler Ceiling Structures and Ceiling Girders:

2.1.1 : UNIT – 9

1. For unit no 9, the Ceiling Girder 'C' is to be replaced. For replacement of the Girder one No. of 300 MT capacity crane will be provided.
2. For remaining Ceiling Girders strengthening of girders to be carried out which can be done with girders in position. Materials and Drawings required for the strengthening will be provided.
3. Boiler Ceiling Structures at T. O. S. 58.064 M and between the Ceiling Girders 'B' & 'C' and 'C' & 'D' are to be dismantled along with the Pressure Part Hangers and Supports etc. to facilitate the replacement of Ceiling Girder 'C'. The same are to be restored once the replacement of the Girder is completed.
4. Temporary structures for supporting / arresting down comer, Riser Tubes, WW outlet headers, Final SH coils, Second Pass Walls, DESH links etc. are to be erected as per drawing and instructions by BHEL engineer.
5. Suitable interconnecting structural members at E', F & G rows of main columns from boiler left side to boiler right side at an elevation below existing ceiling girder (and above top most pressure part component) are to be erected.
6. Riser Tubes, WW outlet headers, Final SH coils and DESH links etc. are to be temporarily supported to these members before dismantling of Ceiling Structure.
7. Temporary structures are to be dismantled once the requirement is over.

2.1.2 : UNIT – 10

1. For unit no 10, replacements of Ceiling Girders are not required. Only strengthening of Girders to be carried out which can be done with Girders in position. Materials and Drawings required for the strengthening will be provided.

2.1.3 : UNIT – 11

1. For unit no 11, the Ceiling Girders 'B', 'C' & 'D' are to be replaced.
2. For remaining Ceiling Girders strengthening of girders to be carried out which can be done with girders in position. Materials and Drawings required for the strengthening will be provided.
3. Since girder 'B' is to be dismantled and replaced, temporary structures are to be provided to support the drum from bottom.

4. For replacement of the existing Ceiling Girders ‘B’, ‘C’ and ‘D’ one No. 300 MT capacity crane will be provided.
5. Boiler Ceiling Structures at T. O. S. 58.064 M and between the Ceiling Girders ‘A’ & ‘B’, ‘B’ & ‘C’ and ‘C’ & ‘D’ are to be dismantled along with the Pressure Parts such as WW outlet headers and DESH links, Hangers and Supports etc. to facilitate the replacement of Ceiling girder ‘B’, ‘C’ and ’D’. The same are to be restored once the replacement of Ceiling Girders is completed.
6. Temporary structures for supporting / arresting down comer, Riser Tubes, WW outlet headers, Final SH Coils, Second Pass Walls, DESH links etc. are to be erected as per drawing and instructions by BHEL engineer.
7. Suitable interconnecting structural members at E’, F & G rows of main columns from boiler left side to boiler right side at an elevation below existing ceiling girder (and above top most pressure part component) are to be erected as per drawing and instructions by BHEL engineer.
8. Riser Tubes, WW outlet headers, Final SH coils, Second Pass Walls and DESH links etc. are to be temporarily supported to above members before dismantling of Ceiling Structure.
9. Temporary structures are to be dismantled once the requirement is over.

2.2 : PLATFORMS, FLOOR GRILLS, TOE GUARDS, HAND RAILS,

1. Wherever required, the existing Platforms, Floor Grills, Toe Guards Hand Rails etc. are to be dismantled to facilitate the refurbishment works and are to be restored back once the refurbishment works are completed.

2. Existing Damaged Platforms, Floor Grills, Toe Guards Hand rails etc. are to be Repaired / replaced.

3. Apart from the existing ones, Wherever required, new Structures, Platforms, Floor Grills, Toe Guards Hand rails etc. are to be erected.

2.3 : BOILER ROOF STRUCTURE AND ROOF SHEETING

1. Replacement of Boiler Roof Structure and Roof sheeting is to be carried out.

2.4 : TEMPORARY STRUCTURES

1. Wherever required, Temporary Structures etc. are to be erected to facilitate the refurbishment works and are to be dismantled once the refurbishment works are completed.

3.0 : BOILER PRESSURE PARTS

The following are the item wise details of works to be carried out for Boiler Pressure parts:

3.1 : DRUM

Servicing of drum internals (or replacement if required) to be carried out. Drum internal piping (dosing, blow down, etc) is to be checked (NDT / DPT for weld joint) and to be repaired if required. Safety valves and other root valves are to be replaced. Safety valves, exhaust pipes, and supports are to be retained.

3.2 : DOWN COMER

Down Comer Pipes are not to be replaced. Only the DC pipes, Supports / hangers are to be inspected and serviced if required. All the down comers are to be arrested before start of dismantling of other boiler items.

3.3 : WW BOTTOM RING HEADER

WW Bottom Ring Headers are not to be replaced. The same are to be temporarily supported (bottom support) and arrested after cooling down of boiler and before start of dismantling of other boiler items. Headers' elevation (four sides) are to be transferred / marked to the columns.

Drain lines with valves are to be replaced and the existing routings are to be adopted.

WW panels are to be cut and dismantled leaving the stubs with headers (cutting to be done near existing joint in the panel portion), leaving some clearance for edge preparation. Weld joint location (Panel with header stub) is unchanged; hence stub length should not be reduced while dismantling. After dismantling of WW panels, stubs are to be covered to avoid entry of dust and foreign materials during dismantling / erection.

3.4 : FURNACE WALL

All the four sides of furnace wall (1st pass) including burner panels are to be dismantled and replaced with new one. WW outlet (top) headers are not to be replaced. However temporary dismantling may be required to facilitate the replacement of other boiler items WW panels are to be cut and dismantled leaving the stubs with headers (cutting to be done near existing joint in the panel portion), leaving some clearance for edge preparation. Weld joint location (Panel with header stub) is unchanged, hence stub length should not be reduced while dismantling. After dismantling of WW panels, stubs are to be covered to avoid entry of dust and foreign materials during dismantling / erection.

WW hanger tubes, screen tubes, rear arch tubes and extended WW panels will be supplied and to be replaced. Similar to WW, for these tubes also weld joint location

(with header stub) is unchanged hence stub length should not be reduced while dismantling (cutting to be done near existing joint, leaving some clearance for edge preparation).

WW top outlet headers are not to be replaced. However temporary dismantling / supporting / arresting may be required to facilitate the replacement of other boiler items. Headers' elevation are to be transferred / marked in the nearer columns.

3.5 : RISER TUBES & SUPPORTS

Unit No. 9 : Repair of damaged Riser Tubes and replacement of supports are to be done.

Unit no. 10 & 11 : 100% replacement of Riser Tubes if required, along with supports are to Carried out.

3.6 : ECONOMISER

Repairing / Replacement / addition of eco coils are to be carried out as per BHEL instruction / site condition. Existing economizer coils are of either 7 loop coils or 10 loop coils. In case of 7 loop coils the coils are to be converted to 10 loop coils by adding fresh 3 loop coils to the existing 7 loop coils. In case of 10 loop coils the coils are to be replaced by fresh 10 loop coils.

3.7 : SUPER HEATERS

3.7.1 : SATURATION LINE

Roof SH Inlet Header is to be replaced but the Saturation lines (drum to roof SH Inlet Header) are to be retained. Weld joint locations (Saturation lines with header stubs) is unchanged, hence line length should not be reduced while dismantling the Header. Cutting to be done near existing joint (in the header stub portion), leaving some clearance for edge preparation.

3.7.2 : ROOF SH

Ceiling SH Tubes and Headers (Inlet & Outlet) are to be replaced. Their hanger support assemblies are to be inspected, serviced / repaired / replaced (wherever required).

3.7.3 : STEAM COOLED WALL (2nd PASS)

Second pass wall, and extended steam cooled wall are to be retained. The walls are to be inspected and the damaged steam cooled walls are to be repaired. Loose tubes and fins will be supplied for repairing works of SCW. Bows in wall are to be corrected (hot correction or any suitable method to be used). However, second pass steam cooled roof and second pass steam cooled screen tubes are to be replaced. Buck stay beams are

to be re-fixed after bow correction, if required. Key buck stays (channels welded to wall) are to be replaced if required. Before starting of dismantling of second pass roof, second pass wall, extended water wall and headers are to be arrested and supported temporarily.

3.7.4 : STEAM COOLED WALL HEADERS

Inlet / Outlet headers of SCW, supports of SCW / headers and supply tubes of headers are to be retained. Headers' elevation (four sides) are to be transferred / marked in the nearer columns before starting of dismantling.

3.7.5 : LTSH

LTSH coils and outlet headers and terminal tubes are to be replaced. Their hanger supports are to be re-used.

LTSH inlet headers are to be replaced in unit 10 & 11 only if required.

Supply tubes for LTSH inlet header are not replaced. Inlet header should be supported before start of dismantling of LTSH coils. Weld joint location (LTSH coil with header stub) is unchanged; hence stub length should not be reduced while dismantling. Cutting to be done near existing joint (in the coil portion), leaving some clearance for edge preparation.

3.7.6 : DESH and LINKS

SH – De Super Heaters are to be replaced. But the Links between LTSH outlet headers and Platen inlet headers are not in the scope. Link pipes are in good condition but are found in inclined position (because of the sagging of Platen inlet headers). Links are to be re-erected in original position with supports.

3.7.7 : PLATEN SH

Platen SH inlet header, coils and outlet headers are to be replaced. Hanger supports of headers also are to be replaced. But the Links between Platen outlet headers and Final SH inlet headers are not in the scope. Link pipes are in good condition but are found in inclined position (because of the sagging of Platen outlet headers). Links are to be re-erected in original position with supports. Supports for links are to be replaced.

3.7.8 : FINAL SH

Final SH headers (inlet & outlet) are to be replaced for all the units. All the coils are to be replaced for units 10 & 11. For unit No. 9 only two nos. of coils are to be replaced. Weld joint location (SH coil with header stub) is unchanged, hence coil length should not be reduced while dismantling. Cutting to be done near existing joint (in the stub portion), leaving some clearance for edge preparation.

In unit 10 & 11, FSH coils which are found in good condition are to be dismantled with out damaging of coils and are to be preserved / stored for reusing.

Header's hanger supports are to be replaced. But for coils only damaged supports are to be replaced.

3.7.9 : RE-HEATERS

Re-heater's inlet and outlet headers are to be replaced in all the units. RH coils are to be replaced in all the units.

The coils supplied are to be slightly modified. Expansion loop (bend-approx 1.5M length) is to be provided in one of the circuits at header end. The same loop will be supplied as loose piece and to be fitted/welded at site for all the coils of RH coils.

3.7.10 : PRESSURE PART HANGERS

Hanger rod supports of these headers and WW headers are not to be replaced. However the hanger supports are to be inspected and serviced / replaced if required. 9 Nos. of hangers (for all these headers) per boiler will be supplied as erection contingency requirement and the same

3.7.11 : BUCK STAY (1st & 2nd PASS)

Before start of dismantling of WW panel, buck stay beams are to be removed from WW (without any damage to beams) and to be preserved for re-fixing. Bow correction (hot correction – if required) to be carried out for the Buck Stay Beams. Key buck stay channels and buck stay-fixing components / corner arrangements are to be replaced. Vertical buck stays are to be re-used.

3.7.12 : BOILER MOUNTINGS (Trim Piping: valves, drains, vents, spray / SB system)

Most of the valves are to be replaced. However servicing of balance valves are to be carried out by the contractor. Payment will be made to the contractor on the basis of tonnage quoted by Bidder for Erection work. No separate payment will be made for dismantling of these components which have to be reused. Following will be the scope for boiler mounting (Trim piping) area: -

1. All the valves (safety valves, ERV, isolation valve (GV) & NRV at eco inlet, spray station valves, SB control station valves, all the drain & vent valves, root valves at drum dished ends, IBD / CBD / Dosing valves, etc) in boiler area as per valve schedule / scheme will be replaced.
2. Super heater SV and ERV are to be replaced.

3. Existing exhaust pipes and silencer of all the safety valves will be retained.
4. MS stop valve will be retained, but its by-pass valve will be replaced with motor operated valve. Cabling to be done for this valve by using existing cables.
5. Drains and vents of WW, SH and RH will be replaced. Existing routing to be followed and no routing / erection drawings will be furnished.
6. Drain headers are to be retained.
7. Drains and vents valve locations can be retained or changed to suit site condition and as per customer requirements.
8. Sample coolers with lines and valves will be replaced. Sample coolers location to be finalized in consultation with BHEL (nearer to cooling water source and drain point). Existing routing to be followed for sampling lines and for cooling water line, routing to be done as per site condition.
9. Existing SH / RH spray control station to be dismantled and new spray station to be erected with pneumatic control / block valves. Spray station to be installed in the same location to suit the site condition. Reference drawings will be furnished.
10. Spray water inlet line (to station) to be replaced / modified.
11. Existing routing to be followed for spray lines and no routing / erection drawings will be furnished.
12. Soot Blowing piping, control station and drain station for all the units are to be replaced.
13. Wall Blowers are to be serviced. Commissioning spares (like gaskets, packing) will be supplied.
14. Wall blowers (partial quantity - approx. 20 Nos. per boiler) will be removed and replaced.
15. Wall blowers removed, need not be handed over to customer as scrap. They are to be stored safely and their components are to be reused while servicing work of other units / other blowers.
16. SB Control station and drain station are to be located to suit condition in consultation with BHEL / customer.
17. CBD and IBD lines are to be replaced. Dosing line will be replaced up to NRV at drum end.
18. Servicing of CBD and IBD tank to be carried out.
19. Servicing of HP / LP Dosing system to be carried out.

4.0 : BOILER NON PRESSURE PARTS

4.1 : DUCTS

Hot air ducts and flue gas ducts are to be replaced along with expansion joints and dampers / gates for all the units. Reference drawings will be furnished.

In cold air ducting system, repair / servicing work is to be carried out for duct portion. For carrying out servicing works, plates, channels angles etc. will be supplied in running meters. All the expansion joints and dampers / gates in cold air ducting system are to be replaced.

Cold bus duct had already been modified in unit 11 during mill up rating work. Similar modifications are to be carried out in unit Nos. 9 and 10 also. Materials (ducts) will be supplied for the same.

The PA opening of APH had been modified from 50^0 to 72^0 in all units except 10. For unit 10 this modification is to be carried out during R&M and cold air duct is also to be modified to suit the openings. Ducts will be supplied for the same.

For PA fan outlet existing dampers are to be replaced with gates. Hangers and supports of cold air ducts are to be serviced. However as erection contingency requirement, one unit support material will be supplied for using in all the three units. PA and FD fans' suction sides are to be serviced.

Existing cabling for gates / dampers is to be reused / realigned / retained.

5.0 : FUEL OIL SYSTEM

5.1 : FUEL OIL PIPING

Oil system piping in the boiler area alone along with valves is to be replaced. New oil station for boiler front (firing floor) and corner stations for all corners / elevations for LDO / HFO / Air / Steam are to be replaced. Locations of oil stations can be retained in the same place. Oil lines in firing floor and corner stations alone to be replaced. Oil guns for all the units are to be replaced. HEA igniters and scanners are to be replaced.

Oil line from pump house to boiler firing floor is to be retained / serviced / replaced along with insulation.

5.2 : FUEL OIL PUMPS

Oil unloading pumps, oil tanks, pumps and heaters are to be serviced. Payment will be made to the contractor on the basis of tonnage quoted by Bidder for Erection work. No separate payment will be made for dismantling of these components, which have to be reused.

6.0 : SCANNER AIR SYSTEM

Scanner air system with fans (A/C and D/C fans), dampers and ducts are to be replaced. Existing scanner and igniter fans are to be dismantled. Pipes for gun cooling and scanner cooling air are to be replaced. Existing routing for the above pipes is to be followed. However suction pipe for these fans from cold air duct to fans are to be retained. Fans can be erected in the same floor. Existing power cables are to be retained / reused / realigned. Payment will be made to the contractor on the basis of tonnage quoted by Bidder for Erection work. No separate payment will be made for dismantling of these components, which have to be reused.

7.0 : COAL PIPING

Coal Pipes are to be replaced along with bends and orifices in unit no 9 and 10. In unit no11 during mill up rating work, coal pipes had already been replaced, only ceramic bends and orifices are to be replaced in unit 11.

8.0 : WIND BOX

Wind boxes are to be replaced in all the three units along with tilting mechanism.

9.0 : FEEDERS

Existing Volumetric Feeders are to be replaced with Dual Belt Gravimetric Feeders for all the boilers. Coal feed pipe from bunker outlet to feeder will be replaced along with gate. Feeder outlet pipe (at feeder side and at mill side) is to be replaced. New seal air pipe for feeder from cold air duct and cooling water line are to be erected.

For new feeders, opening on existing concrete floor are to be made as per the new requirement.

To support the new feeders, additional beams are to be erected at / below feeder floor. For fixing of feeder on the concrete floor, holes are to be drilled suitably. Grouting to be carried out for fixing studs. Reference drawings will be furnished

10.0 : MILL SEAL AIR SYSTEM

Servicing of Mill Seal Air system is to be carried out. For feeder, the Seal air system is to be replaced. Existing seal air pipe to volumetric feeders is to be dismantled, and new seal air pipe and system from cold air duct is to be installed to suit gravimetric feeders. Payment will be made to the contractor on the basis of tonnage quoted by Bidder for Erection work. No separate payment will be made for dismantling and servicing of the components, which have to be reused.

11.0 : AIR PRE HEATERS

Overhauling / servicing of existing Rotary Air Pre Heaters (2 nos. per boiler) to be carried out. Payment will be made to the contractor on the basis of tonnage quoted by Bidder for Erection work. No separate payment will be made for dismantling and servicing of the components, which have to be reused. The following are the major jobs to be carried out:

1. Replacement of Radial Seal assembly.
2. Replacement of Cold and Hot End Heating elements with baskets.
3. Replacement of Hot End Sector Plates with Static Seal, Adjustor Rods, Spool Assembly and Tracking Rod.
4. Replacement of Cold End Sector Plates with Static Seal, Adjustor Rods and Spool Assembly.
5. Replacement of Axial Seal Assembly.
6. Replacement of Bypass Seal Assembly.
7. Replacement of Main Drive Speed Reducer.
8. Replacement of Guide Bearing.
9. Replacement of Support Bearing.
10. Servicing of Cleaning Device at gas outlet.
11. Servicing of Cleaning Device at drive unit.
12. Servicing of lube oil system.

12.0 : FANS

12.1 : FD Fans: Overhauling / servicing of FD fans, size AN 20 e 6 (2 Nos. per boiler) to be carried out (Fan housing to be retained). Payment will be made to the contractor on the basis of tonnage quoted by Bidder for Erection work. No separate payment will be made for dismantling and servicing of the components which have to be reused The following are the major jobs to be carried out:

1. Replacement of Shaft Assembly.
2. Replacement of Impeller Assembly.
3. Replacement of Flange Bearing with Bearing Housing Assembly.
4. replacement of External bearing and Bearing Housing assembly.
5. Replacement of Shaft seals.
6. Replacement of Expansion Joints.
7. Replacement of IGV Assembly.
8. Replacement of Coupling.

9. Servicing of FD Fan Motor.
10. Servicing of OGV to be done.
11. Servicing of Lube oil system.
12. Servicing of suction ducting.

12.2 : PA Fans: Overhauling / servicing of PA fans, size NDF 22 B (2 Nos. per boiler) to be carried out. Payment will be made to the contractor on the basis of tonnage quoted by Bidder for Erection work. No separate payment will be made for dismantling and servicing of the components which have to be reused The following are the major jobs to be carried out:

1. Replacement of Shaft Assembly.
2. Replacement of Impeller Assembly.
3. Replacement of Bearing with Bearing Housing Assembly.
4. Replacement of Shaft seals.
5. Replacement of Expansion Joints.
6. Replacement of IGV Assembly.
7. Replacement of Coupling.
8. Servicing of PA Fan Motor.
9. Servicing of Lube oil system.
10. Repair / Fabrication / Replacement of Impeller Sealing Ring.
11. Servicing of suction ducting

12.3 : ID Fans: Complete replacement of the existing ID Fans (except ID Fan Motor) with the new ID Fans, size AN 25 e 6 B (2 Nos. per boiler) to be carried out except fan motor. The ID Fan Motor is to be serviced. Payment will be made to the contractor on the basis of tonnage quoted by Bidder for Erection work. No separate payment will be made for dismantling and servicing of the components, which have to be reused. The following are the major jobs to be carried out:

1. Dismantling of existing ID Fans.
2. Servicing of existing motors.
3. Preparation of foundation and placement of foundation sole plates, shims and packers.
4. Erection of suction box, impeller housing, OGV, diffuser with access doors, drain plugs etc.
5. Erection of impeller with shaft and bearings.
6. Erection of flexible coupling with guard.

7. Erection of IGV controls.
8. Mounting of duplex RTD for remote indication and for alarm / trip contacts.
9. Mounting of Temperature gauges (Mist) for local indication.

13.0 : BOWL MILLS

Refurbishment and up rating of Bowl Mills (6 Nos. per boiler) (from XRP-763 to XRP-803) are to be done. Payment will be made to the contractor on the basis of tonnage quoted by Bidder for Erection work. No separate payment will be made for dismantling and servicing of the components, which have to be reused. Besides Overhauling, the following major jobs are to be carried out:

1. Replacement of Journal Head Liners.
2. Replacement of Bowl Extn. Ring Segments.
3. Replacement of Insulation Cover Plate Assembly Segment.
4. Replacement of Mill Side Bottom Liners
5. Replacement of Bowl.
6. Replacement of Mill Side Liners.
7. Replacement of Deflector Assembly (Hinge Shaft & Blade).
8. Replacement of Inner Cone (Ceramic lined Assembly).
9. Replacement of Outlet Venturi Assembly.
10. Replacement of Outlet Ventury Collar assembly.
11. Replacement of Set Journal Opening Frame Liner.
12. Replacement of Mill Motor Coupling.
13. Replacement of Centre Pipe (Upper) Assembly (S.S.).
14. Replacement of Lower Bearing & Pump Housing.
15. Replacement of Oil Pump Bushing.
16. Replacement of Deflector Assembly.
17. Replacement of MDV Assembly.
18. Replacement of Venturi Vane with Ceramic Liner.
19. Replacement of Mill Motors.

14.0 : GATES & DAMPERS

Most of the Gates and Dampers are to be replaced. However servicing of balance Gates and dampers are to be carried out by the contractor. Payment will be made to the contractor on the basis of tonnage quoted by Bidder for Erection work. No separate

payment will be made for dismantling and servicing of the components which have to be reused.

Existing cabling for gates / dampers is to be reused / realigned / retained.

15.0 : REFRACTORY & INSULATION

Broadly the following Insulation works are to be carried out:

- Complete Replacement of Refractory and wool Insulation to be done for all the areas of boiler like pressure parts, ducting, piping, etc.
- GI Sheets with fixing components for the outer casing are also to be replaced.
- Complete replacement of roof enclosures / bottom enclosure / rear arch enclosure is to be carried out.

16.0 : CRITICAL PIPING

Broadly the following Piping works will be carried out:

a. 100% replacement of MS, CRH and HRH Hangers and Supports.
b. CRH Header extension (both LH and RH).
c. 100% replacement of MS, CRH and HRH line insulation.
d. Replacement of insulation for Feed line, feed control station, spray line and PRDS system.
e. Replacement of Spray Water Piping from Feed line to isolation valve.
f. Replacement of FW Control Station Piping along with isolation valves, control valves, root valves, drain valves, impulse pipes, drain pipes etc.
g. Replacement of feed line Hangers and Supports.
h. Replacement of Piping from MS tap off to Aux. PRDS inlet including fittings, valves, safety valves, root valves, drain valves, impulse pipes, drain pipes etc.
i. Replacement of Aux. Steam Header for unit No. 10 and 11 along with drain valves, vent valves, root valves, impulse pipes, drain pipes, vent pipes etc.
j. Replacement of Thermo wells, Pressure Gauges, Direct Gauges and instrument fittings etc of the above systems.
k. Replacement of Drains and vents of the above systems.
l. Replacement of Control Valves of the above systems

17.0 : PAINTING

Application of minimum two coats of primer and two coats of finish painting of all the exposed surface is to be done as per BHEL specifications. Thickness measurement of the paint will be done and in case of less thickness, additional coats will be applied to achieve the required thickness.

OBRA 'B' (5 X 200MW) REFURBISHMENT

TENTATIVE SCHEDULE FOR ERECTION OF BOILER & AUXs.

ANNEXURE B

UNITS 9, 10 & 11

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
U# 9															
3194 MT		150	350	500	550	550	500	350	244						
U# 10															
3222 MT								150	475	600	600	600	500	297	
U# 11															
3404 MT									200	500	650	650	650	450	304
TOTAL		150	350	500	550	550	500	500	919	1100	1250	1250	1150	747	304

Total Wt. Of items to be erected for all the three units (#9,10 &11)is approx. 9820 MT

Legend:

DISMANTLING AND PREPARARORY WORKS

ANNEXURE C

OBRA 3X200MW BOILER R&M
TENTATIVE DETAILS OF JOINTS PER BOILER

SL.NO	DESCRIPTION	SIZE OF TUBE	NO.OF .JOINTS
01	WaterWallPanels	D63.5x5.2;SA210GrA1	2517
02	Screen&HangerTubes	D76.1x7.1;SA210GrA1	322

PG:10,11,12, 15,16,17 &19

For superheater system:
D127 x 12.5- SA 106 GR.B- 22 No.
D54X4.5- SA 210 GR.A1-- 360 No.
D51X4.5- SA210 GR. A1--1000 No.
D44.5X5.0--SA213 T11----1206 No.
D44.5X4.5--SA 213 T11---402 No.
D44.5X 4.0--SA 210 GR.A1--402 No.
D51X5.6-SA213 T11---29 No.
D51X7.6--SA213 T22---29 No.
D51X8.8--SA213 T22---29 No.
D51X10--SA 213 T22---116 No.
D51X5.6--SA 213 T11---29 No.
D51X4.5--SA 213 T11---174 No.
D47.63X8.6---SA213 T22---238No.
D47.63X7.1---SA213 T22---119No.
D47.63X6.6---SA213 T22---119 No.

D323.9X32---SA335 P12----10 No.
D323.9X45---SA335 P12----10 No.
D219.1X22.2--SA106 GR.B---10 No.
D273X36---SA 106 GR.B---6 No.
D127 X12.5--SA 106 GR.B---20 No

For Reheater system:
D54x4.5---SA209 T1----89 No.
D54x3.6---SA209 T1----445 No.
D54x4.5---SA213 T11---178 No.
D54x3.6--SA 213 T11---356 No.
D47.63x5.0---SA213 T22---356 No.
D54 x 4.5--SA213 T11---356 No.

For Economiser system:
D31.8x3.6---SA 210 Gr.A1----744 No.

For PG 21:

D21.3x4.78- SA335 P22- 1 No.
D33.4x6.35- SA335 P22- 1 No.
D21.3x2.77- SA106 GR. B- 10 Nos.
D33.4x3.38- SA106 GR. B- 30 Nos.
D60.3x3.91- SA106 GR. B- 625 Nos.
D88.9x5.49- SA106 GR. B- 4 Nos.
D60.3x8.3- SA105 - 1 No.
D60.3x8.74- SA335 P22 - 1 No.
D60.3x3.91- SA 106 Gr. B - 1 No.
D60.3x8.74- SA335 P22 - 3 Nos.
D33.4x6.35- SA335 P22 - 4 Nos.
D33.4x3.38- SA106 Gr. B - 40 Nos.
D60.3x3.91- SA106 Gr. B - 500 Nos.
D60.3x8.74 SA 335 P22 – 2 Nos.
D48.3x3.68 Sa234 WPB – 2 Nos.

For PG 24:

D158.8x41.3- SA105- 1 No.
D172.0x47.9- SA105- 2 Nos.
D209.6x28.6- SA105 - 3 Nos.
D209.6x28.6- SA182 F22- 1 No.
D172.0x47.9- SA182 F22- 1 No.
D139.7x39.7- SA182 F22- 1 No.
D139.7x39.7- SA182 F22 - 1 No.
D21.3x4.78 – SA106 Gr. B – 80 Nos.
D33.4x6.35- SA106 GR. B - 100 Nos.
D48.3x7.14- SA106 GR.B - 200 Nos.
D60.3x8.74- SA106 GR.B- 120 Nos.
D73.0x9.53- SA106 GR. B- 350 Nos.
D73.0x9.53- SA106 GR. B- 75 Nos.
D73.0x9.53- SA106 GR. B- 33 Nos.
D73.0x9.53- SA234 WPB- 1 No.
D108.0x16- SA106 GR. B - 10 Nos.
D108.0x16- SA106 GR. B – 10 Nos.
D168.3x40.0 - SA106 GR. B – 2 Nos.
D323.9x35- SA216 WCB – 1 No
D323.9x35- SA216 WCB – 2 Nos.
D73.0x9.53 - SA106 GR. B – 2 Nos.
D76.1x12.5 – SA213 T22 – 2 Nos.
D76.1x12.5- SA213 T22 – 30 Nos.
D57.0x10.0- SA213 T22 - 50 Nos.
D33.4x6.35- SA335 P22 – 50 Nos.
D21.3x4.78- SA335 P22 – 125 Nos.
D14.0x2.9- SA 182 F12 CL2 – 1 No.
D21.3x4.78 – SA105 – 85 Nos.
D33.4x6.35 – SA 106 Gr. B – 160 Nos.

D48.3x7.14 – SA 106 Gr. B – 150 Nos.
D60.3x8.74 – Sa 106 Gr. B – 24 Nos.
D21.3x4.78 – SA335 P22 – 60 Nos.
D33.4x6.35 – SA335 P22 – 50 Nos.
D57.0x10.0 – SA182 F22 – 4 Nos.
D14.0x2.9 – SA 182 F22 – 500 Nos.
D14x2.9 – SA182 F12 CL2 – 1 No.
D51.0x5.0- SA105 – 8 Nos.
D44.5x6.3 – SA 105 – 1 No.
D168.3x7.11- SA106 GR. B – 12 Nos.
D219.1x6.35- SA106 GR. B – 12 Nos.
D168.3x7.11- SA335 P22 – 4 Nos.
D219.1x8.0- SA335 P22 – 4 Nos.
D114.3x6.02- SA335 P22 – 4 Nos.
D323.9x6.35- SA106 GR. B – 3 Nos.
D273.1x6.35- SA106 GR. B – 3 Nos.
D48.3x3.68- SA106 GR. B – 6 Nos.
D48.3x3.68- SA106 GR. B – 24 Nos.
D73.0x7.01- SA106 GR. B – 30 Nos.
D21.3x4.78- SA335 P22 – 2 Nos.
D21.3x4.78- SA335 P22 – 10 Nos.
D48.3x3.68- SA335 P22 – 11 Nos.
D76.1x6.3- SA213 GR. T22– 12 Nos.

For Piping PG 80:

D33.4x4.55- SA106 Gr. B – 50 Nos.
D21.3x3.73 - SA 106 Gr. B – 11 Nos.
D60.3x11.07- SA 335 P22- 26 Nos.
D168.3x21.95- SA 106 Gr. B – 10 Nos.
D73.0x9.53- SA106 Gr. B – 7 Nos.
D114.3x13.49- SA106 Gr. B – 13 Nos.
D323.9x36.0- SA106 Gr. B – 37 Nos.
D273.0x9.27 – SA106 Gr. B- 15 Nos.
D558.8x40 – SA 106 Gr. C – 8 Nos.
D219.1x12.7 – SA 335 P22 – 9 Nos.
D114.3x17.12 – SA 335 P22 – 8 Nos.
D168.3x21.95 – SA 335 P22 – 10 Nos.

ANNEXURE – I PART I

DETAILS OF QUANTITIES

ESTIMATED WEIGHTS OF VARIOUS PRODUCT GROUP MAIN ASSEMBLY (PGMAs)

A MAIN BOILER

SL No.	PGMA	DESCRIPTION	DESIGN WEIGHT (KG) (Approx)		
			UNIT 9	UNIT 10	UNIT 11
1	04-136	Upper Drum Internals Only For Id 61-71	99.512	99.512	99.512
2	04-988	Drum Commisioning Spares	8.000	8.000	8.000
3	05-195	Inlet Platen Ww Header	3683.872	3683.872	3683.872
4	05-295	Outlet Platen Ww Header			0.000
5	06-400	Unclassified Burner Panel	21408.346	21408.346	21408.346
6	06-631	Front Upper Ww Pnl	23667.234	23667.234	23667.234
7	06-634	Front Intermediate Ww Pnl	23896.808	0.000	23896.808
8	06-637	Water Wall Lower Front Panel	23516.175	23516.175	23516.175
9	06-644	Rear Intermediate Ww Pnl	22492.493	22492.493	22492.493
10	06-647	Rear Lower Ww Pnl	23516.175	23516.175	23516.175
11	06-651	Side Upper Ww Pnl	49085.568	49085.568	49085.568
12	06-655	Side Lower Ww Pnl	35870.632	35870.632	35870.632
13	06-670	Extended Side Ww Pnl	7188.076	7188.076	7188.076
14	06-995	Platen WW Panel+HDR	22251.548	22251.548	22251.548
15	07-215	Relief Tubes From Side Wall Outlet Header	0.000	0.000	0.000
16	07-216	Relief Tubes From Rear Hanger Header	0.000	0.000	0.000
17	07-218	Relief Tubes From Front Outlet Header	0.000	0.000	0.000
18	07-223	Furnace Screen Tubes	16481.893	16481.893	16481.893
19	07-225	Furnace Rear Hanger Tubes	7411.100	7411.100	7411.100
20	07-226	Furnace Rear Arch Tubes	15258.484	15258.484	15258.484
21	07-231	Lower Corner Transition Tubes	1310.644	1310.644	1310.644
22	07-232	Upper Corner Transition Tubes	499.650	499.650	499.650
23	07-401	Water Wall Suspension	1258.624	1258.624	1258.624
24	07-431	Riser Tube Support	1735.228	1735.228	1735.228
25	07-500	Misc Components-Pressure Parts	284.950	284.950	284.950
26	07-501	Furnace Insert Tubes	1896.065	1896.065	1896.065
27	07-601	Pressure Seals	538.830	538.830	538.830
28	07-700	Bulked Bps Items For PG 04 to 07	198.996	0.000	0.000
29	07-992	Imported Electrodes	50.000	50.000	50.000
30	07-993	Consumable & Erection Materials	611.876	611.876	611.876
31	08-101	Furnace Upper Buck Stay	25246.733	25246.733	25246.733
32	08-104	Furnace Intermediate Buckstay	7350.060	7350.060	7350.060
33	08-107	Furnace Lower Buck Stay	2323.010	2323.010	2323.010
34	08-111	Furnace Rear Arch Buck Stays	1721.254	1721.254	1721.254
35	08-400	UNCL Furnace Guide	3000.000	3000.000	3000.000
36	08-700	Bulked BPS Items	408.000	408.000	408.000

37	08-900	Furnace Key Buckstays	20000.000	20000.000	20000.000
38	08-904	Windbox Connecting Duct Trusswork	2000.000	2000.000	2000.000
39	09-001	Seal Boxes For Furnace Opening	5300.000	5300.000	5300.000
40	09-002	Seal Box For Instrument Inserts	1300.000	1300.000	1300.000
41	09-003	Material For Instrument Inserts	181.861	181.861	181.861
42	10-135	Horizontal Spaced SH Inlet Header	0.000	6650.000	6650.000
43	10-174	Vertical Spaced Sh Centre Inlet Header	8150.860	8150.860	8150.860
44	10-178	Vertical Platen Sh 1nlet Header	4066.670	4066.670	4066.670
45	10-191	SH Radiant Wall Roof Inlet Header	2452.650	2452.650	2452.650
46	10-235	Horizntl Spaced Sh Outlet Header	5917.680	5917.680	5917.680
47	10-274	Vertical Spaced Sh Centre Outlet Heade	12074.050	12074.050	12074.050
48	10-278	Vertical Platen Sh Outlet Header	6782.760	6782.760	6782.760
49	10-291	SH Radiant Wall Roof Outlet Header	2498.850	2498.850	2498.850
50	11-236	Sh Hor Spaced Upper Coil + Atch	77048.780	77048.780	77048.780
51	11-237	SH Hor Spaced Inter Coil+Atch	88562.200	88562.200	88562.200
52	11-274	Sh Vertical Spaced Coil + Attachment	1165.420	69342.490	69342.490
53	11-278	Vert Platen Centre Sh Coil Assy+Attach	76628.730	76628.730	76628.730
54	11-616	Sh Rear Upper Panels	1744.500	1744.500	1744.500
55	11-686	Sh Roof Panels	2852.996	2852.996	2852.996
56	11-687	Sh Rear Roof Panels	8444.950	8444.950	8444.950
57	11-691	Sh Radiant Wall Roofpanels	15618.420	15618.420	15618.420
58	12-298	Blanking Component			0.000
59	12-535	Sh Hor Spaced Hanger	24007.500	24007.500	24007.500
60	12-803	Sh Steam Cooled Spacer Tube	815.808	815.808	815.808
61	12-805	Super Heater Hanger Tubes	9600.400	9600.400	9600.400
62	12-852	Blanking Component	324.400	700.000	700.000
63	12-900	Sh Desh	1750.780	1750.780	1750.780
64	12-903	Sh Miscl Components	23883.730	23883.730	23883.730
65	12-906	SH Suports for Links & Lines	3734.838	3734.838	3734.838
66	12-917	Suspention of Radial Roof	3291.460	3291.460	3291.460
67	12-944	Suspension Of SHH11 & SHH12	2122.620	2122.620	2122.620
68	12-948	Suspension Of Vertical Spaced Assembly	9618.016	9618.016	9618.016
69	12-968	Suspension of Row (D&E)	7812.071	7812.071	7812.071
70	12-992	Imported Electrodes	75.000	75.000	75.000
71	12-993	Consumables & Erection Materials	313.570	313.570	313.570
72	15-174	Reheater Vert Spaced Inlet Header RHH1	5789.470	5789.470	5789.470
73	15-274	Reheater Vert Spaced Outlet Header Rhh	7618.460	7618.460	7618.460
74	17-904	RH Hdr Suprts & Suspension Above Roof	4303.360	4303.360	4303.360
75	17-919	RH Front Suspension	3656.744	3656.744	3656.744
76	17-929	RH Rear Suspension	7436.336	7436.336	7436.336
77	17-992	Rh Site Electrodes Imported	63.500	63.500	63.500
78	18-001	Furnace Roof Skin Casing	9672.792	9672.792	9672.792
79	18-010	Pr Pts Attachments in Furn Roof Skn Cas	4792.690	4792.690	4792.690
80	18-020	Vibration Snubbers	171.310	171.310	171.310
81	19-114	Coils And Supports Of Upper P.Tube Ec	40899.240	161501.720	161501.720
82	19-992	Imported Electrodes	26.500	26.500	26.500
83	20-201	Wall Deslagger Rw5e	8300.000	9573.440	9573.440
84	20-204	Wall Box Assembly	1107.120	1107.120	1107.120

85	20-988	Commissioning Spares for Wall Blowers	20.100	20.100	20.100
86	21-600	Soot Blower Piping And Fittings	6839.036	6839.036	6839.036
87	21-601	Soot Blower Piping Supports	5168.802	5168.802	5168.802
88	21-700	Bulked BPS Components	812.415	812.415	812.415
89	21-800	Sb Valves (Bhel)	468.100	468.100	468.100
90	21-825	Sb Valves (Sub Delivery)	300.000	300.000	300.000
91	21-850	SB Safety Valve BHEL	23.000	23.000	23.000
92	21-987	Commg Spares SB SV	0.080	0.080	0.080
93	21-988	Commg Spares For Sub Deliveries	0.200	0.200	0.200
94	21-992	Imported Electrodes	48.895	48.895	48.895
95	24-200	Boiler Trim Piping And Fittings	19866.303	19866.303	19866.303
96	24-201	Trim Piping Supports	6388.447	6388.447	6388.447
97	24-220	Safety Valves Esc Pipe $ Drain RH UTY	4178.550	4178.550	4178.550
98	24-240	Sample Cooler And Supports	593.448	593.448	593.448
99	24-260	Valves (Bhel) Rh Uty Blr	7022.800	7022.800	7022.800
100	24-265	Valves & Fittings SD	5551.000	5551.000	5551.000
101	24-273	Direct Water Lvl Gag	247.574	247.574	247.574
102	24-280	Safety Valve & ERV-BHEL	2642.200	2642.200	2642.200
103	24-316	RH DESH	2979.840	2979.840	2979.840
104	24-700	Bulked BPS Components	209.874	209.874	209.874
105	24-955	Lap Tool SV&ERV	78.830	78.830	78.830
106	24-960	Lap Tool Con Val (BHEL)	44.250	44.250	44.250
107	24-987	BHEL-SV/ERV Commg Spare	1.570	1.570	1.570
108	24-988	Commg Spares For Imported Sub-Delay	3.600	3.600	3.600
109	24-989	Commg Spare for Convention Valves	9.272	9.272	9.272
110	24-992	Imported Electrode	19.775	19.775	19.775
111	24-994	Name Plates	224.774	224.774	224.774
112	28-220	Doors	4056.662	4056.662	4056.662
113	30-103	Seal Plate Assy	1701.632	1701.632	1701.632
114	30-105	Furnace Bottom Enclosure Framing	4807.286	4807.286	4807.286
115	30-211	Furnace Rear Arch Enclosure Framing	1812.964	1812.964	1812.964
116	30-212	Furnace Extd Side Bottom Enclosure Fra	7073.089	7073.089	7073.089
117	30-215	Main Boiler	3193.890	3193.890	3193.890
118	30-219	Vertical Roof Enclosure Framing	38901.468	38901.468	38901.468
119	30-220	Deck Support and Seals	19957.446	19957.446	19957.446
120	30-223	Gas Distribution Baffles	407.854	407.854	407.854
121	30-301	WATER WALL SKIN CASING	300.000	300.000	300.000
122	31-010	Skin Casing Comps Welded To Pressure P	2348.998	2348.998	2348.998
123	31-101	WATER WALL SKIN CASING	231.924	231.924	231.924
124	31-102	Fornace Bottom Skin Casing	892.792	892.792	892.792
125	31-104	Furnace Rear Arch Skin Casing	6372.262	6372.262	6372.262
126	31-105	Second Pass Skin Casing	1897.896	1897.896	1897.896
127	32-010	Fixing Comp For Blr Pr Parts Insul	5134.040	5134.040	5134.040
128	32-110	Fixing Comp For Blr Mountings Insul	1610.800	1610.800	1610.800
129	32-120	Fixing Comb For SB Pipes Insul	1202.000	1202.000	1202.000
130	32-310	Fixing Comp For Air Ducts Insul	12315.715	12315.715	12315.715
131	32-410	Fixing Comp For Ah And Gas Duct Insul	7291.080	7291.080	7291.080
132	32-710	Fixing Comp. For Oil System Insulation	1502.500	1502.500	1502.500

133	33-021	Blr Pr Parts Mineral Wool	50295.000	50295.000	50295.000
134	33-121	Boiler Mounting Mineral Wool	3575.000	3575.000	3575.000
135	33-126	Sb Pipe Mineral Wool	3025.000	3025.000	3025.000
136	33-212	Main Blr Castable Refractory Gr C	60438.780	60438.780	60438.780
137	33-230	Main Blr Pourable Insulation	100000.000	100000.000	100000.000
138	33-321	Mineral Wool	32500.000	32500.000	32500.000
139	33-421	Air Heater and Gas Ducts Mineral Wool	27125.000	27125.000	27125.000
140	33-721	Oil Sysstem Mineral Wool	3575.000	3575.000	3575.000
141	33-924	Misc Eqpts Asbestos Material	166.000	166.000	166.000
142	33-970	Misc Eqpts Expanded Metal	4438.000	4438.000	4438.000
143	33-971	Misc Eqpts Woven Wire Cloth	499.088	499.088	499.088
144	33-975	Misc Eqpts Sealing Compound	200.000	200.000	200.000
145	35-210	Boiler Ceilling Structure -Fabricated	80430.710	0.000	105000.000
146	35-220	Boiler Ceiling Structure-Rolled Beams	67416.289	0.000	68000.000
147	35-610	Boiler Roof Structure	56304.022	56304.022	56304.022
148	35-611	Boiler Roof Sheeting	26113.720	26113.720	26113.720
149	35-811	Floor Grills and Guard Plate	9292.670	9292.670	9292.670
150	35-851	Hand Raills & Post	5033.400	5033.400	5033.400
151	35-993	Consumable & Erection Material	7561.560	7561.560	7561.560
152	36-391	Miscellaneous Platform-Part-I	1231.719	1231.719	1231.720
153	37-010	Blr Outer Casing Components	13127.264	13127.264	13127.264
154	37-810	Blr Outer Casing	15302.923	15302.923	15302.923
155	38-410	Mill Maitanance Platform	3399.800	3399.800	3399.800
156	39-012	Foundation Material ID Duct Support	1741.484	1741.484	1741.484
157	39-100	Col Frames For Ducting Before ESP	56793.376	56793.376	56793.376
158	39-140	Col Frames Near ID Fan	25000.000	25000.000	25000.000
159	39-300	DUCT.SOPP.BEAMS	12647.830	12647.830	12647.830
160	39-301	FAN PLATFORMS	10796.389	10796.389	10796.389
161	39-810	Floor Grills and Guard Plate	6628.795	6628.795	6628.795
162	39-820	STAIRS & LADDERS	1494.660	1494.660	1494.660
163	39-850	Hand Rails And Posts	3211.936	3211.936	3211.936
164	41-350	Air Cooled Oil Gun Assy,	954.691	944.851	944.851
165	41-390	Oil Gun Vice Assy Rack	832.398	832.398	832.398
166	41-500	High Energy Arc Ignitor	269.460	269.460	269.460
167	41-988	Oil & Gas Burner Commissioning Spare	1.200	1.200	1.200
168	42-001	Penumatic Fittings	148.295	148.295	148.295
169	42-002	Steam Blow Materials	555.112	555.112	555.112
170	42-005	Instrument Fitting	235.962	235.962	235.962
171	42-150	Piping, Operating Floor Hfo & Tracer	3150.094	3150.094	3150.094
172	42-152	Piping,Opr'G Floor Lfo	819.010	819.010	819.010
173	42-157	Piping,Opr'G Floor Atm Air	960.271	960.271	960.271
174	42-158	Piping,Opr'G Floor Steam Ibr	2117.672	2117.672	2117.672
175	42-170	Piping, Oil Burner Fitting	1804.166	1804.166	1804.166
176	42-200	Subdelivery Fuel Oil System	1872.589	1872.589	1872.589
177	42-300	Bhel Valve F.O. System	486.240	486.240	486.240
178	42-358	Bhel Valve,Opr'G Floor Stm-Ibr	394.920	394.920	394.920
179	42-700	Bps Fasteners	237.949	237.949	237.949
180	42-988	Oil & Gas System Commissioning Spare	50.000	50.000	50.000

181	42-992	Imported Electrote	5.000	5.000	5.000
182	43-004	Assy Comp Scanner & Gun Air System	1486.442	1486.442	1486.442
183	43-005	Assy Comp Mill Seal Air System	299.220	299.220	299.220
184	43-104	M/C COMP SCANNER & GUN AIR SYSTEM	6494.230	6494.230	6494.230
185	43-105	M/C COMP MILL SEAL AIR SYSTEM	3557.400	3557.400	3557.400
186	43-200	Subdel,Ignitor&Scanner Air System	964.120	964.120	964.120
187	45-220	Wind Box Assembly 22-In Width	50189.866	50189.866	50189.866
188	45-221	Wind Box Support 22-In Width	3130.192	3130.192	3130.192
189	47-201	Fuel Piping Supports With 20-In Pipe	12991.411	12991.411	
190	47-203	Pipe Couplings Orifice & Misc Items	20686.280	20494.280	20494.280
191	47-209	St Pipes Shop Bends For Rest Of The Mi	134506.808	134506.808	134506.808
192	48-012	Rect Duct Bet F.D Fan And Airheater	620.922	2788.592	620.922
193	48-014	Expn Piecesbet F.D Fan And Airheater	1880.432	1880.432	1880.432
194	48-112	SQ. Ducts Pri Fan To Airheater Prisid	702.584	1226.500	1226.500
195	48-114	Expn Piecespri Fan To Airheater Prisid	702.584	702.584	702.584
196	48-132	SQ. Ducts Pri Air Fan ToColdairbusdu	5759.266	5759.266	5759.266
197	48-141	Seal Air Line For HAG	3585.480	3585.480	3585.480
198	48-144	Expn. Pieces Coldairbus(Temp Air to Mill	3047.712	3047.712	3047.712
199	48-200	Instrument Tapping Point	2838.967	2838.967	2838.967
200	48-202	Rect Ductsairheater To Windboxduct	33124.716	33124.716	33124.716
201	48-204	Expn Piecesairheater To Windboxduct	10822.160	10822.160	10822.160
202	48-205	Supportsetcairheater To Windboxduct	5064.316	5064.316	5064.316
203	48-207	Flowmeters For Secondary Air Flow	5548.760	5548.760	5548.760
204	48-212	Wind Box Connecting Ducts - Rectangula	22866.172	22866.172	22866.172
205	48-222	Rect Duct Air-heater Priside to hotair B	35010.222	35010.222	35010.222
206	48-224	Expn Pieces airheater prisidetohot air B	2650.224	2650.224	2650.224
207	48-225	Supports For Hot P.A(A.h to Hot Bus)	4193.490	4193.490	4193.490
208	48-382	Rect Duct Economiser To Airheater2nop	60375.428	60375.428	60375.428
209	48-384	Expn Pieceseconomiser To Airheater2nop	7077.800	7077.800	7077.800
210	48-385	Supportsetceconomiser To Airheater2nop	804.181	804.181	804.181
211	48-432	Rect Duct Air Heater Boiler Outlet-Gas	12472.446	12515.808	12515.808
212	48-434	Expn Pieces Air Heater Boiler Outlet-Gas	351.712	351.712	351.712
213	48-435	Support etc airheater Boiler Outlet-Gas	7627.442	7627.442	7627.442
214	48-662	Rect Duct Hot Air Bus To Mills	22841.538	22841.538	22841.538
215	48-664	Expn Pieceshot Air Bus to Mills	594.048	594.048	594.048
216	48-665	Support For Hot Pa to Mills	4678.588	4678.588	4678.588
217	48-667	Venturi Primary Air Flow	5765.160	5765.160	5765.160
218	48-700	Bulked BPS Components	2048.500	2048.500	2048.500
219	48-993	Erection Materials	5932.100	5932.100	5932.100
220	48-xxx	Gates and Dampers	60000.000	60000.000	60000.000
221	65-224	Dual Belt Gravimetric Feeder	29244.049	29241.049	29244.049
222	67-204	Needle Gate	2888.712	2888.712	2888.712
223	67-256	Coal Gate 24In Circ. Chain-Feeder Inlet	3815.514	3815.514	3815.514
224	67-801	Down Spout	11422.108	11422.108	11422.108
225	67-803	Feed Pipe to Mill	4352.820	4352.820	4352.820
226	95-088	Fsss Flame Scanner	175.000	175.000	175.000
227	95-089	Fsss Local Gun Maintenance Switch Box	50.000	50.000	50.000
228	95-091	Fsss Field Interconnecting Equipments	21633.900	21633.900	21633.900

229	95-092	Fsss Control Cables	31386.000	31386.000	31386.000
230	95-387	HEA Ignitor Components	0.000	0.000	0.000
231	95-485	Gravimetric Feeder Remote Power Cabine	2025.000	2025.000	2025.000
232	95-487	Gravi.Feeder Electronic Package	350.000	350.000	350.000
233	95-488	Feeder Mounting C&I Equipment			
234	95-495	Gravimetric Feeder Field Int.Con.Equpt	23000.000	23000.000	23000.000
235	95-988	Fuel Firing Control Commissioning Spare	200.000	200.000	200.000
236	96-186	SB Motor Control Centre	8000.000	8000.000	8000.000
237	96-187	Soot Blower Cables & Accesories	30000.000	30000.000	30000.000
238	96-189	Soot Blower Local Control Boxes	50.000	50.000	50.000
239	96-193	Miscellaneous Starter Box	250.000	250.000	250.000
240	96-485	AC Power distribution panel	500.000	500.000	500.000
241	96-486	DC Power distribution panel	0.000	0.000	0.000
242	96-487	Ac,Dc System Cables	5100.000	5100.000	5100.000
243	97-088	Elctronic Level Indicator	4.800	4.800	4.800
244	97-088	Elctronic Level Indicator	1410.740	1410.740	1410.740
245	97-195	EWLI Pressure vessel and accessories	256.914	256.914	256.914
246	97-196	Electrodes and Gaskets	6.120	6.120	6.120
247	97-196	Electrodes and Gaskets EWLI	1.530	1.530	1.530
248	97-282	Flowmeters	360.000	360.000	360.000
249	97-284	Field Gauges	196.000	196.000	196.000
250	97-285	Field Switches	50.000	50.000	50.000
251	97-287	Inst & Acc in steam & Water & SB System	45.500	45.500	45.500
252	97-297	Mtm Clamps And Pads	40.000	40.000	40.000
253	97-298	Mtm Thermo Couples & Junction Boxes	744.000	744.000	744.000
254	97-577	ERV Control Equipments	25.000	25.000	25.000
255	97-590	Erection Materials	40000.000	40000.000	40000.000
256	97-591	Miscellaneous Items	72.000	72.000	72.000
257	97-592	Pneumatic Tubings & Fittings,Airset	500.000	500.000	500.000
258	97-599	Pneumatic Actuator In Air&Flue Gas Sys	250.000	250.000	250.000
259	97-960	Face Cutter Tool for EWLI	1.840	1.840	1.840
		Total Wt of Main boiler	**2540964.871**	**2568630.766**	**2750371.494**

B AIR PRE HEATERS AND FANS

SL No.	PGMA	DESCRIPTION	DESIGN WEIGHT (KG) (Approx)		
			UNIT 9	UNIT 10	UNIT 11
1	52-013	LARGE AH-ROTOR SEALS	3450.000	3450.000	3450.000
2	52-024	COLD BASKET & ELEMENT	57590.160	57590.160	57590.160
3	52-025	HOT BASKET & ELEMENT	185971.080	185971.080	185971.080
4	52-041	HOT END CONN PLATE	9800.000	9800.000	9800.000
5	52-042	COLD END CONN PLATE	9710.000	9710.000	9710.000
6	52-054	LARGE AH-AXIAL SEALS	200.000	200.000	200.000
7	52-055	LARGE AH-BYPASS SEALS	780.000	780.000	780.000

8	52-261	LARGE AH-GUIDE BEARING	159.700	159.700	159.700
9	52-262	LARGE AH-SUPPORT BEARING	1120.000	1120.000	1120.000
10	55-000	AXIAL FAN TOOLS & FIXTURE	300.000	300.000	300.000
11	55-021	AXIAL ID FAN FOUNDATION MATERIALS	2000.000	2000.000	2000.000
12	55-027	ID FAN C&I ITEMS	100.000	100.000	100.000
13	55-114	IMPLS FD FAN 1600-2000	13500.000	13500.000	13500.000
14	55-125	IMPLS ID FAN 2000-250	43000.000	43000.000	43000.000
15	55-810	AXIAL FD FAN COUPLING	600.000	600.000	600.000
16	55-820	AXIAL ID FAN COUPLING	1000.000	1000.000	1000.000
17	56-135	PA FAN BC 182000-2500	18000.000	18000.000	18000.000
18	56-830	RADL PA FAN COUPLING	800.000	800.000	800.000
		Total Wt of APH and Fans	**348080.940**	**348080.940**	**348080.940**

C BOWL MILLS

SL No.	DESCRIPTION	DESIGN WEIGHT (KG) (Approx)		
		UNIT 9	UNIT 10	UNIT 11
1	Journal Head Liners.	1500.000	1500.000	1500.000
2	Bowl Extn. Ring Segments.	1000.000	1000.000	1000.000
3	Insulation Cover Plate Assembly Segment.	2500.000	2500.000	2500.000
4	Mill Side Bottom Liners	2700.000	2700.000	2700.000
5	Bowl.	13070.000	13070.000	13070.000
6	Mill Side Liners.	2500.000	2500.000	2500.000
7	Deflector Assembly (Hinge Shaft & Blade).	20000.000	20000.000	20000.000
8	Inner Cone (Ceramic lined Assembly).	6000.000	6000.000	6000.000
9	Outlet Venturi Assembly.	1800.000	1800.000	1800.000
10	Outlet Ventury Collar assembly.	1500.000	1500.000	1500.000
11	Journal Opening Frame Liner.	28200.000	28200.000	28200.000
12	Mill Motor Coupling.	720.000	720.000	720.000
13	Fasteners & Misc. Items	450.000	450.000	450.000
14	Centre Pipe (Upper) Assembly (S.S.).	1500.000	1500.000	1500.000
15	Lower Bearing & Pump Housing.	2400.000	2400.000	2400.000
16	Oil Pump Bushing.	70.000	70.000	70.000
17	Deflector Assembly.	600.000	600.000	600.000
18	MDV Assembly.	24000.000	24000.000	24000.000
19	Venturi Vane with Ceramic Liner.	200.000	200.000	200.000
20	Mill Motors.	30000.000	30000.000	30000.000
	Total Wt of Bowl Mills	**140710.000**	**140710.000**	**140710.000**

D PIPING

SL No.	PGMA	DESCRIPTION	DESIGN WEIGHT (KG) (Approx)		
			UNIT 9	UNIT 10	UNIT 11
1	80-303	AUX PRDS STATION PIPING	1537.491	1537.491	1537.491
2	80-320	CRH FROM TURBINE TO REHEATER	2818.550	2818.550	2818.550
3	80-340	AUX STEAM HEADER		1336.000	1336.000
4	80-418	ERECTION MATERIALS FOR INST	399.719	67.000	67.000
5	80-425	BFD CPNTROL STATION PIPING	11193.985	11193.985	11193.985
6	80-431	AUX PRDS CONTROL STATION PIPING	1437.761	1437.761	1437.761
7	80-452	HP PIPING DRAINS - SG SCOPE	1180.700	1180.700	1180.700
8	80-453	LP PIPING DRAINS - SG SCOPE	505.440	505.440	505.440
9	80-901	SUB DELIVERY VALVES FOR LIGHT UP	2000.000	2000.000	2000.000
10	80-905	BHEL VALVES FOR LIGHT UP	11157.000	11157.000	11157.000
11	80-923	H & S FOR STEAM BLOWING	27338.436	27338.436	27338.436
12	80-992	IMPORTED ELECTRODES	11.863	11.863	11.863
13	81-300	FIX COM FOR MAIN STEAM PPG INSL	7370.649	7370.649	7370.649
14	81-327	LBM	85233.000	85233.000	85233.000
15	81-341	SEALING COMP FOR INSL	170.000	170.000	170.000
16	31-350	AL CLADDING FOR INSL	11670.870	11670.870	11670.870
17	81-412	DIRECT GAUGES FOR NON STEAM LINES	15.000	15.000	15.000
		Total Wt of Piping	**164040.464**	**165043.745**	**165043.745**

GRAND TOTAL (Boiler+APH & Fans+Mills+Piping)	**3193796.275**	**3222465.451**	**3404206.179**

GRAND TOTAL FOR THREE UNITS= 9820467.905

NOTES:

1. **Besides product groups indicated herein, there is likelihood of addition of new product groups by BHEL's unit for release of some items, integral to this work. Tenderers' quoted unit rates shall be applicable for such product groups also.**

2. **BHEL's decision with regard to classification of a particular product group is binding on the contractor.**

3. **Besides the above, weight of all temporary piping, valves, pumps, tanks and other miscellaneous equipments etc. for carrying out hydraulic test, steam blowing and other tests, as stated elsewhere will get added. Those will be categorized as NPP and payment will be made for erection & commissioning only(as rate / MT)and no payment will be made for dismantling and return to site to site store. The tonnage calculated by BHEL engineer is final and binding to the contractor.**

4. **Electrical & C&I items of handling system (PG99) is excluded from the scope of work.**

5. **The weights indicated in above schedule are approximate only and are liable to variations and alterations.**

ANNEXURE I PART II

OBRA 3X210MW BOILER R&M
BREAKUP OF DISMANTLING

Sl No.	Description	%
1	Water Walls	10
2	Buck stays, Seal Boxes and Doors	2
3	SH Headers	2
4	LTSH	10
5	Platen Coils	2
6	Steam Cooled Walls and roofs	1
7	Pressure Part Suspensions	1
8	RH Headers and RH Suspensions	1
9	Skin Casing	1
10	Soot Blower System	1
11	Trim Piping	2
12	Seal Plates and Enclousures	1
13	Vertical Roof Enclousure and Deck	2
14	Ceiling Structure	5
15	Roof Structure and Sheeting	2
16	Boiler Outer casing	1
17	Oil, Scanner Air, and Mill Seal Air Systems	1
18	Wind Boxes	2
19	Coal Piping	5
20	Ducts	10
21	Feeder	2
22	APH	8
23	ID, PA and FD Fan Systems	3
24	Bowl Mills	5
25	Piping system	10
26	Other Misc. items	10
	TOTAL	**100**

Annexure-II

☆ LIST OF T&Ps BEING PROVIDED BY BHEL FOR USE OF CONTRACTOR FREE OF HIRE CHARGES ON SHARING BASIS AS PER REQUIREMENT.

SL NO	EQUIPMENT	QUANTITY
1	Crane 300 (For ceiling girder) / 150 / 100T Capacity	01 no.
2	Crane 55 MT	01 no.
3	Hydra Crane 12/14 T	01 no.
4	Motorised Hydraulic Test Pump	01 no.
5	Maintenance platform	01 no.
6	Chemical cleaning setup by EDTA/chemical cleaning process	By BHEL agency

NOTE:

1. Any other special T&P if supplied by the manufacturer will also be provided to the contractor free of hire charges as and when made available for work. Special tools and tackles are to be used only for the purpose for which these are meant and to be returned in good condition.

2. The operation and maintenance of 300/150/100 T crane shall be carried out by BHEL/Agency. However fuel for operation of crane shall be provided by the contractor at his cost. The lubricant will be issued free by BHEL.

3. Any other special IMTE's if supplied by the manufacturer will also be provided to the contractor free of hire charges as and when made available. Special IMTE's are to be used only for the purpose for which these are meant and to be returned in good condition.

4. Contractor has to LIFT the ceiling girders as per SCC Cl no.55.

5. Other terms and conditions regarding above items shall be as per Clause No.37 (T&P/IMTE's).

ANNEXURE-III
PART 1

☆ INDICATIVE LIST OF MAJOR T&P'S TO BE PROVIDED BY CONTRACTOR FOR EXECUTION OF TENDERED WORKS FOR MOST DURATION OF THE CONTRACT UNLESS OTHERWISE SPECIFIED.

SL NO	EQUIPMENT	QUANTITY
1	Mobile Crane 18 / 20 MT	1 no// As per requirement
2	Hydra Crane 12 / 14 MT	1 no/ / As per requirement
3	Trailer with pulling unit 15 / 20 MT	1 no// As per requirement
4	Trailer with pulling unit 10 / 15 MT	1 no// As per requirement
5	Electric Winch 2/3/5 MT	20 nos / As per requirement
6	Welding sets with accessories and ovens for electrodes baking and holding (covering manual/semi automatic/automatic processes	Minimum 30 nos / As per requirement
7	Computers with peripherals	Minimum 2 sets
8	Torque wrench of adequate capacity	As per requirement
9	Fire fighting equipment	As per requirement

NOTES:

1. The above list specifies only major T&P & IMTE's (may not be complete) to be deployed by the contractor as per the work requirement. All additional IMTE's / other tools and plants including suitable capacity D shackles, slings, rails sleepers hydraulic / mechanical jacks etc which are required for satisfactory & timely completion of work shall also be deployed by the contractor within finally accepted rate / price.

2. Sleepers, rails, jacks, winches, trailor etc required for unloading and shiftimg of heavy consignment are also to be arranged by contractor at his own cost. Other terms and conditions regarding above items shall be as per clause no 37 (Tools & Plants/IMTE).

ANNEXURE-III
PART II

INDICATIVE LIST OF MAJOR IMTEs TO BE PROVIDED BY CONTRACTOR FOR EXECUTION OF TENDERED WORKS FOR MOST DURATION OF THE CONTRACT

SL NO	EQUIPMENT	QUANTITY	
		PART- A	
1	HAND OPERATED MEGGER 500 / 1000 V	As per requirement	
2	TONG TESTER 10,20 OR 50 Amp + / - 3 % ACCURACY	As per requirement	
3	DIGITAL MULTIMETER	As per requirement	
4	ANALOGUE MULTIMETER	As per requirement	
5	6 / 12 Point temperature recorder (0 to 1000 degree C) for stress relieving including thermocouples, cables etc	Minimum Six Nos./As per requirement	
6	'U' TUBE MANOMETER 0-2000 MM WATER COLOUM	As per requirement	
7	INCLINED MANOMETER 0-50 MM WATER COLOUMN	As per requirement	
8	BOLT TENSION CALIBRATOR	As per requirement	

NOTES:

1. The above list specifies only major IMTEs (may not be complete) to be deployed by the contractor and is based on minimum requirement. All additional / other IMTEs/MMDs which are required for satisfactory & timely completion of work shall also be deployed by the contractor within finally accepted rate / price.

2. Other terms and conditions regarding above items shall be as per clause no 37 (Tools &Plants/IMTE).

ANNEXURE – IV

TERMINAL POINTS & EXCLUSIONS

TERMINAL POINTS.

1) Up to BOILER outlet flanges and rotary machines (matching flanges included in contractor's scope)

EXCLUSIONS:

The following are excluded from the subcontractor's scope:-

ESP, ducts from Bolier Outlet flange to chimney column foundation, equipment foundation.

Note:

The aforesaid exclusions should not be construed as exhaustive. They are meant for general guideline. BHEL reserves the right to include or exclude any item which is required for completing the job as per rates indicated in rate schedule. Contractor should carry out all such jobs as per the instructions of BHEL engineer.

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, wage structure, Industrial climate and total 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.

Tenderers Name and Address

Place: (Signature of the Tenderer 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 may 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 Contract Value (Tentative) Based on Rate Schedule/BOQ".
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, can not 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 OF UNDERTAKING
(To be submitted in the bidder's letter head)

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

Sub.: Work of "DISMANTLING OF SPECIFIED ITEMS UPTO BOILER OUTLET FLANGE, ROTARY PARTS, ERECTION/RE-ERECTION, OVERHAULING, TESTING, COMMISSIONING AND HANDING OVER OF BOILERS OF 3 X 200 MW UNITS NO. 9,10 &11 AT UPRVUNL OBRA 'B' TPS, OBRA (UP)".

Dear Sirs,

With reference to above, this is to confirm that as per tender conditions, we have visited Obra 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)

RATE SCHEDULE -- BOILERS (UNITS 9,10 & 11)

OBRA TPS R&M (3X200 MW UNITS)

Sl. No	DESCRIPTION OF WORK	Rate/MT in Rupees (In figures and words)	TOTAL VALUE (AMOUNT) in Rupees (In figures and words)
	WORKS		
1	Rate in Rupees per MT for handling, erection, painting, testing, commissioning, trial operation and handing over of 3 units 200 MW BOILER package(for works as **detailed in Annexure – I PART I**) including auxiliaries, insulation, electrical, controls and instrumentation, etc as per tender specifications.		
A	UNIT 9 (APPROX WT 3195 MT)		
B	UNIT 10 (APPROX WT 3220 MT)		
C	UNIT 11 (APPROX WT 3405 MT)		
Sl. No	**DESCRIPTION OF WORK**	**Lumpsum Rate Rupees (In figures and words)**	**AMOUNT (LS) in Rupees (In figures and words)**
2	LUMPSUM Rate in Rupees for dismantling items of 3 units 200 MW BOILER package(for breakup as **detailed in Annexure – I PART II**)		
A	UNIT 9 (APPROX WT 3400 MT)		
B	UNIT 10 (APPROX 3400 MT)		
C	UNIT 11 (APPROX WT 3700 MT)		

NOTES:

1. **The quantities indicated against each item above are tentative and these are liable to vary depending upon the site requirement. The contractor has to handle / erect / commission all items indicated by BHEL Engineer for achieving unit wise milestone and completion of work.**

2. PLEASE NOTE THAT RATE SCHEDULE ARE TO BE SUBMITTED IN SEPARATE SEALED ENVELOPE.

3. The bidders shall enter both 'Unit Rate' & 'Amount'. In case of any mismatch between 'Total Amount based on Unit Rate' & 'Total Amount as quoted', the higher of the two shall be considered for evaluation but work , if awarded, shall be on the basis of lower of the two quoted.

4. The rate shall be entered in figures as well as in words. In case of difference in rates between words and figures, the lesser of the two will be treated as valid rate

5. In case of omission in quoting any rate, the evaluation will be done considering the highest quoted rate obtained against that item. But the work, if awarded, will be on the lowest quoted rate obtained against that item.

6. **The contractor while quoting the price / rates as above, categorically confirms having understood the fullest implications of the price variation provisions of this tender. Accordingly, taking into considerations all aspects thereof, quoted the above rates.**

(Seal and Signature of Tenderer)