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

TENDER NO. BHEL:PSNR(SCT): DHOLPUR:HRSG:336

FOR

Erection, testing, commissioning and trial operation of 2 x 182 TPH HRSG (including 70 M high steel chimney) with related auxiliaries at Combined Cycle Power Plant of M/s Rajasthan Rajya Vidyut Utpadan Ltd (RRVUNL) at Dhoulpur, Rajasthan.

PART I – TECHNICAL BID

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

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

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

TENDER NO. BHEL:PSNR(SCT): DHOLPUR:HRSG:336

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
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TENDER NOTICE

Sealed tenders are invited from the contractors fulfilling qualifying requirements for the "erection, testing, commissioning and trial operation of 2 x 182 TPH HRSG (including 70 M high steel chimney) with related auxiliaries at Combined Cycle Power Plant of M/s Rajasthan Rajya Vidyut Utpadan Ltd (RRVUNL) at Dhoulpur, Rajasthan."

TENDER NO. BHEL:PSNR(SCT): DHOLPUR:HRSG:336

QUALIFYING REQUIREMENTS:

" Tenderer who wish to participate should have carried out during the last five years, erection and commissioning work of atleast one Steam Generator of 67 MW or higher rating unit or alternatively atleast two HRSGs of 100 TPH or higher rating units. Party should also have an average annual financial turnover of minimum of Rupees 225 lacs during last three years (2002-03, 03-04 and 04-05)".

NOTES:

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

(ii) Tender Documents with complete details are hosted in this web page. Bidder(s) intending to participate may download the tender document from the web site. Bidder(s) downloading the tender documents from the web site, shall remit Rs.1000/- (Rupees One thousand only) in the form of crossed demand draft (non-refundable), in favour of BHEL, NOIDA along with their offer

(iii) Bidder(s) can also purchase hard copy of tender documents from this office. Tender documents (non transferable) will be issued on all working days between 09.30 Hrs. to 12.30 Hrs within the sale period i.e ***upto* 26.05.2006** on payment of Rs.1,000/- (non-refundable) either in cash or by crossed demand draft in favors of BHEL, NOIDA. Request for issue of tender document should clearly indicate Tender No. and work.

(iii) Tenders must be submitted to the undersigned **latest by 26.05.2006** before opening of technical bids commences. Technical bids shall **be opened at 15.30 Hrs. on 26.05.2006**.

(iv) 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.

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

(vi) 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.

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

(viii) BHEL takes no responsibility for any delay/loss of documents or correspondences sent by courier/post.

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

AGM/SCP

ISO 9001-2000, ISO 14001 and OHSAS 18001 certified company
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DOMESTIC NOTICE INVITING TENDER

LAST DATE OF SALE : 26.05.2006
DATE OF OPENING : 26.05.2006

NIT NO. / NAME OF WORK
TENDER NO. BHEL:PSNR(SCT): DHOLPUR:HRSG:336 **Sealed tenders are invited from the contractors fulfilling qualifying requirements for the "erection, testing, commissioning and trial operation of 2 x 182 TPH HRSG (including 70 M high steel chimney) with related auxiliaries at Combined Cycle Power Plant of M/s Rajasthan Rajya Vidyut Utpadan Ltd (RRVUNL) at Dhoulpur, Rajasthan."**

NOTES

1. Purchase Preference will be given to CPSU as per Govt. Guidelines.
2. Please visit our website at www.bhel.com for details of NIT including Qualifying Requirements.
3. 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.

AGM/SCP

SYNOPSIS

DHOLPUR Combined Cycle Power Project

Rajasthan Vidyut Utpadan Nigam Limited (RRVUNL) is setting up 330 MW CCPP AT DHOLPUR (RAJASTHAN).

The site location is 54 KM from AGRA and 60 KM from GWALIOR. This is first power plant in this area. DHOLPUR is on NEW DELHI- BHOPAL rail line and midway of AGRA and GWALIOR.

All dispatches are expected by road, as there is no railway siding available.

SCOPE for BHEL

Engineering, Manufacture, Supply, Transportation, Storage ,Erection & Commissioning of 2 GTs, 2 HRSGs & I STG.

Tenderers are advised to visit and acquaint themselves with site conditions before quoting. No compensation, whatsoever, shall be entertained on this account.

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Power Sector – Northren Region,
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PROCEDURE FOR SUBMISSION OF SEALED TENDERS:

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

TECHNICAL BID (COVER-I)

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

PRICE BID (COVER-II)

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

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

SECTION-III (PART-A)

SPECIAL CONDITIONS OF CONTRACT

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SECTION-III (PART-A)

SPECIAL CONDITIONS OF CONTRACT

34.0 GENERAL

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

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 effected 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 of all types of labour, supervisors, Engineers, watch and ward as required, tools & tackles, calibrated inspection, measuring and test equipment as specified and otherwise required for the work and consumables for erection, testing and commissioning including material handling.

(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 performances of equipment.

(e) Repair and rectification.

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

34.5 BHEL-Power Sector (NR) is ISO 9001-2000, ISO 14001 and OHSAS 18001 certified company and has been recommended for SA 8000 certification. Work quality to customer's satisfaction, system requirements, health, safety & environmental protection are the basic essence of this certification. The contractor in all respects will organize his work, systems, process control documentation, T&P, inspection, measuring and testing equipment etc. Meeting above requirements as per instructions of BHEL engineer. The contract 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.

Besides the above, technical clearances from respective statutory bodies for the above shall be obtained by contractor at their cost to meet regulatory/statutory requirements.

34.6 Social Accountability:

(a) The contractor shall not employ any employee less than 15 years of age in pursuant to ILO convention. If any child labour were found to have been engaged , the Contractor shall be levied with expenses of bearing his education expenditure which will include stipend to substantiate appropriate education or employ any other member of family enabling to bear the child education expenditure.

(b) The contractor shall not engage Forced/Bonded Labour and shall abide by abolition of Bonded Labour System(Abolition) Act, 1976.

(c) The contractor shall maintain Health & safety requirement as stipulated in the Contract and Contract Labour(Regulation & Abolition) Act,1970.

(d) The Contractor shall abide by UN convention w.r.t Human Rights and shall be liable for Discrimation / Corporal punishment for failure in meeting with relevant requirements.

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

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

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

34.7 The customer M/s. RRYUNL may depute their representative for checking and supervision of important stages of work. The contractor shall be required to provide all facilities for inspection of works at no extra cost to BHEL. Any defect in quality of work or deviations from drawings / specifications pointed out during such inspection shall be made good by the contractor in the same way as if pointed out by the BHEL Engineer, without any cost implication to BHEL.

Tenderer may note that as the place of work is inside RRVUNL premises, being manned by their Security all necessary system related to entry of men, vehicle & material, safety & security systems, work permit system etc. as applicable will have to be followed by the contractor.

35.0 FOUNDATIONS AND GROUTING

35.1 Foundation for all equipment and steel structure and necessary civil works, including grouting shall be provided by Customer. The dimensions and locations of the foundations, pockets, anchor bolt pitch shall be checked by the contractor for their correctness as per drawings. The top elevation of foundations shall be checked with respect to bench mark etc. All minor adjustments of foundation level, dressing and chipping of foundation surfaces up to 50mm, enlarging the pockets in foundations etc., increasing the existing floor opening for cable entry, fixing panels and repair of same as may be required for the erection of equipment / panels shall be carried out by the contractor within the tonnage rate.

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 it is allowed by BHEL Engineer. The embedded sub sole plates shall be corrected and checked with Prussian blue to get the required level and contact with frames.

35.3 The contractor shall ensure perfect matching of structure/ equipment, 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 structural column and equipment to the satisfaction of BHEL Engineer. BHEL at its discretion can accept rough chipping of foundations, embedding packer plates in cement mortar etc.

35.4 The contractor shall arrange for grouting of foundation bolt holes of structure / equipment including complete encasing of equipment bases as specified in the drawings / specification or as advised by Engineer after preparing foundation top surface for grouting. Rotating auxiliaries foundation bolts / bases to be grouted only by Pedigrout M10 or equivalent as specified by BHEL. Static equipment foundation bolt and base to be grouted by Portland cement. All the arrangement required for grouting including supply of Pedigrout M10/ portland cement, sand, pea gravel and any other material required for grouting, shuttering, nails, wires etc., shall be arranged by the contractor at his cost. The grouting material shall be got approved by the contractor from BHEL Engineer.

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

35.6 All the matching joints which are not to be grouted shall be kept free from the grouting mixture by applying tape or any other alternative method approved by Engineer.

35.7 The contractor shall prepare the required test pieces / cubes to ensure the strength of the grout and get the same tested in laboratory at his cost as directed by BHEL Engineer before grouting. Test cubes shall also be taken during grouting for testing in the laboratory and shall be tested at Contractor’s cost.

35.8 After the grouting, the foundations are to be cured by contractor to the satisfaction of Engineer. The contractor shall check and verify the alignment of equipment, 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.

35.7 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.

36.0 CONSUMABLES

36.1 The contractor shall provide within finally accepted rates, all consumables like gaskets for temporary work, gland packing, all welding electrodes (including alloy steel and stainless steel), TIG filler wires (over & above as supplied by the unit along with the plant materials, which will be given free of cost to bidder), all inert / welding & cutting gases, soldering material, dye penetrates, radiography films, tapes, jointing compound, grease, mobile oil, M-seal, Molecote Areldite, petrol / other cleaning agents, wooden sleepers, steel required for temporary works such as platforms, scaffoldings, ladders, lapping compound, sealing compound etc., required for completion of work except those which are specifically supplied by manufacturing unit.

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

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

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

36.7 In case of improper arrangement for procurement of any consumable, BHEL reserves the right to procure the same from any source and recover the cost from the Contractor's first / subsequent bill at market value plus the departmental charges of BHEL as applicable 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.

36.8 All lubricant and chemicals required for cleaning, pre-commissioning, commissioning, testing, preservation and lubricants for trial runs of the equipment shall be supplied by BHEL. All services including labor 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

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

37.0 TOOLS AND PLANTS / IMTES

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

37.2 Besides the T&P 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 at his own cost. Contractor 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 and IMTE including cranes being provided free of hire charges shall be in the scope of the contractor. The contractor shall arrange at his own cost, trained operators, fuel and other consumables for the operation. All lubricants for these cranes such as mobile 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 of such items well in advance .

37.6 The contractor shall engage trained and experienced operators for the operation of BHEL's T&Ps. Their skill / performance will be checked by BHEL Engineer before they are allowed to operate the same. However checking of skills by BHEL does not absolves contractor of his responsibilities for proper and safe handling of equipment. Consistent good performance of operators and regular performance evaluation of operators shall be ensured by the contractor.

37.7 The day to day and routine maintenance of BHEL's T&Ps should be carried out by contractor as per manufacturer's / BHEL's maintenance schedule at his cost. These shall be maintained in good working condition during the entire period of use. T&Ps in defective / damaged condition shall be rectified promptly to the full satisfaction of BHEL Engineer. Contractor shall maintain records for maintenance of major T&Ps, which shall be made available for Inspection whenever required. In case of any lapses on the part of the contractor BHEL at its own discretion get the servicing / repair of equipment done at the risk and cost of the contractor with BHEL overheads.

37.8 While the charges of service Engineers as assessed and arranged by BHEL for the mandatory servicing will be borne by BHEL, the contractor would provide all type of assistance at their cost.

37.9 The contractor shall arrange at his cost all spares needed for upkeep of all T&Ps other than cranes Spares needed for upkeep of BHEL's T&Ps shall be supplied by BHEL. Repair of self, dynamo, battery and electric wiring of BHEL's T&P's shall be the responsibility of the contractor. 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 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.

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

37.11 The area and infrastructure development of area to be carried out by the BHEL / 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.

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

37.13 The contractor shall furnish regular utilisation report of the BHEL's T&Ps as per requirement of BHEL.

37.14 Any loss / damage to any part of BHEL T&Ps 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.

37.15 It shall be responsibility of the contractor to take delivery of T&Ps and IMTEs from stores or place of use by other contractor at project site, transport the same to site and return the same to BHEL / its Customer's store/ place as intimated by BHEL Engineer in project site in good working conditions after use.

37.16 Replacement cost including BHEL's overhead in respect of irreparable / completely damaged / non return of T&Ps shall be recovered from the contractor's running bills.

37.17 The contractor shall return BHEL's / its Customer's T&Ps and IMTEs issued to him in good working condition as and when desired by BHEL. If return of T&P and IMTE is delayed by contractor, hire charges as applicable shall be levied by BHEL from time, it was requisitioned till the time of actual return. Hire charges shall also be charged on the T&Ps and IMTEs returned in damaged / unserviced condition to BHEL/ its customer till its satisfactory repair. T&Ps and IMTEs returned in damaged / unserviced condition shall be got repaired by BHEL at its own discretion and entire cost of repair with BHEL overheads shall be recovered from the contractor.

37.18 Contractor shall ensure deployment of serviced and healthy T&Ps including cranes, lifting tackles, wire ropes, Manila ropes, winches and slings etc. History card and maintenance records for major T&Ps will be maintained by the contractor and will be made available to BHEL Engineer for inspection as and when required. Identification for such T&Ps will be done as per BHEL Engineer's advice.

37.19 Contractor shall ensure deployment of reliable and calibrated IMTEs (Inspection measuring and Test equipment). The IMTEs shall have test/ calibration certificates from authorised/ Govt. approved / accredited agencies traceable to National / International standards. Each IMTE shall have a label indicating calibration status i.e. date of calibration, calibration agency and due date for calibration. A list of such instruments deployed by contractor at site with its calibration status is to be submitted to BHEL Engineer for control.

37.20 Re-testing / re-calibration shall also be arranged at regular intervals during the period of use as advised by BHEL Engineer with in the contract price. The contractor will also have alternate arrangements for such IMTE so that work does not suffer when the particular instrument is sent for calibration. Also if any IMTEs not found fit for use, BHEL shall have the right to stop the use of such item and instruct the contractor to deploy proper item and recall i.e. repeat the readings taken by that instrument, failing which BHEL may deploy IMTEs and retake the readings at contractor's cost.

37.21 BHEL shall have lien on all T&PS, IMTEs & other equipment of the Contractor brought to the Site for the purpose of erection, testing and commissioning. BHEL shall continue to hold the lien on all such items throughout the period of Contract. No material brought to the Site shall be removed from the site by the Contractor and / or his Sub-contractors without the prior written approval of the Engineer.

37.22 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.

38.0 SUPERVISORY STAFF AND WORKMEN

38.1 The contractor shall deploy all the skilled / certified workmen like Mill Wright fitters, welders, gas cutters, crane operators, drivers, riggers, sarangs, masons, carpenters, electricians, instrument technicians etc., in addition to other skilled, semi-skilled and unskilled workmen required for all the works of unloading, handling, storage and transportation from site storage to erection site, erection, testing and commissioning as contemplated under these specification. Only fully trained and competent men with previous experience on the job shall be employed. They shall hold valid certificates wherever necessary. BHEL reserves the right to decide on the suitability of the workers

and other personnel who will be deployed by the contractor. BHEL reserves the right to ask for removal of any employee workman of the contractor at any time, if they find him unsuitable for any reason and the contractor shall remove him immediately without discussions on the reasons.

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

38.3 The 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.

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

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

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

38.9 The month wise manpower deployment plan to be submitted as per format (at Annexure-C to General Conditions of Contract) is only to assess the capability as well as understanding of the contractor to execute the work. It shall be the contractor's responsibility to deploy the required 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. Separate certified persons shall be identified at site for quality control and safety by the contractor.

39.0 MATERIAL HANDLING AND STORAGE

39.1 All the equipment/ material furnished under this contract shall be received from the project stores, sheds / storage yards & transported to pre assembly area / erection site & stored in the storage spaces in a manner so that they are easily retrievable till the contractor erects them.

39.2 The contractor shall take delivery of components / equipment from storage area after getting the approval of BHEL Engineer on standard indent forms. It shall be contractor's responsibility to assist BHEL in identifying materials well in time for erection, taking delivery of the same, following the procedure indicated by BHEL, and transport the material safely to pre-assembly yard /erection site in time, according to programme. While drawing/ lifting material from BHEL / customer stores, contractor shall ensure that the balance / other materials are stacked back immediately at no extra cost to BHEL. Some of the consignment may have to be unloaded in the assembly area and at or near erection site directly from truck / trailer, the procedure for handling this material too will be same as for the material received in stores and as advised by BHEL Engineer.

39.3 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.

39.4 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.

39.5 Contractor shall ensure that while lifting slings shall be put over the points indicated on the equipment or as indicated in the manufacturer's drawings. Slings/ shackles of proper size shall be used for all lifting and rigging purposes. All care shall be taken to safe guard the equipment against any damage. In no case piping should be dragged. In case of any damage due to mishandling, the cost shall be recovered from the contractor.

39.6 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 at no extra cost to BHEL

39.7 Contractor shall be responsible for examining all the plant material issued to him and notify the Engineer immediately of any damage, shortage, discrepancy etc. before they are moved out of the stores/ storage area. The contractor shall be solely responsible for any shortages or damages in transit, handling, storage and erection of the equipment once received by him. As the erection work will be spread in different areas / locations of the

project, contractor has to arrange sufficient no. of watch / ward personal to avoid any pilferage of material. 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.

39.8 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.

39.9 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.

39.10 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.

39.11 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

39.12 The contractor shall ensure that all surplus / damaged / scrap / unused material, packing wood / containers/ special transporting frames etc. are returned to BHEL / Customer at a place in project area identified by the Engineer. The contractor for all such items received and returned to BHEL/ Customer will maintain an account. Contractor will stack the daily removed packing material at one place and shift the same weekly or at such frequency to it's final location (including weighing of the same within the Refinery area if required), as decided by BHEL Engineer / customer.

39.13 The contractor shall return all surplus materials with proper identification tags to BHEL / BHEL's client stores as per advise of BHEL Engineer.

40.0 PRESERVATION OF COMPONENTS

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

a) Items stored outdoors shall be stored in such a way that item is at least six inches (6") above the ground

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

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

d) 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 (Primer), 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 A separate gang of minimum two persons with all the necessary paints (Primer) / preservatives, scaffoldings and other arrangements shall be provided by the contractor within the finally accepted rate.

40.4 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.

40.5 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

41.1 All the Fixtures including omega lugs etc., scaffolding materials, concrete block supports, steel structures required for temporary supporting, preassembly, installation, welding, lifting and handling or checking etc during pre-assembly and erection shall be arranged by contractor at his cost.

41.2 It shall be contractor's responsibility to check the various equipment foundations for correctness with respect to level, orientation, dimensions etc. and ascertained dimensions shall be measured and submitted to BHEL for approval before erection.

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

41.4 HRSG supporting structure includes ACC sheets, monitor-roofs of drum & burner operating level including drains to canal. Contractor has to install these roofs as per drawings. The cement required for jointing of the ACC materials will be issued by BHEL free of cost.

41.5 It shall be the responsibility of the contractor to provide prefabricated ladders **including materials at his cost** on columns for initial work till such time stairways are completed. No temporary welding on any structural member is permitted except under special circumstances with the approval of BHEL.

41.6 No members of the 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.

41.7 The contractor is strictly prohibited in using the HRSG / BOILER components like angles, channels, hand rails etc. for any temporary supporting or scaffolding works. In case of such misuse a sum as determined by BHEL Engineer will be recovered from contractor's bills.

41.8 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/ pipes within finally accepted rates.

41.9 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 within finally accepted rates.

41.10 Adjustments like removal of ovalities in pipes and opening or closing the fabricated bends of piping to suit the layout shall be considered part of the work and the contractor is required to carryout such work within the finally accepted price / rates as per instructions of BHEL, which shall include specified heat treatment & NDT procedures etc.

41.11 Certain adjustment in length may be necessary while erecting pipelines / ducts/ casings/ claddings etc. and the contractor should remove the extra lengths / add extra lengths to suit the final layout after preparing edges afresh by adopting specified welding/NDT/ heat treatment procedures, at no extra cost. 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.

41.12 The contractor shall completely erect & test all the integral piping systems, covered in the specification including sampling lines upto & including sample coolers, hangers & supports, valves & accessories in accordance with the drawings furnished. This includes all necessary bolting, welding, preheating, stress relieving, testing, cleaning & painting. System shall be demonstrated in condition to operate continuously in a manner acceptable to the Engineer. Welding shall be used throughout for joining pipes except where flanged, screwed or other type joints are specified or shown on the drawings. All piping shall be erected true to lines & elevation as indicated in the drawings. All vents and drains for piping equipment covered in the scope whether shown in the drawings or not, shall be terminated at suitable sump-pit (unless otherwise directed) as directed by the engineer. The contractor shall assist BHEL in preparation of as built piping drawings.

41.13 Steel for suspensions for piping, ducting etc will be supplied in running lengths. These are to be cut to suitable sizes and adjusted as per requirement.

41.14 Pipes sent in running lengths 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 up to 80 mm NB will have to be fabricated and tested at site within the finally accepted rates.

41.15 Economiser / super heater coils/ Reheater coils, burner panels & valves may have to be hydraulically tested individually, if required, before erection as instructed by BHEL engineer within finally accepted rates.

41.16 Fittings and welding of necessary instrumentation tapping points, thermocouples pads, valves, root valves, condensing vessels, flow nozzles orifice plate and control valves etc. will also be the responsibility of the contractor and will be done as per the instructions

of BHEL Engineer within finally accepted rates. The erection, welding / NDT of all the above items will be contractor's responsibility even if the:

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

(ii) Items are supplied by any agency other than BHEL.

41.17 a) All the valves including motorised 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 / jointing of extension spindle for valves to suit the site conditions and operational facility shall be part of erection work within the finally accepted rates.

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

c) The contractor shall dismantle the valves & actuator for overhauling, servicing & lubrication wherever required as advised by the Engineer. The contractor shall also lap or grind valve seats for ensuring the satisfactory performance of valves at no extra cost. All parts such as gaskets, gland packing which form the permanent part of equipment shall be supplied by BHEL free of cost.

41.18 No temporary supports should be welded on the pressure parts or piping. Welding of temporary supports / cleats etc., on main HRSG / BOILER columns should be avoided. Incase of absolute necessity prior approval from BHEL Engineer will be obtained by contractor.

41.19 All hangers, supports and anchors shall be installed as per drawing to obtain safe and reliable and complete pipe installation as per instructions of Engineer. Any additional support as called for by Engineer shall have to be fabricated and erected by the contractor. The raw materials required for fabricating such supports shall be supplied by BHEL free of cost and contractor shall be eligible for payment of such additional supports as per applicable item of rate schedule.

41.20 The contractor shall ensure that all supporting elements, anchors & restraint have been installed and adjusted in accordance with the drawings / sketches & other written instructions of the Engineer. The contractor shall inspect the hangers associated with the piping systems as follows:

- After hydraulic test, with the piping in the cold position, with all travel stops removed, with the pipe completely insulated and complete in all respect ready for start up.
- Piping in the hot position with the unit operating at the maximum load.
- Piping in the cold position during the first complete shut down.

41.21 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 arrestors / lockers etc., have to be carried out as and when required.

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

41.23 All attachments welding including those for insulation works coming on pressure parts / non-pressure parts which the contractor has erected shall have to be done by the contractor within finally accepted rates only.

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

41.25 Layout of small bore piping in HRSG / BOILER and fuel 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 pipe lines even after completion of erection or from aesthetic point of view. Contractor at no extra cost to BHEL should carry this out. Bends up to 80 mm NB will have to be fabricated and tested at site within the finally accepted rates**.** As built drawings shall also be made by the contractor and submitted to BHEL after final execution of respective small bore piping work with in the final accepted tonnage rate.

41.26 Additional platforms and ladders of permanent nature for approaching different equipment, as per site requirement which may not be indicated in drawings shall be fabricated and installed by the contractor. However, the contractor will be paid for this work on accepted tonnage rate for erection irrespective of number of platforms. The materials required for platforms excluding consumables and T&P will be provided by BHEL, some materials for such work may have to be taken from packing materials, the contractor will be required to retrieve the same from packing materials by using gas cutting etc. at no additional cost to BHEL.

41.27 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 for pneumatic valves & power cylinders shall be arranged by BHEL through C&I agency at no cost to the contractor for this package. 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 valves & electrical operated actuators covered under this package shall be erected, tested & commissioned by the vendor for this package.

41.28 Hanger rods are shown in the pressure parts arrangement drawings for HRSG / BOILER. Any cutting / welding of these hanger rods will be done by the contractor. The hangers for pressure parts will be tested for even distribution of load with the help of torque wrench, which is to be arranged by the contractor.

41.29 All rotating machines and equipment shall be cleaned, lubricated, checked for their smooth rotation, if necessary, by dismantling and re-fitting before erection. If, in the opinion of the BHEL engineer, the equipment is to be checked for clearances, tolerances at any stage of the work or during commissioning period, the contractor at his cost shall carry the dismantling, cleaning, lubricating and re-fitting. All rotating machines shall be rotated periodically during storage, erection and log maintained to avoid bowing of shafts.

41.30 All the shafts of rotating equipment should be properly aligned to those of the matching equipment to as perfect and as accurately as practicable. The equipment shall be free from excessive vibrations so as to avoid over heating of bearings or the conditions which may tend to shorten the life of equipment. All bearings, shafts and other rotating parts shall be thoroughly cleaned and suitably lubricated before starting.

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

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

41.33 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.

41.34 The contractor, at no extra cost to BHEL, shall carry out servicing and realignment of skid mounted equipment, if required by BHEL.

41.35 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.

41.36 Contractor shall carry out kerosene testing of all bearing housing 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 other equipment as per BHEL engineer's instructions is included in the scope of work.

41.37 Certain rotating machinery after, initial runs and commissioning of the equipment, have to be hot aligned as per the instructions of BHEL engineer. Cleaning fans, 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.

41.38 All the bearings, gear boxes, shaft and other rotating parts etc. of the equipment and electrical motors to be erected are provided with protective greases only. Contractor shall arrange as and when required by the engineer, for cleaning the bearing, gears etc. with kerosene or some other reagent, if necessary, by dismantling some of the parts of the equipment during erection and shall arrange for re-greasing / lubricating them with recommended lubricants and for assembling back the dismantled parts, within the finally accepted rates. Lubricants will, however, be supplied free of cost by BHEL.

41.39 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.

41.40 Packer plates should not only be blue matched with the foundations but also interpacker contact surfaces, contact surfaces between packer and equipment , contact surfaces between packer and foundation frame etc. shall also be blue matched by Prussian blue match checks and percentage contact shall be achieved by chipping, machining, scrapping as per BHEL engineer's instructions.

41.41 Contractor shall arrange changing of preservative oil in the gear boxes, 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 lub oil might have been made under regular despatchable unit no. against product group main assembly (PGMA) and appearing in the shipping list. Prior to the commissioning of the equipment, oil to be drained and collected in drums provided by BHEL and returned to BHEL /customer's stores.

41.42 The HT motor bearings shall be blue matched at site and checked for bearing clearances. The contractor shall carry out scraping of bearing housing if required. Check for air gap and adjustment of stator/ rotor for magnetic center of HT motor shall be carried out as part of erection.

41.43 The contractor shall be responsible for obtaining necessary approval and making whatever additions / modifications considered necessary by the Electrical Inspector, Boiler inspector or other authorities to bring the installation in conformity with the applicable rules and regulations. The liaison with the inspectors, arrangement for inspection / inspector's visit, preparation of documents, furnishing clarifications, information etc. as and when required will have to be done by the contractor with in the final agreed price.

41.44 Contractor shall take all safety measures and ensure that adequate precautions are enforced for area safety and good house keeping is maintained in their work area in line with BHEL and it's client's safety policy. All packing material and scrap steel etc. shall be cleared from work site both inside 'plant courtyard' and area so allotted for site fabrication, on regular basis and transported to identified disposal yard as allocated by BHEL / it's client.

41.45 The temporary wiring used for construction power supply in fabrication area shall be taken through PVC pipes / conduit or overhead on temporary poles.

41.46 The entire work is being executed as per the specifications, drawing and documents furnished by BHEL manufacturing units and as directed by BHEL Engineers at site to the entire satisfaction of BHEL' client. BHEL's client / client's consultant has full authority to check / recheck / inspect any work, T&P, procedure, process etc. at any point of time jointly with BHEL or independently. It shall be responsibility of the contractor to cooperate in every respect and provide the necessary assistance with in the final accepted rates.

41.47 The fans and other rotating machines shall be checked for clearances & 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. .

42.0 DRUM LIFTING & PRESSURE PARTS MODULE ASSEMBLIES ERECTION.

42.1 Boiler drum shall be unloaded either in storage area or near the erection site / boiler / HRSG depending upon site conditions, by another agency. Shifting / dragging of the same to erection site for erection shall be within the scope of this contract and will be erected as per site conditions and instructions of BHEL Engineer.

42.2 The boiler drum of HRSG has to be lifted with 75 / 100 / 200 MT crane after the pressure part modules are positioned & secured. Being self-supporting the drum will not have any suspension arrangement. Fabrication & installation of the temporary structure for supporting & final alignment is in the scope of contractor. The structural material will be supplied by BHEL free of cost. This temporary structure is to be removed after the completion of welding of connecting piping.

42.3 The pressure part (modules) are received at site with temporary transportation arrangement. The contractor has to remove these structure at defined stages of material handling / erection at no extra cost to BHEL. The temporary structures has to be accounted / returned to BHEL stores within the quoted rates.

42.4 Structural steel will be provided for handling of single module of HRSG and for up- righting them. Fabrication of this structure will be in the scope of the contractor. After erection of the modules this structure has to be accounted for / returned to BHEL stores. The contractor will be paid as per the quoted tonnage rate.

43.0 WELDING, HEAT TREATMENT, RADIOGRAPHY and NDT:

43.1 The pressure parts & IBR pipe lines shall be erected in conformity with the provision of Indian Boiler Regulations and as may be directed as per any other standards/ 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.**

43.2 Welding of pressure parts / equipment / piping / high tensile structural steel shall be done by certified high pressure welders who possesses valid certificate of CIB of the state in which the equipment is erected as per provision of IBR. The HP. welder who possesses necessary certificate shall appear well in advance before the expiry of the validity of his certificate for re-qualification test as per relevant provision 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 have to be terminated forthwith.

43.3 All welders including tack welder , structural and high pressure welder shall be tested as per ASME section IX and approved by BHEL Engineer before they are actually engaged on work though they may possess the IBR certificate. BHEL reserves the right to reject any welder if the welder's performance is not found to be satisfactory. The records of qualification and performance of each HP welder shall be maintained by the contractor in Performa given by BHEL Engineer. All the welders qualified for the work will be issued an

identity card by the contractor with the approval of BHEL Engineer and welder will keep the same with him at work place. The record of joints, consumables & equipments along with welders identity shall be maintained by the vendor as per BHEL Engineer's instructions.

43.4 The root run welding of all butt welds of tubes/ pipes (HP or LP), instrumentation tapping points etc. will be done by TIG welding process only. Subsequent welding will be done as per welding schedule / Instructions of the engineer including full TIG welding of butt weld joints of tubes / pipes of lesser thickness if required. The contractor within the finally accepted rates shall arrange purging with inert gas in case of stainless steel joints as per requirement.

43.5 Complete penetration of welding shall be achieved and all welded joints shall be subject to acceptance by the Engineer.

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

43.7 Faulty welds caused by the poor workmanship or lack of supervision of lack of supervision on the part of the contractor shall be cut and re-welded at the contractors expenses. The procedure for the repair of defective welds shall be approved by the Engineer prior to any repair being made. For each batch of approved brassed certified showing compliance with the specification shall be secured and shall be submitted to the BHEL Engineer.

43.8 All charges for testing of contractor's welders including destructive and non destructive tests conducted by BHEL at site or at any laboratory shall have to be borne by the contractor only. The materials for plate test pieces and for pipe and tube will be given by BHEL.

43.9 All welds shall be painted with anticorrosive paint, once Radiography and stress relieving works are over. Necessary consumables and scaffolding etc. including paints shall be provided by contractor at his own cost. Daily welding reports in the proforma suggested by BHEL should be submitted without fail.

43.10 **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 will have co-relation with the lot No. / batch No given on electrode packets. No electrodes will be allowed to be used in the absence of above requirement. The thermostat and thermometer of electrode drying oven should also be calibrated and test certificate from Govt. approved / accredited test house traceable to National / International standards shall be submitted to BHEL before putting the oven in use. Periodical calibration for the same shall also be arranged by the contractor within the finally accepted rates.

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

cost and records shall be maintained. The regulators used with the gas cylinders should be of repute make and preferably ISI marked.

43.12 Preheating, radiography and other ND 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. All equipment's and consumables essential for carrying out the above process have to be arranged by the contractor at his cost.

43.13 Contractor shall arrange all necessary heating equipment with automatic recording devices. Also the contractor shall have to arrange for labour, heating elements, thermocouples, etc. insulating materials like asbestos cloth, ceramic beads, asbestos ropes etc. required for heat treatment/ stress relieve operations. Temperature shall be measured at least at two different points for pipes above 200 mm dia. by thermocouple, and recorded on a continuous printing type recorder. All the recorded graphs for heat treatment works shall be the property of BHEL. The contractor has to provide thermo-chalks, temperature recorders, thermocouple attachment units, graphs, sheets, etc. for checking within the finally accepted rates. 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 after setting up the weld joints for heat treatment operation prior to the starting.

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

43.15 Iridium-192 shall be used by contractor for radiography work. The geometric unsharpness shall not exceed 1.5 mm. Taking adequate safety precautions shall be the responsibility of the contractor while carrying out radiography. Necessary safe guards required for radiography (including personnel from BARC) shall be arranged by contractor at his cost. All related documents issued by BARC shall be submitted by the contractor to BHEL.

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

43.17 All radiographs shall be free from mechanical, chemical or process marks, to the extent they should not confuse the radiographic image and defect finding. Penetra meter as per ASME, DIN, and ISO and as specified by BHEL must be used for each exposure.

43.18 Lead numbers and letters are to be used (generally 6 mm size) for identification of radiographs. Contract no., joint identification, source used, welder's identification and SFD are to be noted down on paper cover of radiograph.

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

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

43.21 For multiple exposure on pipes, an overlap of about 25 mm of film should be provided.

43.22 The contractor shall have a dark room fully equipped with radiography equipment, film (un-exposed), chemicals and any other dark room accessories ie all the facilities including airconditioners for storing and processing radiography films. There should be adequate number of radiography personnel with sufficient experience and certified by M/s BARC as Radiographer for conducting radiography test in accordance with safety rules laid down by Division of Radiological protection. These personnel should also be registered with DRP / BARC for film badge service. The proof of having sufficient film / chemicals to complete the entire work should be shown to BHEL.

43.23 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.

43.24 Contractor shall note that 100% radiography will be done at the initial stages on all the HP 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 IBR or as specified by BHEL. The percentage may be increased depending upon the quality of joints and at the discretion of BHEL. Every rejection shall be penalised with further two no of additional weld joints to be radiographed in case of percentage radiography.

43.25 If the contractor does not carryout 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.

43.26 All the radiographs shall be properly preserved and shall become the property of BHEL.

43.27 Since radio-isotopes are being used, all precautions and safety rules as prescribed by BHEL/BARC/Customer shall be strictly followed. BARC/ DRP Certificates to be provided before taking up the work.

43.28 The defects as pointed out by the engineer shall be rectified and re-radiographed immediately to the satisfaction of BHEL Engineer. The decision of the engineer regarding acceptance or otherwise of the joint will be final and binding on the contractor.

43.29 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 shall be replaced immediately.

43.30 Wherever radiographs are not accepted, on account of bad shot, joints shall be re-radiographed and re-shots submitted for evaluation. Radiographs shall be taken on joints after carrying out repairs. However, if the defect persists after first repair, as per radiograph, carrying out radiography shall be repeated till the joints is made acceptable. In case the joint is not repairable, the same shall be cut, re-welded and re-radiographed at contractor's cost.

43.31 The contractor shall also be equipped for carrying out other NDT like LPI / MPI/ UT etc. as required as per welding schedule/ drawings within the finally accepted rates/ prices.

43.32 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, supervisor/ Engineer required for the work as per directions of BHEL.

43.33 The contractor shall maintain a record in the form as prescribed by BHEL of all operations carried out on each weld and 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, heat treatment (if any) 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. All site welding joints shall be subject to acceptance by BHEL Engineer.

43.34 All butt / fillet welds shall be subject to dye penetration test as per the instructions of the Engineer at no additional cost.

43.35 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 will be allowed only wherever edge preparation otherwise is impractical. All slags / burrs shall be removed from cuts and all the hand cuts shall be ground smooth to the satisfaction of engineer.

43.36 The contractor's Engineer shall prepare as per direction of BHEL Engineer the 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 and submit the same to BHEL Engineer for approval. Such schedules shall be strictly adhered to by the contractor after approval.

44.0 APPLICATION OF INSULATION

The application of insulation materials & sheet casing work include but not limited to the following.

44.1 All attachment welding including welding of hooks / supports as per pitch both on equipment & piping shall have to be done by the contractor as per drawings or as directed by Engineer. Attachment welding shall have to be done by certified welders. If necessary contractor may have to cut the hooks without any extra cost. The HRSG / BOILER ducting / casings shall be internally insulated with ceramic wool and cladded with stainless steel sheet on stainless steel hooks & retainers. Plasma cutting machine required is to be arranged by the contractor.

44.2 Applying of red oxide paint including supply of paint on welded portions as directed by Engineer.

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

44.4 The no. of layers / thickness of mineral / ceramic wool shall be as per various drawing / insulation schedule and as directed by Engineer. After applying the mineral / ceramic wool mattress, the required holding materials if necessary (by fabrication of rings/ hooks at no extra cost) shall be fixed as directed and as per drawings and specifications. Required material for fabrication of rings / hooks shall be supplied by BHEL free of cost.

44.5 Application of two coats of anti-corrosive black bituminous paint (corresponding to relevant IS code) on inner surfaces of sheet cladding and bitumen sealing compound on cladding joints, if necessary, is included in the scope of this work and will be carried out within the finally accepted rates. The sealing compound and the anti-corrosive black bituminous paint required for this work is to be arranged by the contractor at his cost

44.6 To ensure that the finished surface of the insulation conform to the dimensions and tolerances given in the drawing. Aesthetic finish and accuracy of work are most important.

44.7 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 tending to affect its quality by the provision of closed / semi closed sheds 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 breakages or damages allowed in such cases, the cost of such damaged material shall be to the account of the contractor.

44.8 Contractor is liable for the accounting of the material issued to him and any unaccountable losses shall be made good by him.

44.9 All the 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.

44.10 Contractor shall mix & 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.

44.11 Application of Castable refractory between tubes, around burners, on ceiling is to be done as directed by Engineer and as per detailed drawings & specifications.

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

44.13 Contractor shall observe all precautions for laying / curing of Castable refractory. Any defective works found shall be rectified by contractor at his own cost including materials.

44.14 Making structural supporting work for pour able insulation, laying pour able insulation, adhering to all specifications and instructions during application form part of this work.

44.15 The contractor shall provide the required quantity of wire, nails, planks for formwork and other material for centering and grouting works.

44.16 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.

44.17 Plates, bars and rods and other materials shall be cut and rewelded from the fabricated pieces to suit erection requirements for which no extra payment shall be made to the contractor.

44.18 Aluminum / stainless steel sheet metal cladding over insulation will consists of plain / ribbed / corrugated sheets. The sheets will be supplied in standard sizes. Their application shall be carried out by fabrication to the sizes and shapes specified in drawings,beading, swaging, bewelling of sheets, crowning the sheets if necessary, application of two coats of anti-corrosive black bituminous paint on inner surfaces, fixing the same to supports over wool insulation with screws as specified in BHEL drawings or as instructed by BHEL Engineer.

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

44.20 Wastage allowance for insulation materials issued are as follows:

a) Wool / LBM mattresses and cladding sheets : 2%
b) Castable refractory : 2%
c) Insulation bricks & mortar : 2%

44.21 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 reapplication of insulation and sheet metal cladding, which shall be done by the contractor at no extra cost and the erection rate quoted shall be inclusive of such contingencies.

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

44.23 Removable type of insulations to be provided for valves, fittings, expansion joints etc. as per the drawings or as directed by BHEL Engineer.

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

45.1 The contractor shall carry out the required test on the HRSG / BOILER, ducts and pipelines such as gas / air leak test, hydraulic test etc. as instructed by BHEL using contractors own consumables, labour and scaffoldings. 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 / defects etc.

45.2 The contractor shall carry out all the tests 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.

45.3 All the above tests should be repeated till all the equipment satisfy the requirement / obligation of BHEL and BOILER Inspectorate, if required at various stages. The contractor shall do the entire repair for site-welded joints arising out of the failures during testing as part of work within finally accepted rates.

45.4 Contractor shall lay out all necessary temporary piping, install the pumps, blowers, tanks etc., with access platforms, valves, pressure gauges, electric cables, switches, cutting of

some of existing valve, placing of rubber wedges in the valves etc., required for hydro test, air /gas leak tests, alkali boil out, chemical cleaning and steam blow off or for any other tests as the case may be and will carry out above activities under this scope of work as per instructions of BHEL. The scope also covers the off site disposal of effluents, site clean up and removal of temporary piping, pumps etc. and returning same to stores. The contractor will be paid for piping, valves & fittings only so erected as per applicable tonnage rate. However charges for dismantling of temporary lines etc., and returning of same to BHEL stores shall not be paid separately and should be included in the finally accepted rates.

45.5 All items required for conducting hydraulic test, air/gas leak test, alkali boil out, chemical cleaning of pipe lines, steam blowing etc., will be supplied by BHEL/ its Customer. However, servicing, erection and dismantling and returning of the same to Stores is the responsibility of the contractor. The unit tonnage rate will cover all above activities.

45.6 It shall be the responsibility of the contractor to preserve the HRSG / BOILER as per BHEL's requirement.

45.7 Drum may be dispatched without fixing internals and internals may be sent separately in loose. The internals have to be fixed as and when required. Dismantling and re-assembly to be done to suit various commissioning requirements at no extra cost to BHEL

45.8 Commissioning of the HRSG / BOILER will involve trial run of all the equipment erected, alkali flushing, alkali boil out, acid cleaning, passivation, preservation, steam blowing, floating of safety valves, flushing of all the lines by air, oil or steam as the case may be, trial run of the HRSG / BOILER, servicing of valves and any other works incidental to commissioning. Contractor shall provide various category of manpower in sufficient numbers along with supervisors / engineers including necessary consumables, IMTEs, T&P etc and any other assistance required during pre-commissioning, commissioning & post commissioning of equipment & attending any problem in the equipment erected by the contractor till handing over. Association of BHEL's / Client's staff during above period will not absolve contractor from above responsibilities.

45.9 The valves will have to be checked, cleaned or overhauled in full or in part before erection, after alkali boil out, steam blowing and during commissioning as may be necessary and is the part of erection & commissioning.

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

45.11 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.

45.12 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 contractor's finally accepted rates/ price shall be inclusive of all these factors also.

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

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

45.15 All temporary supports shall be removed in such a way that pipe supports are not subjected to any sudden load. During hydro static 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.

45.16 The contractor shall carry out cleaning and servicing of valves and valve actuators prior to pre-commissioning tests and / or trial operations of the plant. System for recording of such servicing operations shall be developed and maintained in a manner acceptable to BHEL Engineer and 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 at no extra cost.

45.17 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.

46.0 PROGRESS REPORTING

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

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

46.3 The contractor shall submit daily, weekly and monthly progress reports, HP joints welding and radiography reports, manpower reports, materials reports, consumables report and other reports as per proforma considered necessary by the Engineer.

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

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 DRAWING 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 / documents 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 drawing/ data/ documents and removal of obsolete ones from work place and returning to BHEL.

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

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.

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

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

48.0 EXTRA WORK:

48.1 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 repair on the BHEL / CUSTOMER supplied material and which are totally unusual to normal erection work.

b) Require rectification / modification for change or improvement in the design during erection or commissioning,

c) Requiring fresh fabrication of components in place of rejected /replaced components. Where rejection is not due to contractor's workman-ship.

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

48.3 The extra works, if any, shall be carried out by a separate gang, which can be identified for certification of man-hours. Logbook should be maintained and should be signed jointly by the contractor's representative and the BHEL Engineer on day-to-day basis. However, signing of the 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, which are certified by the BHEL Engineer-in-charge, will be considered for payment. The decision of BHEL in this regard shall be final and binding on the contractor.

49.0 INCOME TAX AND SALES TAX

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

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

With introduction of Cenvat credit rules 2004 which came into force w.e.f. 10.09.2004, excise duty paid on input goods including capital goods used for providing the output service and service tax paid on input service can be taken credit of against the service tax payable on output service. **As such, while offering the rates, the contractors may take into account the benefit of above provisions as the cost of input to contractors will be the cost net of excise duty and service tax and adjust their offer price accordingly to make it more competitive.**

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

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

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

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. The required documents shall be submitted by contractor.

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

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

P0 = Grossed 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 1982 =100) applicable for the month under consideration i.e. for which bill has been raised.

F0 = All India CPI published by Labour bureau, Simla, Govt. of India, for Industrial workers (Base 1982 =100 applicable for the month of 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 5% 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 escalation provisions in full towards minimum wages, consumables, electrodes, gases or any other item / reason) will be payable during the entire period of execution including extended period, if any.

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). Conditional price bids or price bids with any deviation / clarification etc. are liable to be rejected. No cutting / erasing / over writing shall be done.

52.0 INSTRUCTIONS TO TENDERER

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

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

52.3 The tenderer are advised to physically visit the site and fully acquaint themselves with site conditions, **safety norms being followed / to be followed during working,** transportation routes, various distances and the fact that other contractors would be working in this area their structures are to be protected. The material brought and stacked for construction should not make hindrance to other contractors. Necessary precaution and arrangements including sprinkling of water during work as acceptable to BHEL for safety & security for the above have to be made by the contractor. No claim whatsoever will be entertained by BHEL on any such account and the contractor's rates shall be deemed to have taken this into account.

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

SECTION - III B

SPECIAL CONDITIONS OF CONTRACT

Cl. No Description

SECTION - III B

SPECIAL CONDITIONS OF CONTRACT

53.0 SCOPE OF WORK

53.1 Scope of these specifications include but not limited to following:

(a) Taking delivery of material from project stores/ storage yards / storage place, shifting to erection site, their preservation, safe keeping, watch & ward, checking, dressing, chipping, and leveling of foundations, pre-assembly, erection, alignment, welding, radiography and other nondestructive testing wherever needed, heat treatment, finish painting including supply of paints etc., hydraulic testing, air leak test, chemical cleaning, alkali boil out, steam blowing and safety valve floating including erection & dismantling of all temporary piping, valves, pumps, tanks etc. required for above operations and other commissioning activities including post commissioning, Unit trial operation and handing over of 2 x 182 TPH HRSG (including 70 M high steel chimney) with related auxiliaries at Combined Cycle Power Plant of M/s Rajasthan Rajya Vidyut Utpadan Ltd (RRVUNL) at Dhoulpur Rajasthan.

(b) The details of major items (PG) to be erected are as per Annexure-1. Total tentative tonnage to be erected is 5507 MT including chimney & auxiliaries. But the contractor is required to erect actual tonnage (irrespective of any variation plus or minus) which may be necessary to commission above HRSG / Boilers and complete the work in all respects as detailed in tender specifications, for which payments shall be released on finally accepted tonnage rates.

The total weight of chimney and Weight of heaviest shell piece to be handled is indicated in Annexure I. Each shell has to be erected / welded at site after removing ovality. The chimney is to be insulated on outside with mineral wool & aluminum cladding upto full length. The scope of work also includes erection & commissioning of earthing, aviation & lightening arrestor of chimney as supplied by BHEL. No Claim will be entertained, in case the number of shell increases due to change in shall height.

53.2 The weights and other details indicated under various Annexures are tentative and may vary. The contract value will be worked out based on the rates quoted against each item of rate schedule and quantity indicated against those items. The quantities indicated against each item may vary to any extent and No compensation will be payable in variation of Individual quantity. **However in case of over all variation in Contract value (as indicted in LOI), beyond (minus) 30%, the contractor will be eligible for compensation as per the following provision:**

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

53.3 The contractor under this contract shall also provide free of cost services of skilled persons for a total period of **80 Man-months** exclusively for use by BHEL. This manpower will be required for following services

- Qualified persons experienced in computer working for maintaining store record and posting stock ledgers and secretarial work. (16 manmonths)
- Skilled workers for working in store, office and colony. (32 manmonths)
- Unskilled workers for working in store, office and colony. (32 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 categories given plus 10% will be made from the final bill of the contractor.

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

53.5 Bidder may note that as the place of work is inside the premises being manned by Customer's security agency, all necessary system related to entry of men, vehicle & material, safety & security systems, work permit system etc. as applicable will have to be followed by the contractor.

53.6 Customer's Civil contractor is carrying out barricading of entire working area. However localized barricading may be required to carry out works like welding, gas cutting, grinding etc. Localised barricading of construction area, using GI sheet, scaffolding etc. is to be arranged by the contractor for subject work at his cost. Contractor may have to take required work permit, as per existing refinery procedures for carrying out works which may produce sufficient heat to ignite flammable vapor.

54.0 FINISH PAINTING

54.1 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. Mostly the equipment / components installed are with one coat each of primer paint and synthetic enamel / heat resistant paint. However, due to storage and handling, the same may have got deteriorated or peeled off. 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.

These cleaned surfaces are to be touch up painted with suitable approved primer matching with shop paint approved final colour. Bare surfaces / unpainted surfaces shall be provided with two coats of suitable primer after cleaning as above.

54.2 After applying primer as above, all the structure, equipment / items and piping (covered under the scope of this contract) are to be finished painted with approved quality synthetic enamel paints (as specified by BHEL engineer) to achieve proper finish and film thickness as per drawings / specifications. The minimum thickness of painting as specified has to be checked by Alchometer (to be arranged by contractor) duly calibrated / suitable means as per advice of BHEL Engineer. Chimney is required to be painted out side in full length using heat resistant and acid resistant aluminum paint silencers and un-insulated steam lines have to be painted with Heat Resistant Aluminum paint

54.3 Certain equipment like control panels, valves etc. shall require spray painting. The contractor shall make arrangements of the required equipment for spray painting of such equipment at his own cost. Spray painting at the job site shall be permitted only at times and locations approved by the owner / Engineer.

54.4 **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. 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 the finally accepted rates. All paints should be stored in well-ventilated store. The painters and other personnel deployed should use proper protective equipment to avoid inhalation of fumes. No paint whose shelf life has expired should be used for painting. The contractor shall ensure availability of

- Ford Cup-4 to measure consistency of paint,
- Automatic magnetic gauge to measure the dry film thickness and
- SSPC Visual standards to assess degree of cleanliness of surfaces to be painted.

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

54.6 The painters have to under go test and only qualified painters will be allowed to work. The contractor shall make all arrangements including materials for testing of painters at his cost

55.0 FACILITIES TO BE PROVIDED BY BHEL / CONTRACTOR

55.1 BHEL shall provide free of charge limited open space, for office & storage shed, as and where made available by M/s RRVUNL. It is the responsibility of the contractor to construct sheds, provide all utilities and dismantle and clear the site after completion of work or as and when required, as a part of his scope of work.

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

55.3 The contractor shall submit to BHEL Engineer his electrical power requirements. Construction power, for construction purposes as well as office use will be provided ON FREE OF CHARGE BASIS at one point near erection site from supply point. 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. Required energy meter, duly calibrated, for measurement of power consumed has to be arranged / installed by Contractor at his cost.

55.4 The contractor should arrange at his cost for temporary lighting in & around his work area for execution of work. Adequate lighting facilities such as flood lights, hand lamps shall be arranged by the contractor at the site of construction, contractor's material storage area etc. within finally accepted rates.

55.5 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.

55.6 Provision of distribution lines of both electrical power and water from the supply 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/ Earthing, change over switches etc. at his own cost. If any failure is caused in supply of the power and water, it is the responsibility of the contractor to make alternate arrangements at his cost. The contractor shall adjust his working shifts / hours accordingly and deploy additional manpower if necessary so as to achieve the targets.

55.7 Following points should be strictly adhered to by the contractor while drawing construction power supply.

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

(b) All distribution Boards installed by the contractor should be constructed with fire proof materials viz steel frames, Bakelite sheets etc.

(c) Connection for single phase should be taken from phase and neutral. No where the connection should be taken with Earth as neutral.

(d) 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.

(e) Contractor have to make proper Earthing arrangement for their equipment / DB etc. The Earthing connections have to be done with proper size conductor and suitable lugs/clamps as per discussion with BHEL Engineer.

(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.

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

(j) ELCB will be tested biweekly by actually simulating the earth leakage for all installations and the same shall be recorded by BHEL Engineer in the log book to be maintained by the contractor.

55.9 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.

55.10 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 instruction of BHEL by the contractor at his cost. In the event of his failure to do so, same will be got done by the Engineer and expanses incurred shall be recovered from the contractor along with prevailing overhead. The decision of BHEL Engineer in this regard shall be final.

55.11 **Contractor shall ensure following:**

1. **Contractor has to maintain contact with local hospital having 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.**

   An ambulance is required to be arranged and maintained at site by the contractor for entire contract period for subject work. This emergency facility set up including ambulance, male nurse ets. Will be shared by BHEL and its other contractors working at same project at no cost to BHEL and its Sub contractors.

55.12 In order to meet the environmental concerns it is expected that the contractor shall **plant at least 200 trees and maintain the trees throughout the period of Contract** in the vicinity of the project as per advise of Engineers

56.0 TIME SCHEDULE

56.1 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. However, the actual date of start of work, for the purpose of establishing zero date of the contract, will be certified by BHEL Engineer after adequate mobilisation of manpower and T&P by the contractor for material handling work and site facilities.

56.2 Entire work as detailed in tender specification shall be completed within **15 months** from the Zero date of the contract as per the programs / milestones indicated by BHEL from time to time. Contractor has to mobilise adequate resources to meet BHEL commitments to customer as indicated from time to time.

56.3 The various tentative milestone dates to be achieved, for HRSGS the current status of contract are as below:

MILE STONES	**MONTH**
Start of HRSG 1	15 days from issue of LOI
Drum lifting	within 7 months
HRSG Hydro Test	within 9 months
Gas in & ABO completion	within 10 months
Steam Blowing completion, SVF and readiness for Trial operation	within 10 months
Module Trial Operation	within 15 months
Start of HRSG II	within 2 months of LOI
Drum lifting	within 9 months
HRSG Hydro Test	within 11 months
Gas in & ABO completion	within 12 months
Steam Blowing completion, SVF and Readiness for Trial operation	within 12months
Module Trial Operation	within 15 months

56.4 The work under the scope of this contract is deemed to be completed in all respects, only when all the works are carried out and the testing and trial runs including safety valve floating, and clearance from Statutory Authorities are completed. The decision of BHEL on completion date shall be final and binding on the contractor.

57.0 OVER RUN

57.1 In case due to reasons not attributable to the contractor, the work gets delayed and scheduled completion gets extended, the contractor shall not be entitled for any over run compensation for a period of first **2 (Two)** months after the contractual completion date. In case the scheduled completion time gets extended beyond **2 (Two)** months as stated above, the contractor shall be considered for payment of fixed over run charges @ **Rs 75,000/- PM (Rupees Seventy five thousand 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) The targets fixed during the over run period are achieved by contractor.

57.2 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.

57.3 The contractor shall maintain sufficient workforce and other resources required for completion of the job expeditiously / regular up keep, operation, maintenance , lubrication of erected equipment till the actual commissioning of the unit for the entire contractual period including total extended period.

57.4 For the purpose of ORC the actual date of start of erection as certified under clause 56.1 will be considered.

58.0 TERMS OF PAYMENT

58.1 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.

58.2 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.

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

I Progressive payment(85 % OF TONNAGE RATE) ON PRORATA BASIS AS FOLLOWS

a. **15%** of the Contract rate on pro-rata basis on completion of pre-assembly wherever applicable and **15%** of the contract rate on placement in position and rough alignment for the items where pre-assembly is involved.

OR

30% of the Contract rate on placement in position and rough alignment for the items where pre-assembly is not involved.

b. **55%** of the Contract rate on pro-rata basis on completion of final alignment / fastening / welding / grouting along with proper supports including radiography / NDT/ Stress relieving wherever involved.

NOTE: BHEL site in charge, at his discretion can split above payment.

II MILESTONE PAYMENTS, Total 8 % (4% for each HRSG)

- 1.0% of CV on completion of hydro test of the each HRSG
- 1.0% of CV on completion of ABO of the each HRSG.
- 1.0% of CV on completion of steam blowing and SV Floating of each HRSG.
- 1.0 % of CV on completion of trial operation of each HRSG.

Notes:

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

III FINAL PAINTING (2 %of CV)

2% of CV on successful completion of final finish painting including supply of paint (BHEL Site in charge at his discretion may split above and release payment on prorata basis for supply as well as for application of paints)

IV **2.5% of CV** shall be payable on completion of all pending work, rework wherever required, area cleaning, clearance of site and labour colony area in all respects and reconciliation of materials.

V The balance **2.5% of contract value** will be payable on handing over of the unit to BHEL's customer or 3 months after the contractor has discharged his responsibilities as stipulated in this contract whichever is earlier, if delay in handing over is not attributable to contractor.

NOTES: 1. Above payment against item No**. IV & V** shall be released after adjustment of the contract value based on actual work carried out against respective item of rate schedule.

2. The entire terms of payment indicated above is tentative. Further break up / re-distribution of terms of payment against any of the above TOP will be carried out at site to suit site requirement and entirely at the discretion of site in charge.

59.0 LIQUIDATED DAMAGES (LD)

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

60.0 SECURITY DEPOSIT

60.1 The contractor shall submit Security Deposit within 15 days from the date of issue of LOI as per clause no. 16.2 of the General Conditions of Contract (GCC). In case the contractor opts to furnish Bank Guarantee as a part of Security Deposit, the BG shall be issued as per the Performa enclosed as per Annexure-H of the GCC and also that the BG should be issued preferably through any of the Member Banks listed on Page No. 34(a) of the GCC;

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

61.0 OTHERS

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

61.2 The tenderer shall specifically confirm that he has inspected the site of work and acquired full knowledge and information about the site conditions, wage structure, Industrial climate, total work involved and will not raise claim of any nature due to lack of knowledge of site condition. He will also confirm that local taxation laws at the site have been clearly understood by him.

61.3 **The Price Bids of only those bidders will be opened who will be qualified for the subject job on the basis of pre-qualification evaluation / Techno-commercial bids and acceptance of customer. 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.**

62.0 INSURANCE

62.1 All equipment will be insured by M/s BHEL up to the time of completion of their erection, testing and commissioning within the comprehensive MCE policy. The MCE policy so taken shall have provisions for deductible franchise of 5% of the claim amount with following minimum values

1. HRSG & Auxilliaries- Minimum Rs 15000/- during normal period and Rs 40000/- during testing period

Subject to provisions of GCC clause No. 29.0 the deductible franchise shall be borne by contractor. The Contractor shall take an insurance policy for all the workmen employed by him against accidents and injuries as per the statutory requirements.

Annexure – 1

WEIGHT SCHEDULE

Approximate weights

HRSG I& II : 5080 MT
PIPING I & II : 335 MT
INSULATION ON PIPING : 60 MT
ALKALI FLUSHING & SB PPG AND INSULATION : 32 MT

Weight Schedule For HRSG

Sl. No.	DESCRIPTION	Wt in MT
1.	STRUCTURES	1044
2.	DRUMS	184
3.	MODULES-324 NOS	2308
4.	DRAINS & VENTS	376
5.	DUCTS	116
6.	CHIMNEY BASE+ 28 SHELLS	638
7.	TANKS AND FITTINGS	22
8.	INSULATION	310
9.	EECTRICAL AND C&I	20
10.	HANGERS & SUPPORTS	**70**
	TOTAL APPROX	**5080**

Weight Schedule For piping, hangers supports

S.NO.	DESCRITPION	WET. IN KG.
DHOLPUR PCP-1		
1	MS DUMP TOCONDENSER	9310.00
2	AUXSTEAM TO DEAERATING HEATER	8550.00
3	AUX STEAM TO GLAND SEALS SGSCOPE	617.50
4	STEAM FROM PROCESS BLR	58330.00
5	CONDENSER AIR EVACAUTION PIPING	1282.50
6	GSCOOLER LEAK OFF TO ATMOSPHERE	665.00
7	CONDENSTE SUCTION	5842.50
8	CD FROM PUMP TO LPH1/DC INLET TEE & RECIR	2280.00
9	CD FROM TG TP TO DEAERATING HEATER	32015.00
10	CONDENSATE FOR SEALING OF VACUUM	3040.00
11	CONDENSATE DUMP FROM HEADER	2517.50
12	BOILER FEED DISCHARGE PIPING	18810.00

13	BOILER FED PUMP SUCTION	5082.50
14	BOILER FEED PUMP RECIRCULATION	4797.50
15	BOILER FEED PUMP LEAK OFF & WARM-UP	190.00
16	UNLISTED SPRAY WATER-SG SCOPE	522.50
17	GLANDCOOLR DRAIN TO CONDENSER	285.00
18	DEAERATING HEATER OVER FLOW AND DRAIN	2232.50
19	HP PIPING DRAINS-SGSCOPE	9927.50
20	LPPIPING DRAINS SG SCOPE	10022.50
21	DRAINFROM UNLISTED EQPT/VESSEL-SG SCOPE	7600.00
22	DEMINERALISEDWATER SYSTEM	1852.50
23	SAMPLING PIPE	190.00
24	DRAIN FLASH TANK VENT TO COND.	1567.50
25	HIGHPRESSURE DOSINGPIPING	2375.00
26	LOW PRESSURE DOSINGPIPING	617.50
27	LUB OIL PIPING SYSTEM	4512.50
28	SUB DELVIERYVALVES FOR SYNCHRONISATION	142.50
29	H&S FOR LIGHT UP STEAM LINE	11827.50
30	H&S FOR LIGHT UP -NON STEAM LINES	33820.00
31	H&S FOR STEAM BLOWING	1330.
32	H&S FOR SYNCHRONISATION -STEAM LINES	522.50
33	H&S FOR SYNCHRONISATION -NON-STEAM LINES	1472.50
34	IMPORTED ELECTRODES	190.00
DHDHOLPUR PCP-2		
80305	MS DUMP TOCONDENSER	9452.50
80359	STEAM FROM PROCESS BLR	19665.00
80417	BOILER FEED DISCHARGE PIPING	3705.00
80921	H&S FOR LIGHT UP STEAM LINE	3847.50
80922	H&S FOR LIGHT UP-NON STEAM LINES	522.50
80923	H&S FOR STEAM BLOWING	1377.50
80992	IMPORTED ELECTRODES	19.00
DHOLPUR LP COMMON		
80463	TG AUX COOLING WATER	54150.00
80468	MAIN CIRCULATION WATER PIPING	39900.00
80477	SERVICE WATER PIPING	2565.00
80612	SERVICE AIR FOR INDIVIDUAL UNITS	4750.00
80616	INSTRUMENT AIR FOR INDIVIDUAL UNIT	3325.00
80901	SUB DELVIERY VALVES FORLIGHT UP	950.00
80933	H&S FOR LP PIPING	14250.00

Following are the major components to be handled at site.

1. HP Drum - Wt : 75 MTs & Dimension : OD1574 X L=8614

2. LP Drum - Wt : 17 MTs & Dimension : OD 1963 X L=13600

3. Single module Wt : 7.0 MTs (Max) & Dimension : L=18 Mtrs, W=4 Mtrs

4. Top casing : 2T (MAX) & Dimension : L= 500mm x 8.3 x 3 mtr

5. Bottom Casing : 2T (MAX) & Dimension : L=500mm x 8.3 x 3 mtr

6. Side Casing : Wt : 2 T (Max) & Dimension : 3 mtr x 6 mtr x .2 mtr

7. Chimney Shell : Wt : 10.6 MTs (Max)

NOTE: Above details are only to give a general idea to the contractor to quote the rates as per rate schedule. Contractor is required to carryout such items also within their applicable tonnage rate. Above system can regrouped / renamed or any addition / deletion can be made to make system complete. No extra claim shall be entertained on this account.

Annexure – II

LIST OF T&P BEING PROVIDED BY BHEL ON FREE OF HIRE CHARGES AND ON SHARING BASIS			
Sl. No.	**Equipment**	Capacity	**Qty.**
	Crawler crane	200T	1No.
	Crawler crane	75 / 100 T	1No.
	Mobile crane	14 /20 T	1No.
	Hydrotest pump set	250 / 400 kg	1No

NOTES:

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

2. Other terms & conditions regarding above items shall be as per clause no 37 (T & P / IMTE's)

Annexure-III

LIST OF MAJOR T&P TO BE ARRANGED BY CONTRACTOR AT HIS COST

Sl. No.	Equipment	Capacity	Qty.
1	Tyre mounted mobile crane	15 / 18T	1No.
2	Tractor trailer10 MT/Truck		1No
3	Welding equipment with accessories		As per requirement
4	Pipe bending M/c		1 No.
5	Concrete drilling machine		1 No.
6	Plasma cutting machine		1 No.

NOTES:

1. The above list specifies only major T&P (may not be complete) to be deployed by the contractor. All additional / other T&P which are required for satisfactory & timely completion of works shall be deployed by the contractor within finally accepted rate/ prices.

2. For other terms & Conditions regarding above items please refer clause 37.

Annexure—IV

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 Tenderers with stamp)

Date:

ANNEXURE-V

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……..