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TENDER NO. BHEL: NR(SCT):KOSTI:BLR:414

TENDER SPECIFICATIONS

FOR

**TENDER FOR THE WORK OF “ERECTION, TESTING, COMMISSIONING
AND TRIAL OPERATION OF BOILERS & AUXILIARIES FOR 4 X 125
MW POWER PLANT IN KOSTI, SUDAN”.**

PART I – TECHNICAL BID



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



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)
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TENDER NO. BHEL: NR(SCT):KOSTI:BLR:414

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/ DOWNLOADED COPY OF TENDER DOCUMENT COMPLETE IN ALL RESPECTS MUST BE SUBMITTED BACK (DULY SIGNED AND STAMPED) AS PART OF THE BID WITHOUT WHICH THE SAME IS LIABLE TO BE REJECTED BY BHEL.

THIS TENDER SPECIFICATION ISSUED TO:

M/S-----

INDEX

Sl. No.	CONTENTS	PAGE
1.	Tender Notice	04-05
2.	Tender Notice- Newspaper	06
3.	Procedure for submission of tender	07
4.	Project Synopsis	08
5.	Special Conditions of Contract (SCC)- Section-III “A”	09-40
6.	Special Conditions of Contract (SCC)- Section-III “B “	41-55
7.	Annexure-IA Weight Schedule (Boiler Part “A” & Part—“ B “)	56-57
8.	Annexure-IB- Weight Schedule (Piping System)	58-60
9.	Annexure-II-- List of Major T&Ps to be arranged by Contractor at his own cost	61
10.	Annexure-III— List of IMTES to be arranged by Contractor at his own cost	62
11.	Annexure-IV-- CERTIFICATE OF DECLARATION FOR CONFIRMING THE KNOWLEDGE OF SITE CONDITIONS	63
12.	Annexure—V- NON-DISCLOSURE AGREEMENT	64
13.	Annexure-VII--- RATE SCHEDULE	65
14.	General Conditions of Contract (GCC)	66-108



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Bharat Heavy Electricals Limited
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Power Sector – Northren Region (SCP),
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TENDER NOTICE

Sealed tenders are invited from the contractors fulfilling qualifying requirements for the Work of “Erection, testing, commissioning and trial operation of boilers & auxiliaries for 4 x 125 MW Power Plant in Kosti, Sudan.”

TENDER NO. BHEL: NR(SCT):KOSTI:BLR:414

QUALIFYING REQUIREMENTS:

1.1 “Tenderers who wish to participate should have executed during last seven years similar works covered in this tender for at least one boiler, of 300 TPH capacity / 67.5MW Unit and above”.

OR

“Tenderers who wish to participate should be executing works of similar nature, as covered in this tender, against BHEL’s direct order for a Boiler of 125 MW or above rating.”

1.2. The Tenderer should have a minimum average annual turnover of INR 170 Millions (Indian Rupees One Hundred Seventy Millions Only) ‘OR’ USD 4.20 Millions ‘OR’ EUROS 3.10 Millions based on the audited accounts of last three financial years (2003-04, 2004-05 & 2005-06). Bidders shall submit audited balance sheets and profit & loss account in support of this.

1.3 Tie Up/Joint Venture Arrangement

1.3.1 Tenderers are also allowed to have tie up/ Joint Venture for execution of this work. In such a case, the number of partners including the Lead Partner shall not exceed two. The composition of the Tie-up arrangement/JV and role and responsibility of each constituent must be well defined and the document submitted shall clearly indicate who shall be the lead partner. The tenderer shall give an undertaking that the responsibility of execution of entire work shall lie with the Lead Partner and also that in case of dissolution of Tie up/JV, the Lead Partner shall be liable for completing the work as per the terms of contract without any additional cost to BHEL or without affecting project schedule. Legal documents of tie up/JV agreement, signed by both the partners, shall be submitted as a part of technical bid.

1.3.2 The lead partner must meet the qualifying requirements as given at SL NO. 1.1 above.

1.3.3 For the purpose of qualifying requirements as given at SL NO. 1.2 above i.e Financial Turnover, the collective financial position of both the partners shall be considered. However, information in this regard shall be furnished individually and collectively by the tenderer.

NOTES:

- (i) The Tender Documents comprise of following;
 - (a) Special Conditions of Contract (SCC), Tender Notice, Project Synopsis, General Conditions of Contract (GCC) etc.--- **108 PAGES**
 - (b) Rate Schedule --- **4 PAGES**
- (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 04.06.2007** on payment of Rs.1,000/- (non-refundable) either in cash or by crossed demand draft in favor of BHEL, NOIDA. Request for issue of tender document should clearly indicate Tender No. and work.
- (iv) Tenders must be submitted to the undersigned **at the address mentioned above latest by 04.06.2007** before opening of technical bids commences. Technical bids shall **be opened at 16.00 Hrs. on 04.06.2007.**
- (v) **Earnest Money Deposit (EMD)** : Refundable, Non-interest bearing **EMD of Indian Rupees 2,00,000/- or US \$ 5000/- or EUROS 3650/-** shall be deposited by Account Payee Pay Order 'OR' Demand Draft in favour of "Bharat Heavy Electricals Limited" payable at Delhi, INDIA. Those bidders who have already deposited ' One Time 'EMD' of Rs. 2,00,000/- with BHEL, PSNR, NOIDA need not submit EMD with the present tender.
- (vi) Tenders not accompanied with Full Earnest Money Deposit, as indicated above, will not be considered.
- (vii) **All corrigenda, addenda, amendments and clarifications to this Tender will be hosted in this web page and not in the newspaper. Bidders shall keep themselves updated with all such amendments.**
- (viii) BHEL reserves the right to accept or reject any or all tenders without assigning any reason whatsoever.
- (ix) BHEL takes no responsibility for any delay/loss of documents or correspondences sent by courier/post.
- (x) Purchase Preference will be given to CPSUs as per Indian Govt. Guidelines.

AGM/SCP



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Sub-Contract and
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TENDER NOTICE-- Newspaper

LAST DATE OF SALE : 04.06.2007
DUE DATE : 04.06.2007
DATE OF OPENING : 04.06.2007

NIT NO. / NAME OF WORK

TENDER NO. BHEL: NR(SCT):KOSTI:BLR:414

SEALED TENDERS ARE INVITED FROM THE CONTRACTORS FULFILLING QUALIFYING REQUIREMENTS FOR THE **WORK OF “ERECTION, TESTING, COMMISSIONING AND TRIAL OPERATION OF BOILERS & AUXILIARIES FOR 4 X 125 MW POWER PLANT IN KOSTI, SUDAN.”**

NOTES:

1. Purchase Preference will be given to CPSU as per Indian Govt. Guidelines.
2. The complete tender documents can be downloaded from BHEL Web Site, www.bhel.com.
3. Bidder(s) can also purchase hard copy of the tender documents from this office on payment of Rs.1,000/- (non-refundable) either in cash or by crossed demand draft in favour of BHEL, NOIDA.
4. **Earnest Money Deposit (EMD)** : Refundable, Non-interest bearing **EMD of Indian Rupees 2,00,000/- or US \$ 5000/- or EUROS 3650/-** shall be deposited by Account Payee Pay Order 'OR' Demand Draft in favour of “Bharat Heavy Electricals Limited” payable at Delhi, INDIA. 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

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

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 specifications & Special terms and conditions” (Part-I) issued by BHEL/ downloaded from BHEL website 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/ downloaded from BHEL website.

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

PROJECT SYNOPSIS

Kosti Thermal Power Project to be constructed is a greenfield project with 4x125 MW Thermal units having gas/oil fired boilers & aux., steam turbine generators & aux., BFPs, switchyard etc. to be executed on EPC basis by BHEL at Sudan. The owner of the Project is National Electricity Corporation(NEC), Sudan, which is a Govt. of Sudan entity. The plant will supply electricity to South & West Sudan.

Kosti lies south of Khartoum (Capital of Sudan) on an Asphalt road with latitude 13.10 N and longitude 090.14E. The Kosti site is centrally located just 350 KM south of Khartoum. The river Nile is passing near by and the site has easy connectivity by road and rail.

Distance of project site from Port of Sudan (only port in Sudan) is 1200 km and the project site is about 600 Mtrs. from Highway.

Temperature Data:

- (a) Maximum ambient temperature : 45 Deg C
- (b) Minimum ambient temperature : 16 Deg C

Mean(Design) annual humidity:

- (a) Maximum 71% in August
- (b) Minimum 26% in April

Wind Data:

- (a) Maximum speed of wind 11 Km/h
- (b) Wind direction is Southern (May to September) and Northern in the rest of the year.

SECTION - III `A'

SPECIAL CONDITIONS OF CONTRACT

INDEX

CLAUSE No.	DESCRIPTION
34.	General
35.	Civil works, foundation and grouting
36.	Consumables
37.	Tools & Plants / IMTE's
38.	Supervisory staff & workmen
39.	Material handling and storage
40.	Preservation of components
41.	Erection
42.	Welding HT, RG and NDT
43.	Application of Insulation and refractory
44.	Testing, Pre-commissioning, commissioning and post-commissioning.
45.	Finish Painting
46.	Progress reporting
47.	Drawings and documents
48.	Taxes and Duties
49.	Extra work
50.	Price variation
51.	Rate schedule
52.	Instructions to tenderers

SECTION - III `A`**SPECIAL CONDITIONS OF CONTRACT****34.0 GENERAL**

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

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

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

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

- a** Provision, as required, of all types of labour, supervisors, engineers, watch and ward, tools & tackles, calibrated inspection, measuring and testing equipment as specified and otherwise required for the work, consumables for erection, testing and commissioning 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 performance of the equipment.
- e** Repair and rectification.
- f** Preservation / Re-conservation of all components during storage / erection / commissioning till handing over.

34.5 **BHEL-Power Sector (NR) is an ISO 9001-2000, ISO 14001-1996 and OHSAS 18001-1999 certified company. Quality of work, to customer's satisfaction and system requirements is the essence of these certifications. The contractor in all respects will organize his work, systems, environment, process control documentation, tools, plant, inspection, measuring and testing equipments etc. as per instructions of BHEL engineer.**

The contractor shall also comply with applicable legislation and regulations with regards to Health, Safety and Environmental aspects for minimizing risk arising from occupational health & safety hazards, controlling pollution and wastage. The Contractor will be responsible for Health, Safety & Environment management (HSE) at site for the construction activities to be carried out by them in accordance with requirements given under section I (a) of GCC and

elsewhere in this tender document. The contractor, who is awarded the work, shall have to sign an MOU w.r.t implementation of HSE conditions with BHEL (Safe Work Practices).

- 34.6** **Apart from IBR, the contractor has to follow Sudanese Boiler regulations also. While BHEL will pay the inspection fees of the Boiler/ Electrical Inspectorate, all other arrangements for the periodical visits of Boiler/ Electrical Inspector to site, inspection certificates etc. will have to be made by the contractor at his cost. The contractor will also meet all expenses in connection with his welder's qualification/ re-qualification tests.**
- 35.0** **CIVIL WORKS, FOUNDATIONS AND GROUTING.**
- 35.1** BHEL shall provide foundations for all the equipment and columns including their grouting and necessary other civil work. The contractor for their scope shall check the dimensions of the foundations, locations of pockets, pitch of anchor bolts and other inserts as per drawings. Further, top elevation of foundations shall be checked with respect to benchmark etc. All minor adjustments of foundation level, dressing and chipping of foundation surfaces up to 50 mm, enlarging the pockets in foundations etc., as may be required for the erection of equipment / plants shall be carried out by the contractor. It may be noted that the foundation materials as well as the portions of the Boiler columns which would be concreted at site, (which are normally left unpainted) shall be supplied with a temporary sea-worthy coating, which should be capable of being removed easily at site. This coating needs to be removed (by using Any one of the Organic Solvents like acetone / Trichloroethylene / toluene / xylene and by suitable rubbing with cotton cloth) at site before these components are erected and concreted to ensure proper load transfer.
- 35.2** While on the job, care is essential to avoid too much chipping and resultant lowering of level. In case of excess chipping, contractor has to arrange additional packing plates as per requirements provided BHEL Engineer allows it. When required by manufacturers, the embedded sub-sole plates shall be scraped and checked with prussian blue to get the required contact with frames.
- 35.3** The contractor shall ensure perfect matching of packer plates including machining, scraping and blue matching with foundation by dressing the foundation, as well as perfect matching between the packer plates and the base plate of equipment to the satisfaction of BHEL Engineer. If required the packer plates may have to be aligned and fixed on the foundations using approved quality special high strength, non-shrinking and quick-setting grouts. The minimum thickness below the packer plate should be 20 mm. The material required for this has to be arranged for by the contractor at his cost.
- 35.4** Entire grouting work of foundation bolt grouting, base plate grouting etc. including materials will be carried out by another agency carrying out Civil work . Contractor for subject work has to offer neat & clean foundations to the Civil Contractor to ensure perfect grouting. While grouting will be carried out by other agency, the contractor has to ensure that all the matching joints which are not to be grouted shall be kept free from the grouting mixture by applying tape or any other alternative method approved by Engineer. All assistance required has to be provided by the contractor.
- 35.5** The contractor shall check and verify the alignment of equipment, alignment of shafts of rotating machinery, the slopes of all bearing pedestals, centering of rotors with respect to their sealing bores, couplings etc. as applicable and the like items to ensure that no displacement had taken place during grouting. The values recorded prior to grouting shall be used during post grouting check up and verifications. Such pre and post grout records of alignment details shall be maintained by the contractor in a manner acceptable to the Engineer.

- 35.6** Any civil works required for safe and efficient operation of tools and tackles like grouting / excavation/ casting of foundation / anchor points for derricks, winches, guy ropes fastening, etc and any other temporary supports shall also be the contractor's responsibility. For these civil works, all materials including cement and required facilities shall have to be arranged by contractor at his own cost.
- 36.0 CONSUMABLES**
- 36.1** The contractor shall provide within finally accepted price / rates, all consumables like all welding electrodes (including alloy steel and stainless steel filler wires), TIG / P91 filler wires (over & above as supplied by the unit along with the plant materials, which will be given free of cost to bidder), all gases (inert, welding, cutting), soldering material, dye penetrants, radiography films. Other erection consumables such as tapes, jointing compound, grease, mobile oil, M-seal, Araldite, petrol, CTC / other cleaning agents, grinding and cutting wheels are to be provided by the contractor. Steel, H&S, packers, shims, wooden planks, scaffolding materials hardware items etc required for temporary works such as supports, scaffoldings are to be arranged by him. Sealing compounds, gaskets, gland packing, wooden sleepers, for temporary work, required for completion of work except those which are specifically supplied by manufacturing unit are also to be arranged by him.
- 36.2** All the shims, gaskets and packing, which go finally as part of equipment, shall be supplied by BHEL free of cost.
- 36.3** It shall be the responsibility of the contractor to plan the activities and store sufficient quantity of consumables. Non-availability of any consumable materials or equivalent suggested by BHEL cannot be considered as reason for not attaining the required progress or for additional claim.
- 36.4** In case of TIG/P91 filler wires, required quantity as arrived at by calculation / standards will only be supplied. It would be the contractors' responsibility to account for the consumption of these filler wires. Additional consumption beyond standard / calculated quantity will be at cost recovery basis only unless and otherwise accounted for. Surplus quantity of TIG filler wire, if any, shall be properly stored and returned to BHEL stores.
- 36.5** It shall be the responsibility of the contractor to obtain prior approval of BHEL, regarding suppliers, type of electrodes etc before procurement of welding electrodes. On receipt of electrodes at site these shall be subjected to inspection and approval by BHEL. The contractor shall inform BHEL details regarding type of electrodes, batch number, date of expiry etc and produce test certificate for each lot / batch with correlation of batch / lot number with respective test certificate. No electrode without a valid test certificate will be used.
- 36.6** BHEL reserves the right to reject the use of any consumable including electrodes, gases, lubricants / special consumables if it is not found to be of the required standard / make / purity or when shelf life has expired. Contractor shall ensure display of shelf life on consumable wherever required and records maintained.
- 36.7** Storage of all consumables including welding electrodes shall be done as per requirement / instruction of the Engineer by the contractor at his cost.
- 36.8** In case of improper arrangement for procurement of any consumable, BHEL reserves the right to procure the same from any source and recover the cost from the Contractor's first subsequent bill at market value plus the departmental charges of BHEL from time to time (30% at present). Postponement of such recovery is normally not permitted. The decision of Engineer in this regard shall be final and binding on the Contractor.

- 36.9** All lubricants and chemicals required for cleaning, pre-commissioning, commissioning, testing, preservation and lubricants for trial runs of the equipment shall be supplied by BHEL / BHEL's client. All services including labour and T&P will be provided by the contractor for handling, filling, emptying, refilling etc. the consumption of lubricants / chemicals shall be properly accounted for. Surplus material if any shall be properly stacked and returned to BHEL/ CUSTOMER stores at no extra cost to BHEL. BHEL reserves the right to recover costs for wastage by the contractor.
- 36.10** Transportation of oil drums, from stores, filling of oil and filling of oil for flushing, first filling of oil and subsequent changeover or topping / making up till the unit is fully commissioned and handed over to customer is included in scope of this contract. The contractor shall have to return all the empty drums to BHEL / BHEL's client store at no extra cost. Any loss / damage to above drums shall be to contractor's account.
- 36.11** **All charges on account of Octroi, terminal or sales tax and other duties on materials obtained for the works from any source shall be borne by the contractor.**
- 37.0** **TOOLS AND PLANTS / IMTE's**
- 37.1** All 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 in working condition. **BHEL shall not provide any T&P including crane.**
- 37.2** **Modern construction equipments & IMTEs** are required to be used as per international practices. Indicative lists of T&Ps and IMTEs to be arranged by the contractor are given **as per Annexure-II & and Annexure-III.** He should ensure that these are in good working condition. In the event of the failure of contractor to bring necessary and sufficient T&Ps and IMTEs, BHEL will be at liberty to arrange the same and hire charges or total cost as applicable along with overheads 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** The area and infrastructure development of the 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.
- 37.5** Contractor shall ensure deployment of serviced and healthy T&Ps including cranes, lifting tackles, wire ropes, manila ropes, winches and slings etc. History card and maintenance records for major T&Ps will be maintained by the contractor and will be made available to BHEL Engineer for inspection as and when required. Fitness certificate / Test Certificates of T&Ps shall have to be submitted before it is put in use. Identification for such T&Ps will be done as per BHEL Engineer's advice.
- The Contractor shall ensure that only new equipments are deployed for slings upto 20 mm and lifting tackles upto 3 MT capacity .
- 37.6** Contractor shall ensure deployment of reliable and calibrated IMTEs (Inspection, measuring and testing equipments). The IMTEs shall have test / calibration certificates from authorized / Government approved / accredited agencies traceable to National / International standards. Each IMTE shall have a label indicating calibration status i.e. date of calibration, calibration agency and due date for calibration. A list of such instruments deployed by contractor at site with its calibration status is to be submitted to BHEL Engineer for control.

- 37.7** Re-testing / re-calibration shall also be arranged at regular intervals during the period of use as advised by BHEL Engineer within the contract price. The contractor will also have alternate arrangements for such IMTE so that work does not suffer when the particular instrument is sent for calibration. If any IMTEs not found fit for use, BHEL shall have the right to stop the use of such item. It will be necessary for the contractor to deploy proper item. Any readings taken by the defective instrument will be recalled and repeat the readings taken by that instrument with a proper one. In case he fails to do so, BHEL may deploy IMTEs and retake the readings at contractor's cost.
- 37.8** BHEL shall have lien on all T&P, IMTEs and other equipment of the contractor brought to the site for the purpose of erection, testing and commissioning. BHEL shall continue to hold the lien on all such items throughout the period of contract / extended period. The contractor and / or his sub-contractors, without the prior written approval of the Engineer, shall remove no material brought to the site.
- 37.9** 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 workmen like millwright fitters, welders, crane operators, drivers, gas cutters, riggers, sarangs, masons, carpenters, electricians, helpers and instrument technicians to carry out the works as per specifications. In addition to skilled, semi-skilled and unskilled workmen required for all the works, suitable workmen required for handling and transporting of equipment from site storage to erection site, erection, testing and commissioning as contemplated under this specification shall be deployed. Only fully trained and competent men with previous experience on the job shall be employed. They shall hold valid certificates wherever necessary.
- BHEL reserves the right to decide on the suitability of the workers and other personnel who will be deployed by the contractor. BHEL reserves the right to insist on removal of any employee of the contractor at any time, if they find him unsuitable and the contractor shall forthwith remove him. **Such person shall not again be employed for the purpose of or in connection with the Contract without the written permission of BHEL and/or its Customer(M/s NEC). Any person so removed shall be replaced as soon as possible by a competent substitute with information to BHEL and/or its Customer(M/s NEC)**
- 38.2** The supervisory staff including qualified Engineers deployed by the contractor shall ensure proper out-turn of work and discipline on the part of the labour put on the job by the contractor. They should in general see and ensure that the works are carried out in a safe and proper manner and in coordination with other labour and staff deployed directly by BHEL or other contractors of BHEL or BHEL's client / other agency.
- 38.3** The work shall be executed under the usual conditions affecting major power plant construction and in conjunction with numerous other operations / activities at site. The contractor and his personnel shall cooperate with other personnel / contractors, coordinating his work with others and proceed in a manner that shall not delay or hinder the progress of work as a whole.
- 38.4** The contractor's supervisory staff shall execute the work in the most substantial and workman like manner in the stipulated time. Accuracy of work and aesthetic finish are essential part of this contract. The contractor shall be responsible to ensure that assembly and workmanship conforms to the dimensions and tolerances given in the drawings / documents / instructions

given by BHEL Engineer from time to time.

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

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

38.7 During the course of erection,

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

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

38.8 If the contractor or his workmen or employees shall break, deface, injure or destroy any part of a building, road kerb, fence, enclosure, water pipes, cables, drains, electric / telephone poles, wire, trees or any other property or to any part of erected components, the contractor shall make the same good at his own expense. In default, BHEL may cause the same to be made good by other workmen or by other means and deduct the expenses from any money due to the contractor. BHEL's decision will be final and binding.

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

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

38.11 The Contractor shall appoint a Project Manager in India for the project, being the responsible representative of the Contractor in charge of managing the Works and liaison with BHEL / Customer (M/s NEC) and / or their Consultant M/s. Fichtner.

From the commencement of construction activities at site, Contractor shall appoint a suitable person as the Incharge (hereinafter referred to as "Site Incharge". The Site Incharge shall be present at the site throughout normal working hours except when on leave, sick or absent for reasons connected with proper performance of the contract. Whenever the Site Incharge is absent from the site, a suitable person shall be appointed to act as his or her deputy.

The BHEL Engineer shall have full powers to instruct the Contractor to arrange for immediate termination of services, in connection with this contract, of any Agent, servant or employee whose continued employment is, in his opinion, undesirable, without assigning any reason

- 38.12** It shall be the responsibility of the Contractor to pay salaries and other benefits to its employees/personnel engaged by it as per the agreement with them, and in keeping in line with the local laws in Sudan. The Contractor shall submit to Construction Manager, BHEL Site, Kosti, Sudan regularly, the details/statement of wages paid to its workers in India/back home, besides wages paid in Sudan.
- 38.13** All traveling and transportation expenses including air fares etc shall be borne by the Contractor for all his employees. The Contractor shall also bear air fare and other expenses for those employees sent back to their place on account of misconduct, disobedience, improper behavior, sickness, unsatisfactory work or any other reason whatsoever.
- 38.14** Contractor shall arrange passports for all his staff and labour. BHEL will assist Contractor for issue of visas including multi-entry visas and other permits as per requirement for the job. However, the Contractor shall arrange for attestation of certificates and other documents required for travel arrangements, medical tests as applicable and comply with other formalities. All expenses for all these activities will be borne by the Contractor.
- 38.15** The delay in obtaining the passports and other travel documents or compliance with the various formalities for the deputation of the contractor's personnel shall not absolve the contractor from his obligations under the Contract including completion of the work strictly in accordance with the time schedule.
- 38.16** The Contractor shall in all dealings with persons in his employment have due regard to all recognised festivals, days of rest/weekly off, and religious or other customs in Sudan and shall make special arrangements whenever the exigencies of the construction program demand that work shall proceed during such festivals and days of rest
- 38.17** The Contractor shall plan and schedule the activities on Site such that they happen strictly during the specified working hours.
The Contractor shall not otherwise than in accordance with Sudanese State Laws import, sell, give, barter, or otherwise dispose of any alcoholic liquor or drugs or any arms or ammunition to any person or persons whatsoever, nor permit or suffer any such importation, sale, gift, barter, or other disposal by his employees. The Contractor shall submit a request to BHEL for issue of an identity card to each and every person employed at the Site by him along with passport size photographs and other documents as may be required for the purpose. No person will be allowed to enter the project premises without an identity card. All identity cards will be surrendered by the Contractor to BHEL in respect of each person on completion of assignment of such person.
- 38.18** The Contractor shall deliver to BHEL before 10:00 hrs on each first working day of the week; a report in detail, in such form as BHEL or its Customer (M/s NEC) may prescribe, showing the supervisory staff and the numbers of the several classes of labour, from time to time employed by the Contractor on the Site. The Contractor shall at all times take all requisite precautions and use his best endeavors to prevent any riotous or unlawful behavior by or amongst the labourers and others employed by him for the purpose of or in connection with the Contract and for the preservation of the peace and the protection of the inhabitants and the security of property on or in the neighborhood of the Site.
- 38.19** The Contractor shall in collaboration with, and to the requirements of, any duly constituted medical or sanitary authority, ensure that suitable arrangements are made on the Site for the maintenance of health, the prevention and overcoming of epidemics, and for adequate first-aid, welfare, and hygiene services. The Contractor, his partners, foreign workers and employees and their families shall not be involved by any manner in any political activity during their residence in the Employer's country.

39.0 MATERIAL HANDLING AND STORAGE

- 39.1** All the equipments/materials furnished under this contract shall be received from the project stores, sheds / storage yards and transported to pre assembly area / erection site and stored in the storage spaces in a manner so that they are easily retrievable till the contractor erects them. **While drawing lifting material from BHEL / customer stores, the contractor shall ensure that the balance / other materials are stacked back immediately. No claim is admissible on this account**
- 39.2** While BHEL will endeavor to store / stack / identify materials properly in their open / close / semi closed / tarpaulins covered storage yard / shed, it shall be contractor's responsibility to assist BHEL in identifying materials well in time for erection. They should take the delivery of the same, following the procedure indicated by BHEL, and transport the material safely to pre-assembly yard / erection site in time, according to program.
- 39.3** The contractor shall take delivery of components, equipment / consumables from storage area after getting the approval of BHEL Engineer on standard indent forms.
- 39.4** The contractor shall identify and deploy necessary Engineers / supervisors / workmen for the above work in sufficient number as may be needed by BHEL, for areas covering their scope.
- 39.5** All the equipment shall be handled very carefully to prevent any damage or loss. No untested wire ropes / slings etc. shall be used for unloading / handling. The equipment shall be properly protected to prevent damage either to the equipment or to the floor where they are stored. The equipment from the stores shall be moved to the actual location at the appropriate time so as to avoid damage of such equipment at site.
- 39.6** Contractor shall ensure that while lifting slings shall be put over the points indicated on the equipment or as indicated in the manufacturer's drawings. Slings / shackles of proper size shall be used for all lifting and rigging purposes. All care shall be taken to safe guard the equipment against any damage. Dragging of piping / valves should be avoided. In case of any damage the cost shall be covered from the contractor.
- 39.7** Approach road conditions from the stores / yards to the erection site may not be equipped and ideal for smooth transportation of the equipment. Contractor may have to be adequately prepared to transport the materials under the above circumstances without any extra cost. . The contractor may familiar himself with soil conditions at site.
- 39.8** Contractor shall be responsible for examining all the plant and materials issued to him and notify the Engineer immediately of any damage, shortage, discrepancy etc before they are moved out of the stores / storage area. The contractor shall be solely responsible for any shortages or damages in transit, handling, storage and erection of the equipment once received by him. As the erection work will be spread in different areas / locations of the project, contractor has to arrange sufficient number of watch / ward personal to avoid any pilferage of material. As per General Conditions of contract under provisions of clause No 29 BHEL will reserve the right to recover the cost of repair / replacement, if any, to bring back the equipment in original order, in case the equipment / material is lost / damaged while in the custody of the contractor. BHEL's decision in this regard shall be final and binding on the contractor.
- 39.9** The contractor shall maintain an accurate and exhaustive record-detailing out the list of all equipment received by him for the purpose of erection and keep such record open for the inspection of the engineer at any time.

- 39.10** All the material in the custody of contractor and stored in the open or dusty locations must be covered with suitable weather proof / fire retardant covering material wherever applicable and shall be blocked up on raised level above ground. All covering materials including blocks and sleeper shall be arranged by the contractor at his cost.
- 39.11** If the material belonging to the contractor are stored in area other than those earmarked for his operation the engineer will have the right to get it moved to the area earmarked for the contractor at the contractors risk and cost.
- 39.12** The contractor shall be responsible for making suitable indoor storage facilities to store all equipment (drawn by the contractor from BHEL / customer stores), which require indoor storage till the time of their installation. The Engineer will direct the contractor in this regard, which item in his opinion will require indoor storage, and the contractor shall comply with Engineer's decision.
- 39.13** The contractor shall ensure that all surplus / damaged / scrap / unused material, packing wood / containers/ special transporting frames etc are returned to BHEL at a place in project area identified by the Engineer. The contractor will maintain an account for all items received and returned to BHEL. Any shortage in returning such items shall be chargeable to the contractor except for a 5% allowable against wastage for packing wood only.
- 39.14** The contractor shall hand over all parts / materials remaining extra over the normal requirement with proper identification tags to the stores as directed by the concerned BHEL engineer.
- 39.15** The contractor shall ensure that all the packing materials and protective devices installed on equipment during transit and storage are removed before installation.
- 39.16** It shall be the responsibility of the contractor to keep the work / storage areas in neat, tidy and working conditions. All surplus/unusable packing and other materials shall be removed and deposited at location(s) specified by BHEL within the project premises. If required weighing of the same within the project premises will have to be carried out.
- 40.0** **PRESERVATION OF COMPONENTS**
- 40.1** After taking delivery from BHEL / customer's stores, plant materials storage shall be subjected to the following protection besides other provisions indicated in these specifications elsewhere.
- a) Items stored outdoors shall be blocked up at least six inches (6") off the ground . He should have sufficient numbers of wooden / concrete / steel sleepers for the job.
 - b) Motors, valves, electrical equipment, control equipment and instruments etc shall be stored indoors in a warehouse provided by contractor. Motor windings shall be kept dry by use of external heat or space heaters.
 - 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/ damaged.
- 40.2** It shall be the responsibility of the contractor to apply preservatives / touch up paints (primer) on equipment handled and erected by him till such time of final painting. It shall be contractor's responsibility to arrange for required paints (primer), thinners, labour, scaffolding materials, cleaning materials like wire brush, emery sheets, etc, cleaning of surface and provide one coat of preservatives / paints (primer) from time to time as decided by BHEL engineer. The accepted rate shall include this work also. It is to be noted that such painting may have to be done as and when required till such time the final painting is carried out.

- 40.3** The contractor shall effectively protect the finished work from action of weather and from damage or defacement and shall cover the finished parts then and there for their protection.
- 40.4** Any failure on the part of contractor to carry out works according to above clauses will entail BHEL to carry out the job from any other party and recover the cost from contractor.
- 41.0** **ERECTION**
- 41.1** All normal erection and assembly techniques necessary for completion of works under this specification and magnitude have to be carried out. It is not possible to specifically list out all of them. Absence of any specific reference will not absolve the contractor of his responsibility for the particular operation. These would include,
- Scaffolding and rigging operations,
 - Machine / flame / electric cutting, grinding, welding, radiography and stress relieving
 - Fitting, fettling, filing, straightening, chamfering chipping, scrapping, reaming, as cleaning, checking, leveling, blue matching, aligning and assembly.
 - Machining, surface grinding, drilling, doweling, shaping
 - Temporary erections for alignment, dismantling of certain equipment for checking, cleaning, servicing and site fabrication.
- 41.2** Any fixtures, scaffolding materials, approach ladder, concrete block supports, steel structures required for temporary supporting, pre-assembly or checking, welding, lifting and handling during pre-assembly and erection shall be arranged by contractor at his cost.
- 41.3** No members of any ladder / structure / platform should be cut without specific approval of BHEL. In case it is necessary to cut, the contractor shall rectify / repair in a manner acceptable to BHEL / customer without any additional cost.
- 41.4** The contractor shall erect scaffolding / temporary platforms for erection. These should be of adequate capacity and shall never be over loaded. These should be replaced when not found suitable during erection work and dismantled on work completion and removed from work site.
- 41.5** It shall be the responsibility of the contractor to provide ladders on columns for initial work till such time stairways are completed. For this, the ladder should not be welded on the column and should be pre-fabricated clamping type ladders. No temporary welding on any structural member is permitted except under special circumstances with the approval of BHEL. In case it is absolutely necessary then the contractor shall cut the temporary structure and rectify the column as directed by the engineer.
- 41.6** The contractor is strictly prohibited in using the Boiler / ESP / Auxiliary Components for any temporary supporting or scaffolding works etc. In case of such misuse a sum of determined by Engineer will be recovered from contractor's bills.
- 41.7** Boiler auxiliary columns are plate formed box section and the erection joint is welded type where as the columns are butt type with HSEFG bolted flange and partition plates, boiler main column are having flange with splice plates and bolted connections. However, the contractor has to carry out work at site as per drawing.
- 41.8** The material for platform section weight approx. 200 MT under PG-36 shall be supplied in running meters. These shall be cut to size / shape / fabricated to required size / shape and to be welded by contractor.
- 41.9** Certain adjustment in length may be necessary while erecting pipelines / ducts / casings etc. The contractor should remove the extra lengths / add extra lengths to suit the final layout after preparing edges afresh by adopting specified heat treatment procedures.

- 41.10** Economizer, super-heaters, re-heater coils, burner panels may have to be hydraulically tested individually, if required, before erection as instructed by BHEL Engineer within finally accepted rates.
- 41.11** Suspensions for ducting will be supplied in running lengths, which shall be cut to size and adjusted as required. Ducts / expansion bellows are dispatched to site in loose walls plates / pieces and these are to be assembled and welded at site along with stiffeners etc., before erection within the finally accepted rates. All joints connecting duct expansion piece and dampers shall be seal welded on inside as well as on outside.
- 41.12** Assistance in mechanical work associated with the power cylinders, valves, valve actuators etc., coming under various groups shall be provided by contractor within the finally accepted rates.
- 41.13** Hanger rods are shown in the pressure parts arrangement drawings for boiler. Any cutting / welding of these hangers rods will be done by the contractor. The hangers for pressure parts will be tested for even distribution of load with the help of a torque wrench.
- 41.14** The headers are provided with hand holes. The contractor, shall as per requirement, carry out removal and re-fixing of hand hole plates within finally accepted rates.
- 41.15** Burner tilt mechanism will be checked for freeness, serviced and adjusted, if necessary to obtain optimum tilt before installation.
- 41.16** Skin casing sheet for covering the boiler roof panels, rear arch tube and other areas will be supplied by BHEL. Any cutting, addition and re-fabrication to suit the site conditions shall be carried out within the finally accepted rates.
- 41.17** ESP collecting electrodes may require straightening and repair due to minor transport damages before erection and spot heating in position to get correct alignment and same will be carried out by the contractor at no extra cost.
- 41.18** The contractor shall carry out trial run of all motors including checking the direction of rotation in the uncoupled condition. Checking of alignment and re-coupling of the motor to the driven equipment as per instructions of BHEL engineer and to their satisfaction.
- 41.19** The contractor shall fabricate pipe, special bends etc., threading and welding as required for installing lube oil system and carry out the acid cleaning of the fabricated piping. The contractor shall also service the lube oil system, carrying out the hydraulic test of oil coolers etc.
- 41.20** Contractor shall carry out kerosene testing of all bearing housings of various rotating equipment like pumps, fans etc., as per BHEL engineer's instructions. Performance of hydro test of oil coolers of rotating machines and hydro test of SCAPH and other equipment as per BHEL engineer's instructions is included in the scope of work.
- 41.21** Forced lube oil system of motors or rotating equipment form parts of the work under this specification.
- 41.22** Certain rotating machinery after initial runs and commissioning of the equipment have to be hot aligned as per the instructions of BHEL engineer. Cleaning air pre-heater, fans, boiler ducting etc., free of extraneous steel, scaffolding materials electrodes, all foreign materials etc., before trial run of rotating machinery, and at various stages of pre-commissioning activities as per BHEL engineer's instruction, is within the scope of work.
- 41.23** Some of the rotating equipment and electrical motors are provided with protective greases only. Contractor shall arrange for cleaning of the same with kerosene or some other reagent. If necessary, dismantling some of the parts of the equipment would be necessary. He shall arrange for re-greasing / lubricating them with recommended lubricants and for assembling back the dismantled parts, at quoted rate. Lubricants will, however, be supplied free of cost

by BHEL.

- 41.24** After initial trial of rotating equipment, control and power cabling for motors and other equipment / instrumentation shall have to be disconnected for checking alignment and re-setting / re-alignment / hot alignment. Contractor shall have to arrange for disconnecting control and power cabling as per BHEL engineer's instructions and clearance and reconnect the control and power cabling after realignment. Quoted tonnage rate shall be inclusive of the above.
- 41.25** Packer plates supplied may have to be machined to the correct dimensions. It may also be necessary to blue match the same with each other/ with equipment / with foundations as per BHEL instructions.
- 41.26** Contractor shall arrange changing of preservative oil in the gearboxes, journal and other bearing assemblies of rotating equipment when in storage areas or after erection of equipment as the case may be as per the instructions of BHEL engineer. Necessary lubricants / oil will be supplied by BHEL and the same will be drawn by contractor from BHEL / customer's stores and transporting to site. **No additional payment will be made for such works** even though supply of lube oil might have been made under regular dispatchable unit (DU) number against product group main assembly (PGMA) and appearing in the shipping list. Prior to the commissioning of the equipment, oil should be drained and collected in drums provided by BHEL and returned to BHEL / customer's stores.
- 41.27** The air-preheater rotor may be disturbed during the initial operation. This may change the original clearances. It requires rechecking and correction of seal clearances. Contractor shall carry out such checks and resetting of clearances as per the instructions of BHEL engineer. The resetting may have to be repeated till satisfactory results are obtained.
- 41.28** Checking of air gaps and adjustment of stator / rotor for magnetic center of HT motors shall be carried out as part of erection.
- 41.29** The fans & other rotating machines shall be checked for clearances and other vital tolerances. The IGV unit shall be serviced. Necessary assistance for balancing of equipment during trial run, if required, shall be provided by the contractor free of cost.
- 41.30** Complete penetration of water wall (Panel to Panel) welding shall be achieved either by one side or both sides welding.
- 41.31** Whenever required the contractor shall arrange for pre-qualification of process task performers.
- 41.32** All attachments welding including those for insulation works coming on pressure parts / non-pressure parts which the contractor has erected shall be done by IBR / BHEL tested welders only.
- 41.33** All electrical cabling including proper glanding, termination, dressing etc., control and instrumentation works required for completion of Electrostatic Precipitator including its commissioning shall be part of this work. This will include erection of all electrical equipment such as rectifier, transformers, and power supply and control panel, laying of trays and cables and other associated equipment.
- 41.34** All rotating machines and equipment shall be cleaned, lubricated, checked for their smooth rotation, if necessary by dismantling and refitting before erection. If, in the opinion of Engineer, the equipment is to be checked for clearance, tolerance at any stage of work or during commissioning period, all such works are to be carried out by contractor at his cost.
- 41.35** All the shafts of rotating equipment shall be properly aligned to those of the matching equipment within design tolerances All bearings, shafts and other rotating parts shall be thoroughly cleaned and suitably lubricated before starting.

- 41.36** All the motors and equipment shall be suitably doweled after alignment of shafts with taper / parallel machined dowels as per the direction of the Engineer. Dowel pins required are be machined by the contractor at his own cost. However the materials for dowel pins shall be issued by BHEL free of cost.
- 41.37** The HT motor bearings shall be blue matched at site and checked for bearing clearances. The contractor if required shall carry out scraping of bearing housing. No extra claim for blue matching up to 1mm initial gap will be entertained.
- 41.38** The contractor at no extra cost to BHEL shall carry out servicing and realignment of skid mounted equipment.
- 41.39** Certain instruments like pressure gauges, pressure transmitters, temperature gauges, flow switches and indicators, etc., are received in assembled condition as integral part of equipment. Contractor shall be responsible for safe receipt, installation and custody of these instruments supplied mounted on skids / equipment. The calibration of skid / equipment mounted instruments shall be arranged by BHEL through other agency engaged for C&I. Contractor will be informed by BHEL engineer about the details of C&I agency. The contractor shall coordinate with the C&I agency for removal, calibration and re-installation of the instruments. Though C&I agency will remove and reinstall the instruments after calibration, the contractor for this package will maintain the list of all the instruments removed & reinstalled. Instruments prior to removal and after reinstallation shall be considered in custody of the contractor for this package. All instruments such as pressure gauges / temperature gauges, switches etc. forming part of product group (PG) are under the erection scope of this contract and shall be installed and commissioned by the contractor of this package at no extra cost to BHEL. However the calibration of these instruments shall be done by C&I agency as above
- 41.40** All electrical panels, control gears, motors and such other devices shall be properly dried by heating to improve IR valve, before they are energized. Bearings, slip rings commutators and other exposed parts shall be protected against moisture ingress and corrosion during storage and periodically inspected.
- 41.41** The contractor shall completely erect and test all the piping systems, covered in the specification including sampling lines up to and including sample coolers, hangers & supports, valves and accessories in accordance with the drawings furnished. This includes all necessary bolting, welding, pre-heating, stress relieving, testing, cleaning and painting. System shall be demonstrated in condition to operate continuously in a manner acceptable to the Engineer. Welding shall be used throughout for joining pipes except where flanged, screwed or other type joints are specified or shown on the drawings. All piping shall be erected true to the lines and elevation as indicated in the drawings.
- 41.42** **For non-critical piping systems (except MS, CRH, HRH, HP Bypass , LP Bypass , BFD piping), The pipes shall be supplied, alongwith necessary attachments as loose, un-fabricated in running lengths without beveling. It shall be responsibility of contractor to carry out fabrication by cutting to size, bevel / prepare edges, fabricate support pads, drill holes for drains, vents and other stubs, welding, carryout NDT & SR as per site requirement & as directed by BHEL, within finally accepted unit rates.**
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.
- 41.43** The contractor shall ensure lowering of pipes in position with adequate precautions as to avoid any damage to either material or men. Only the anchoring points earmarked for the

purpose of lowering the pipes are to be used.

- 41.44** It is possible that a few flanges may not be matching. The contractor shall be required to cut and re-weld the same as and when required without any additional cost.
- 41.45** Wherever piping erected by the contractor is connected to equipment / piping erected by the other agencies the joint at the connecting point shall be the responsibility of the contractor who is erecting the piping under this specifications.
- 41.46** Normally the high-pressure valves will have prepared edges for welding. But, if it becomes necessary, the contractor will prepare new edges or recondition the edges by grinding or chamfering to match the corresponding tubes and pipes within the scope of the work.
- 41.47** All fittings like `T'-pieces, weld neck flanges, reducers etc., shall be suitably matched with pipes for welding. The valves will have to be checked, cleaned or overhauled in full or in part before erection after chemical cleaning and during commissioning.
- 41.48** The contractor shall be responsible for correct orientation of all valves so that seats, stems and hand wheels will be in desired location. It is the responsibility of the contractor to obtain the information regarding orientation of valves not fully located on drawings before the same are installed.
- 41.49** Suspension for piping, etc., will be supplied in running lengths, which shall be cut to suitable sizes and adjusted as required.
- 41.50** The adjustment of all hangers & supports erected in both cold & hot conditions for maintaining the proper slopes towards the drain pots and application of cold pull in the piping wherever required is also included in the scope of the contractor.
- 41.51** No temporary supports should be welded on the pressure parts and piping. In case of absolute necessity prior approval should be taken from BHEL Engineer. In such cases the contractor, if required, shall carry out heat treatment.
- 41.52** Spring suspensions / constant load hangers have to be pre-assembled for required load and erection carried out as per instructions of BHEL. Any adjustments, removal of temporary arrests / locks etc., have to be carried out as and when required.
- 41.53** Contractor shall install piping in such a way that no excessive or destructive expansion forces exists in either the cold condition or under conditions of maximum temperature and pressure. All bends, expansion joints and any other special fittings necessary to take care of proper expansion shall be incorporated as per the advice of Engineer. During installation of expansion joints, anchors, care must be taken to see that full design movement is available at all times from maximum and minimum temperature.
- 41.54** The hanger assemblies shall not be used for attachment of rigging to hoist the pipes into position. Other means shall be used to securely hold the pipe in position till pipe supports are completely assembled and attached to the pipe and building structure.
- 41.55** Layout of small-bore piping in boiler, oil systems etc. as required shall be done as per site requirement. Necessary sketch for routing these lines should be got approved from BHEL by the contractor. There is a possibility of slight change in routing the above pipelines even after completion of erection or from aesthetic point of view. Contractor at no extra cost should carry this out. As built drawing is to be submitted by the contractor after erection completion.
- 41.56** All the valves, including motorized valves, flap valves, dampers, actuators, etc. shall be serviced and lubricated to the satisfaction of Engineer before erecting the same and during pre-commissioning also. Welding or jointing of extension spindle for valves to suit the site conditions and operational facility shall be part of erection work within the quoted rates.
- 41.57** Erection and welding of necessary instrumentation tapping points, thermocouple pads,

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

- a Product groups, under which these items are released, are not covered in the scope of this tender.
- b Items are supplied by any agency other than BHEL.

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

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

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

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

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

41.63 Boiler Drum Erection is to be carried out by the contractor as mentioned in clause no. 54.1 of this tender . The contractor has to carry out all works as mentioned therein and as required to complete this work.

41.64 Scope of Work for Chemical Cleaning for the Boiler system has been covered under clause no. 54.3 of this tender.

42.0 WELDING HEAT TREATMENT, RADIOGRAPHY AND NON-DESTRUCTIVE TESTING

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

saving features.

- 42.2** Welding of pressure parts, equipment, piping, high tensile structural steel shall be done by certified high pressure welders who possess valid certificate of CIB of the State in which the equipment is erected as per provision of IBR. The H.P. welder who possesses necessary certificate shall ensure re-validation as per relevant provisions of IBR and keep the certificate valid till the completion of work. The services of such welders, the validity of whose certificates have expired shall not be utilized for high-pressure works.
- 42.3** All welders including tack welders, structural and high pressure welder shall be tested as per ASME section IX / IBR and approved by BHEL Engineer before they are actually engaged on work even though they may possess a valid IBR certificate. BHEL reserves the right to reject any welder if the welder's performance is not found to be satisfactory. The contractor shall maintain the records of qualification AND performance of welders. BHEL Engineer will issue all the welders qualified for the work, an identity card. The welder will keep the same with him at work place at all times. He may be stopped from work if he is not found in possession of the same.
- 42.4** Engineer may stop any welder from the work if his performance is unsatisfactory for any technical reason or if there is a high percentage of rejection in the joints welded by him. The welder's having passed qualification tests does not absolve the contractor of contractual obligation to continuously check the welder's performance.
- 42.5** Faulty welds caused by the poor workmanship shall be cut and re-welded at the contractor's expense. The Engineer prior to any repair being made shall approve the procedure for the repair of defective welds. After the repair has been carried out, the compliance shall be submitted to the quality engineer.
- 42.6** The contractor shall carry out the root run welding of all HP / LP piping, valves by TIG welding method only. The contractor shall have to carry out full TIG welding of butt weld joints of tubes / pipes of lesser thickness if required. During the root runs of stainless steel joints, the contractor shall before and during welding have to purge the pipes with inert gas. All welded joints for temporary piping required for chemical cleaning and steam blowing should be got done by HP welders only. The root run should be done by TIG welding. All arrangements required for the above shall be the responsibility of the contractor at no additional cost. Argon Purging is to be done for TIG Run of SS Pipes
- 42.7** All expenses for testing of contractor's welders including destructive and nondestructive tests conducted by BHEL at site or at laboratory shall have to be borne by the contractor only. While the contractor will arrange for the test pieces, limited quantity of tube and pipe material required for making test pieces will be supplied by BHEL free of cost.
- 42.8** The regulators used on welding machines shall be calibrated before putting these into use for work. The Contractor at his cost shall also arrange periodic calibration for the same.
- 42.9** **Only BHEL approved electrodes will be arranged and used by the contractor, within the finally quoted price. BHEL reserves the right to test any approved electrode being used by the contractor. Testing charges for the same shall be borne by the contractor.** All electrodes shall be baked and dried in the electric electrode-drying oven to the required temperature for the period specified by the Engineer before these are used in erection work. All welders shall have electrodes drying portable oven at the work spot. The electrodes brought to the site will have valid manufacturing test certificate. The test certificate should have a co-relation with the lot number / batch number given on electrode packets. No electrodes will be used in the absence of above requirement. The thermostat and thermometer of electrode drying oven will be also calibrated and test certificate from Govt. approved / accredited test house traceable to National / International standards will be submitted to BHEL before putting the oven in use. The contractor shall also arrange periodical

calibration for the same.

- 42.10** All butt / fillet welds shall be subject to dye penetration test as per the instructions of the engineer at no additional cost.
- 42.11** The contractor shall maintain a record in the form as prescribed by BHEL of all operations carried out on each weld. He has to maintain a record indicating the number of welds, the names of welders who welded the same, date and time of start and completion, preheat temperature, radiographic results, rejection if any, percentage of rejection etc. and submit copies of the same to the BHEL Engineer as required. Interpretation of the BHEL Engineer regarding acceptability or other wise of the welds shall be final.
- 42.12** The contractor shall carry out the edge preparation of weld joints at site in accordance with the details acceptable to BHEL Engineer. Wherever possible machining or automatic flame cutting should be done. Gas cutting will be allowed only wherever edge preparation otherwise is impractical. All slag / burrs shall be removed from the edge and all the hand cuts shall be ground smooth to the satisfaction of engineer.
- 42.13** All welds shall be painted with anticorrosive red oxide paint once radiography and stress relieving works are over. Necessary consumables and scaffolding etc including paints shall be provided by contractor at his own cost.
- 42.14** Pre-heating, radiography and other NDT tests, post heating and stress relieving after welding of tubes, pipes, including attachment welding wherever necessary, are part of erection work and shall be carried out by the contractor in accordance with the instructions of the Engineer. Contractor at his cost shall arrange all equipment and consumables essential for carrying out the above process.
- 42.15** Contractor shall arrange all necessary stress relieving equipment with automatic recording devices. The contractor shall arrange for labour, heating elements, thermocouples, thermo-chalks, temperature recorders, thermocouple attachment units, graphs, sheets insulating materials like asbestos cloth, ceramic beads, asbestos ropes etc. required for heat treatment/ stress relieving operations. The contractor should take a note of the following,
- Temperature shall be measured by thermocouple and recorded on a continuous printing type recorder. All the recorded graphs for heat treatment works shall be the property of BHEL.
 - All stress relieving equipment will be used after due calibration and submission of test certificate to BHEL. Periodic calibration from Govt. Approved / accredited Test Houses traceable to National / International standards will also be arranged by the contractor for such equipment at his cost.
 - The contractor shall obtain the signature of Engineer or his representative on the strip chart of the recorder prior to the starting of SR operations.
- 42.16** The contractor shall also be equipped for carrying out other NDT like LPI / MPI / Hardness test / Ultrasonic testing etc. as required as per welding schedules / drawings within the finally accepted price / rates.
- 42.17** The technical particulars, specification and other general details for radiography work shall be in accordance with ASME, IBR or ISO as specified by BHEL.
- 42.18** The contractor for radiography work shall use iridium-192. The geometric un-sharpness shall not exceed 1.5 mm. The contractor should take adequate safety precautions while carrying out radiography. Contractor at his cost shall arrange necessary safe guards required for radiography (including personnel from BARC).
- 42.19** Low speed high contrasts, fine grain films (D-7 or equivalent) in 10 cm width only be used for weld joint radiography. Film density shall be between 1.5 to 2.0.

- 42.20** All radiographs shall be free from mechanical, chemical or process marks, to the extent they should not confuse the radiographic image and defect finding. Pentrameter as per ASME or ISO must be used for each exposure.
- 42.21** Lead numbers and letters are to be used (generally 6mm size) for identification of radiographs. Contract number, joint identification, source used, welder's identification and SFD are to be noted down on paper cover of radiograph.
- 42.22** Lead intensifying screens for front and back of the film should be used as per the above-referred ASME specification.
- 42.23** The joint is to be marked with permanent mark A, B, C to identify the segments. For this a low stress stamp shall be used to stamp the pipe on the down streamside of the weld.
- 42.24** For multiple exposures on pipes, an overlap of about 25-mm of film should be provided.
- 42.25** Radiography personnel with sufficient experience and certified by M/s BARC for conducting radiographic tests in accordance with safety rules laid down by Division of Radiological protection only have to be deployed. These personnel should also be registered with DRP / BARC for film badge service.
- 42.26** All arrangements for carrying out radiography work including dark room and air conditioner and other accessories shall be provided by contractor within the space allotted for office at his cost. As an alternative the contractor may deploy an agency having all above facilities and who are duly approved / accredited by BARC and / or other Regulatory authorities. Detailed particulars of such agencies will be submitted and got approved by BHEL Engineer before the actual deployment of agency for radiography work.
- 42.27** The contractor shall have a dark room fully equipped with radiography equipment, film (un-exposed), chemicals and any other dark room accessories.
- 42.28** **Contractor shall note that 100% radiography will be done at the initial stages on all the piping welding joints.** Subsequently radiographic inspection will be done on the basis of quality of welding. However minimum percentage of joints to be radiographed shall not be less than the requirement of BHEL welding schedule / IBR / Customer's requirements. The percentage may be increased depending upon the quality of joints and at the discretion of BHEL. Radiography on LP piping joints is not envisaged. However other NDT test as called for in the FQP including LPI, MPI and HT will have to be carried out.
- 42.29** All the Radiographs shall be properly preserved and shall become the property of BHEL. They are to be reconciled with the work done, joints radiographed and submitted to BHEL / customer.
- 42.30** Since radioisotopes are being used, all precautions and safety rules as prescribed by BHEL/BARC/ Customer shall be strictly followed. BARC / DRP certificate to be provided before taking up the work.
- 42.31** Radiography of joints shall be so planned after welding, that the same is done either on the same day or next day of the welding to assess the performance of HP welders. If the performance of welder is unsatisfactory, he is to be replaced immediately.
- 42.32** Wherever radiographs are not accepted, on account of bad shot, joints shall be re-radiographed and re- submitted for evaluation.
- 42.33** However, if the defect persists after first repair, further repair work followed with radiography shall be repeated till the joint is made acceptable. In case the joint is not repairable, the same shall be cut, re-welded and re-radiographed at contractor's cost.
- 42.34** If the contractor does not carry out radiography work due to non-availability of source / film / chemical / operator etc., BHEL will get the work done departmentally or through some other agency at the risk and cost of the contractor.

- 42.35** Heat treatment and radiography may be required to be carried out at any time (day and night) to ensure the continuity of the progress. The contractor shall make all necessary arrangements including labour, supervisors/ Engineer required for the work as per directions of BHEL.
- 42.36** The contractor shall assist BHEL Engineer in preparing complete field welding schedule for all the field welding activities to be carried out in respect of piping and equipment erected by him involving high pressure welding at least 30 days prior to the scheduled start of erection work at site. The contractor shall strictly adhere to such schedules.
- 42.37** For P91 materials, clauses no. 54.2 of this tender will be applicable besides above mentioned clauses from 42.1 to 42.36.
- 42.38** For T91 materials, clauses no. 54.3 of this tender will be applicable besides above mentioned clauses from 42.1 to 42.36.
- 43.0** **APPLICATION of INSULATION and REFRACTORY**
- 43.1** All attachment welding, including welding of hooks / supports as per pitch both on equipment and piping shall be done as directed by Engineer. Attachment welding shall have to be done by certified welders. If necessary contractor may have to cut the hooks to correct length without any extra cost to BHEL.
- 43.2** Contractor has to supply and apply heat resistant primer on welded portions before application of insulation.
- 43.3** The mineral wool mattresses (bonded / un-bonded) / LRB mattresses are received at site in standard sizes. These are to be dressed / cut to suit site requirements by the contractor.
- 43.4** The number of layers / thickness of mineral wool / LRB mattresses for auxiliaries, pipe lines, valves and other vessels shall be as per various drawings and as directed by Engineer. For applying the mineral wool mattress, the required holding materials, if necessary by fabrication of rings/ hooks shall be fixed as directed and as per drawings and spec.
- 43.5** The contractor should ensure, proper finishing of surface of the insulation, sheeting and cementing
- 43.6** The contractor should ensure that the finished surface of the insulation works conforms to the dimensions and tolerances given in the drawings. Aesthetic finish and accuracy of work are most important.
- 43.7** It is the responsibility of the contractor to ensure that the insulation materials and sheet metal covering issued to him for application are well protected against loss or damage from weather conditions. Closed / semi closed sheds or any other arrangements required for this will be made by him at his cost. If any damage occur to the material due to improper storage or due to any causes attributable to the contractor except for normal breakage or damages allowed in such cases, the cost of such damaged material shall be to the account of the contractor. Application of Calcium Silicate is also included in the scope of this tender, at no extra cost to BHEL.
- 43.8** Aluminum sheet cladding will be fabricated to the sizes and shapes specified in drawings. Beading, swaging, beveling of sheets, crowning the sheets if necessary will be carried out by him. Two coats of anti-corrosive black bituminous paint are to be applied on inner surfaces of the cladding. Bitumen sealing compound on the joints if necessary is included in the scope of this work. **Contractor may note that they will also supply anti-corrosive black bituminous paint and bituminous sealing compound required for above works at his cost. However , if any material is received from the unit , the same shall be issued free of cost to the contractor**
- 43.9** Aluminum sheet metal cladding over insulation will consists of plain / ribbed / corrugated

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

- 43.10** A logbook shall be maintained by the contractor to obtain clearance for application of insulation. If the contractor does the work on his own accord without prior permission the area may have to be redone at his cost.
- 43.11** Contractor is liable for the exact accounting of the material issued to him and he shall make any unaccountable losses good. Wastage allowance for the material issued are as below:
1. Wool / LRB mattresses and cladding sheets..... 2%
 2. Insulation bricks and mortar2%
 3. Castable refractory 1%
- 43.12** The entire surplus, unused materials etc., supplied by BHEL shall be returned to BHEL after the work is over. Materials like gunny bags and packing materials, empty containers may be returned at periodical intervals.
- 43.13** The contractor shall leave certain gaps and opening while doing the work as per instructions of BHEL engineer to facilitate inspection during commissioning and to fix gauges, fittings and instruments. The gaps will have to be finished as per drawings at a later date by the contractor at his cost.
- 43.14** If during erection and commissioning any of the parts are to be temporarily fixed and then replaced by permanent ones at a later date or if any of the parts are to be removed for modification, rectification, adjustment and then refitted or if some parts are to be opened for inspection and checking and for measurement of metal surface temperature the same may necessitate removal and re-application of insulation and sheet metal cladding, which shall be done by the contractor and the erection rate quoted shall be inclusive of such contingencies.
- 43.15** Removable type of insulation shall be provided for valves, fittings, expansion joints etc as per the drawings or as directed by BHEL Engineer.
- 43.16** All temporary pipelines required during testing, pre-commissioning and commissioning should be insulated as directed by BHEL at no extra cost to BHEL. However required insulation material shall be issued by BHEL free of cost.
- 43.17** Insulation of expansion joints, dampers, etc shall be carried out after NDT / gas tightness test is completed.
- 43.18** Special type of Insulation wool used in pent house shall not be cut indiscriminately.
- 43.19** Contractor shall mix and apply the refractory / insulation as per the instructions of BHEL Engineer. Castable refractory / insulation after application shall be cured as per the instructions of BHEL Engineer. The contractor shall provide the required quantity of wire nails, planks for formwork and other materials for centering and grouting work.
- 43.20** Application of castable and pourable refractory between tubes, around burners, on ceiling and as directed by Engineer and as per detailed drawings and specifications.
- 43.21** Dressing of insulation brick to suit site conditions, curing refractory concrete applied/sheet cladding over insulation forms a part of this work.
- 43.22** Contractor shall observe all precautions for laying / curing of castable refractory. Any defective works found shall be re-laid by contractor at his cost.
- 43.23** Making structural supporting work for pourable insulation, laying pourable insulation, adhering to all specifications and instructions during application forms a part of this work.
- 43.24** Day to day cleaning of insulation debris and scraps to be ensured by the contractor.

Excessive wastage will attract cost recovery.

- 44.0 TESTING, PRE-COMMISSIONING, COMMISSIONING AND POST-COMMISSIONING.**
- 44.1** The contractor shall carry out all the required tests and pre-commissioning and commissioning activities required for their successful and reliable operation. These would include hydraulic test of boiler, land flow test, clean air flow test, chemical cleaning of piping and boiler, Kerosene testing of duct welds, water washing, oil flushing of oil system etc. as instructed by BHEL using contractors own consumables, labour and scaffoldings etc. Air leak test on pressure parts preliminary to hydraulic test by compressed air shall also be carried out to check and rectify the various leakage and defects etc.
- All the chemicals required for carrying out these activities will be supplied by BHEL free of cost.
- All required tests (Mechanical and electrical) indicated by BHEL and their clients for successful commissioning are included in the scope of these specifications. These tests / activities may not have been listed in these specifications.
- Specialized test equipment, if any, shall be provided by BHEL / its client free of hire charges. However contractor has to take proper care of the equipment issued to him.
- 44.2** Commissioning of ESP shall involve required tests such as air leak test, gas distribution test, motor no load test, rapping mechanism trial runs, interlock tests, charging of transformer fields, commissioning of all electrical equipment / panels, heaters and their proper tuning etc. The contractor shall provide all consumables, labour, scaffoldings and items required for satisfactory testing.
- 44.3** After completion of erection of furnace, ducts and air heaters, a test shall be performed on the steam generator by the contractor to establish the tightness of the erected equipment from the outlet of FD fan through the steam generator up to stack.
- 44.4** All the tests may have to be repeated till all the equipment satisfy the requirement / obligation of BHEL at various stages. The contractor shall do all the repairs for site-welded joints arising out of the failure during testing.
- 44.5** The scope of pre-commissioning activities cover installation of all necessary equipment including temporary piping, supports, valves, blanking, pumps, tanks, with access platforms valves, along with accessories required for hydro test, chemical cleaning, steam blowing or for any other tests. The scope also covers the off site disposal of effluents.
- 44.6** All items / material required for conducting hydraulic test, chemical cleaning, steam blowing etc., will be supplied by BHEL/ its customer and the contractor shall take delivery of **material as mentioned under clause no. 39** of this tender. However, servicing, erection, dismantling and returning of the same to stores shall be the responsibility of the respective contractor who shall be erecting the equipment / piping. The contractor may note that **no separate payment shall be released for any temporary works** that are to be carried out for conducting pre-commissioning and commissioning tests. **Bidders are advised to include expenses on temporary works along with the rates being quoted by them. Broadly the work on temporary systems will be as under:**
- Erection etc. of all temporary piping along with insulation and supports for steam blowing, interfacing for chemical cleaning and affluent disposal are to be carried out as part of Boiler work. Contractor for this work will be responsible for assisting their operation till completion of the commissioning activities. He will also service the equipment and handover the equipment to the other agency for further erection/commissioning activities.
- Erection etc. of blowers and blanks and putty required for conducting air tightness test and GD Test are to be carried out by the contractor. (Putty to be procured by the contractor).

Dismantling of the temporary equipment and piping including returning the equipment to the stores is also covered in the scope.

- 44.7** Drum will be dispatched without fixing internals and internals will be sent separately. The internals have to be fixed as and when required. Dismantling and re-assembly to be done to suit various commissioning requirements.
- 44.8** Commissioning of the boiler will involve trial run of all the equipment erected. The boiler has to be lighted up for refractory drying, alkali boil out, chemical cleaning, passivation, preservation, steam blowing and floating of safety valves. Flushing of all the lines by air, oil or steam as the case may be, trial run of the boiler, servicing of valves and any other works incidental to commissioning are to be carried out. During this period though the BHEL's customer's staff will also be associated in the work, the contractor's responsibility will be to arrange for the complete requirement of supervision, men, consumables, T&P and IMTEs till such time the commissioned units are taken over by the BHEL's customer.
- 44.9** It shall be the responsibility of the contractor to preserve the boiler as per BHEL's requirement.
- 44.10** It shall be the responsibility of the contractor to provide various category of workers in sufficient numbers along with Supervisors during Pre-commissioning, commissioning and post commissioning of equipment and attending any problem in the equipment erected by the contractor till handing over. The contractor will provide necessary consumables, T&Ps, IMTEs etc., and any other assistance required during this period. Association of BHEL's / Client's staff during above period will not absolve contractor from above responsibilities.
- 44.11** It shall be specifically noted that the above employees of the contractor may have to work round the clock along with BHEL Engineers and hence overtime payment by the contractor to his employees may be involved. The contractors finally accepted rates should be inclusive of all these factors also.
- 44.12** In case, any rework is required because of contractor's faulty erection, which is noticed during pre-commissioning and commissioning, the same has to be rectified by the contractor at his cost. If any equipment / part is required to be inspected during pre-commissioning and commissioning, the contractor will dismantle / open up the equipment / part and reassemble / redo the work without any extra claim.
- 44.13** During commissioning, opening / closing of valves, changing of gaskets, realignment of rotating and other equipment, attending to leakage and adjustments of erected equipment may arise. The finally accepted price / rates shall also include all such work.
- 44.14** The contractor shall make all necessary arrangements including making of temporary closures on piping / equipment for carrying out the hydro-static testing on all piping, equipment covered in the specification at no extra cost.
- 44.15** The valves will have to be checked, cleaned or overhauled in full or in part before erection, after chemical cleaning, steam blowing and during commissioning as may be necessary.
- 44.16** In case any defect is noticed during tests, trial runs and commissioning such as loose components, undue noise or vibration, strain on connected equipment etc., the contractor shall immediately attend to these defects and take necessary corrective measures. If any readjustment and realignment are necessary, the contractor at his cost shall do the same as per Engineer's instructions including repair, rectification and replacement work. The parts to be replaced shall be provided by BHEL.
- 44.17** All temporary supports shall be removed in such ways that pipe supports are not subjected to any sudden load. During hydraulic testing of pipes, all piping having variable spring type supports shall be held securely in place by temporary means while constant spring type support hangers shall be pinned or blocked solid during the test.

- 44.18** The contractor shall carry out cleaning and servicing of valves and valve actuators prior to pre-commissioning tests and / or trial operations of the plant. A system for recording of such servicing operations shall be developed and maintained in a manner acceptable to BHEL Engineer to ensure that no valves and valve actuators are left un-serviced. Wherever necessary as required by BHEL Engineer, the contractor shall arrange to lap / grind valve seats.
- 44.19** Cleaning and servicing of all the filters / strainers, toppings of oils coming in the system shall be done by the contractor within the accepted price.
- 44.20** At the time of each inspection, the contractor shall take note of the decisions / changes proposed by the Engineer and incorporate the same at no additional cost. The contractor shall carry out any other test as desired by BHEL Engineer/ Manufacturer on erected equipment covered under scope of this contract during testing and commissioning to demonstrate the physical completion of any part or parts of the work performed by the contractor
- 45.0** **FINISH PAINTING**
- 45.1** All exposed metal parts of the equipment, structure, auxiliaries, piping, and other items (covered within the scope of this contract) after installations are to be painted. The surfaces are to be thoroughly cleaned of all dirt, rust, scales, grease, oils and other foreign materials by wire brushing, scrapping, any other method as per requirement of BHEL. The same will be inspected and approved by the engineer before painting.
- 45.2** Mostly the equipment / items/ components will be supplied with one coat of primer paint and one coat of finish paint. However during storage and handling, the same may get peeled off / deteriorate. All such surfaces are to be thoroughly cleaned and to be touch up painted with suitable approved primer and finish paint matching with shop paint / approved final colour. Besides above two coats of approved primer paint is to be applied on all the bare / unpainted surfaces. The gas cut stubs would require being ground and rounded.
- 45.3** After applying the primer paints, wherever required, all structure / equipment / items, shall be finish painted with paints as specified by BHEL engineer. The number of coats / paint thickness shall be as indicted in the drawing / documents. However at least two coats of finish painting is to be applied. In case proper finish is not obtained in two coats, the contractor shall apply additional coat (s) till proper finish / paint thickness is achieved. Certain equipment / Items are required to be painted with approved quality heat resistant paint / primer . After completion of painting all bright spots shall be cleaned to the satisfaction of Engineer. Minimum paint thickness is to be ensured at all places as per specifications.
- 45.4** Certain equipment like control panels, valves etc. shall require spray painting. The contractor shall make arrangements of the required equipment for spray painting. Spray painting at the job site shall be permitted only at times and locations approved by Engineer.
- 45.5** **Contractor at no extra cost to BHEL shall supply all paints, primers, tools and other consumables including scaffolding materials required for finish painting.** Paint is to be of BHEL approved make only and painting should be as per colour scheme and quality approved / specified by Engineer. Valid Test Certificate for the paint so supplied shall be made available before use of the same on work.
- 45.6** The contractor may be required to fill up dents / marks by applying putty before final painting of equipment. All materials and arrangements have to be made within quoted lumpsum price/rates.
- 45.7** The contractor shall provide legends with direction of flow on equipment and piping in size specified by Engineer. Letter writing shall be done in Arabic / English or in both languages.
- 45.8** The painters have to under go test and only qualified painters will be allowed to work.

46.0 PROGRESS REPORTING

- 46.1** Contractor is required to draw mutually agreed monthly erection programs in consultation with BHEL well in advance. Contractor shall ensure achievement of agreed program and shall also timely arrange additional resources considered necessary at no extra cost to BHEL.
- 46.2** Weekly progress review meetings will be held at site during which actual progress during the week vis-a-vis scheduled program shall be discussed for actions to be taken for achieving targets. Contractor shall also present the program for subsequent week. The contractor shall constantly update / revise his work program to meet the overall requirement. All quality problems shall also be discussed during above review meetings. Necessary preventive and corrective action shall be discussed and decided upon in such review meetings and shall be implemented by the contractor in time bound manner so as to eliminate the cause of non-conformities.
- 46.3** The contractor shall submit daily, weekly and monthly progress reports, manpower reports, materials reports, consumables (gases / electrodes) report and other reports as per Performa considered necessary by the Engineer.
- 46.4** The progress report shall indicate the progress achieved against planned, with reasons indicating delays, if any. This should give the remedial actions which the contractor intends to take to make good the slippage or lost time, so that further works again proceed as per the original program and the slippage do not accumulate and effect the overall program.
- 46.5** The daily manpower reports shall clearly indicate the manpower deployed, category wise specifying also the activities in which they are engaged.

47.0 DRAWINGS AND DOCUMENTS

- 47.1** The detailed drawings, specifications available with BHEL engineers will form part of this tender specification. These documents will be made available to the contractor during execution of work at site. The contractor will also ensure availability of all drawings / documents at work place.
- 47.2** Necessary drawings to carry out the erection work will be furnished to the contractor by BHEL on loan, which shall be returned to BHEL Engineer at site after completion of work. Contractor shall ensure safe storage and quick retrieval of these documents.
- 47.3** The contractor shall maintain a record of all drawings and documents available with him in a register as per format given by BHEL Engineer. Contractor shall ensure use of pertinent drawings / data / documents and removal of obsolete ones from work place and returning to BHEL.
- 47.4** The data furnished in various annexure enclosed with this tender specification are only approximate and for guidance. However, the change in the design and in the quantity may occur as is usual in any such large scale of work.
- 47.5** Should any error or ambiguity be discovered in the specification or information the contractor shall forthwith bring the same to the notice of BHEL before commencement of work. BHEL's interpretation in such cases shall be final and binding on the contractor.
- 47.6** Deviation from design dimensions should not exceed permissible limit. The contractor shall not correct or alter any dimension / details, without specific approval of BHEL.

48.0 TAXES AND DUTIES

- 48.1** **The bidder shall quote their rates inclusive of all taxes/duties applicable for this work, except otherwise expressly set forth herein or under clause no. 48.10.2 of SCC. The Contractor shall be responsible for paying any and all Taxes/Duties assessed on the Contractor, its Sub-Contractor and Suppliers or their respective employees.**

- 48.2** **LOCAL TAXES AT SUDAN:** BHEL and / or its Customer shall obtain from the competent Sudanese Authorities all taxes exemption or pay on behalf of Contractor relating to the project including Business Profit Tax and Value Added Tax etc. However, Income Tax for personnel shall be borne by the Contractor.
- 48.3** Taxes as required to be deducted at source as per Local Sudanese Laws / Indian Law (applicable in case of only those contractors having their office in India), if any, at prevailing rates shall be deducted on gross invoice value from the running bills unless Exemption Certificate from appropriate Tax Authority is furnished.
- 48.4** **Custom duty and demurrage occurred in Port Sudan and Khartoum airport for all equipment, facilities and materials imported by the Contractor for the Project shall be paid by BHEL's Customer (M/s NEC). The contractor shall furnish list of all such items including their temporary imported equipments(temporary imported equipments to be defined and listed clearly) well in advance. However, custom duty , if any, paid by the Contractor for any reason whatsoever shall not be reimbursed.**
- 48.5** **BHEL or its Customer(NEC) shall be responsible for the custom clearance agency to clear out the Equipment, tools, materials imported (Plant Materials) and Contractor's equipment and vehicles temporarily imported for the Project as per Procedure given below at 48.6. However, the Contractor shall take all actions for chasing/follow up and bear all expenditure on his own for the same. A bank guarantee shall be issued by the Contractor, if necessary according to the custom authority for custom clearance. The bidders to assume amount of BG equivalent to custom duty pertaining to their equipments/T&Ps brought by them on repatriable basis. The Contractor shall submit all relevant dispatch/shipment documents to Project Coordinator- Sudan, BHEL, PSNR, NOIDA(UP)-India / Construction Manager, BHEL Site, Kosti TPP. The Contractor shall take delivery of materials at Port of Sudan or at Khartoum airport and responsibility of handling (unloading/loading etc) and its transportation to Kosti Power Plant shall be of Contractor at their own cost. Payment of any Que/Quay dues at Port, will be the responsibility of the Contractor.**
- 48.6** **CUSTOMS CLEARANCE PROCEDURE**
- (A) For all the supplies/ dispatches related to this Project, the consignee will be NEC, SUDAN and the name of supplier to be mentioned either as "BHEL" or "on account of BHEL". The Contractor will submit original + 7 copies of despatch documents to BHEL /BHEL's bankers after despatch of consignment from India. BHEL bankers in India will forward these documents after necessary endorsement to Bank of Sudan in Sudan. Bank of Sudan after stamping will send these original documents to NEC, Khartoum(BHEL's Customer).
- (B) The Contractor shall submit scanned / fax copies of documents such as invoice, packing list, certificate for country of origin, insurance, bill of landing etc to BHEL/ NEC, Khartoum after despatch of consignment from India.
- (C) NEC (BHEL's customer) at Khartoum will process the document and obtain certification from Sudan customs / Government for zero custom duty and payment exemption for all other applicable taxes, duties, levies etc.
- (D) NEC (BHEL's customer) at Khartoum shall forward these documents with certification to NEC-Port Sudan.

NEC (BHEL's customer) at Port Sudan after necessary clearance permit will hand over the documents to the Contractor through BHEL's representative/Transporter for taking delivery and transport to power plant site at Kosti. The Contractor will sign that he has received the consignment..

- 48.7** In case the temporary imported equipment is not defined and listed by the Contractor, the responsibility of custom clearance and payment of custom duty/taxes shall lie with them. When it is produced at any time it shall be considered as part of this Contract (i.e it will be considered as BHEL's Customer property)
- 48.8** Any demurrage incurred due to the reason of the Contractor's delay in unloading at the Port Sudan or airport shall be the Contractor's responsibility. Any other demurrage incurred during custom clearance for reasons other than those attributable to BHEL or its Customer (M/s NEC), shall also be borne by the Contractor
- 48.9** For all the items like T&Ps, Erection equipments, consumables, establishment items etc. to be exported by the Contractor to Sudan on repatriable basis, the Contractor shall furnish list and value of such items to BHEL prior to dispatch. The Contractor shall also give an undertaking to BHEL prior to dispatch declaring these items as returnable/consumable.
- 48.10 COMPLIANCE TO REGULATIONS AND BYELAWS :**
- 48.10.1** The Contractor shall conform to the provisions of any statute relating to the work and regulations and bylaws of any local authority and of any water and lighting Companies or Undertaking with whose system the work is proposed to be connected. He shall, before making any variation from the drawings or the specifications that may be necessitated for such connections give the Engineer, notice specifying the variation proposed to be made and the reasons therefore and shall not carryout any such variation until he has received instructions from the Engineer in respect thereof. The Contractor shall be bound to give all notices required by statute, regulations or bye-laws as aforesaid and to pay all fees and taxes payable to any authority in respect thereof.
- 48.10.2** The Contract shall be governed by the applicable Laws of Sudan Govt. and the bidders to ensure considering latest Sudanese Laws before quoting. If during Contract execution there may be any Change in such Law which might cause additional or reduced cost to the Contractor in the execution of the works, such additional or reduced cost, if fully justified and approved by BHEL or its Customer (M/s NEC), shall be paid to 'OR' recovered from the Contractor , as the case may be.
- 48.10.3** The Contractor shall ensure conformance in all respects with the provisions of all state and local laws, regulations or other laws in force in Sudan or elsewhere including all regulations and by-laws of any local or other duly constituted authority within Sudan or elsewhere which may be applicable to the performance of the Contract and the rules and regulations of all public bodies and companies whose property or rights are affected or may be affected in any way by the Works or any Temporary Works (which are herein referred to as "Laws"), and shall give all notices and pay all fees required to be given or paid thereby and shall keep BHEL and/or its Customer (NEC) indemnified against all penalties and liability of any kind for breach of any of the same.
- 48.10.4** The Contractor shall comply with all applicable Sudan Government's safety and sanitary laws, transportation rules, regulations and ordinances, as well as the established safety rules and practices of BHEL's Customer (NEC). The Contractor shall also provide insurance cover for his workmen throughout the contract period, under prevailing local Laws.

49.0 EXTRA WORK:

49.1 BHEL may consider for payment of extra works on man hour basis @ 2 EUROS per man hour only for such of those works which:

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

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

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

50.0 PRICE VARIATION

50.1 **The finally accepted rates for scope of work as defined in this tender shall remain FIRM throughout the contract period including extended period, if any . NO PRICE VARIATION / COMPENSATION** on account of any increase whatsoever, (irrespective of whether escalation are steep/ unanticipated or not compensated by the above escalation provisions in full towards minimum wages, consumables, coarse / fine aggregates, steel , wood, electrodes, gases or any other item / reason), will be payable during the entire period of execution including extended period, if any, unless otherwise specified elsewhere in this 'Special Conditions OF Contract' (SCC).

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 under tender clauses-11.1 to 11.11, is liable to be rejected. All these data / information should be duly supported by documentary evidences (Refer note below clause-11)

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

52.3 The Tenderers are advised to physically visit the site and fully acquaint themselves with site conditions, transportation routes, various distances and the fact that other contractors would be working in this area. BHEL shall not be responsible in any way for non-familiarization of the site conditions. Once the tenderer has quoted for the work, it is implied that he has ascertained various site conditions and NO CLAIM whatsoever will be entertained by BHEL on

any such account. **Tenderers who wish to visit Sudan to collect any information in respect of this tender, may send, preferably within 7 days of tender notice, the details of personnel along with copies of their passports in the soft form to facilitate arrangement of visas. Clarification, if any, required against this tender, should be sent to us through e-mail, preferably within 10 days of issue of this NIT, specifically stating the clause nos. of the NIT**

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

52.5 CLEARANCE OF SITE AND REPAIRS

The Contractor shall at all times keep the Site free from obstruction and shall at any time, if or if not directed by the BHEL / its Customer(M/s NEC) & their consultant, store or dispose of any constructional plant and surplus materials and clear away and remove from the Site any wreckage or rubbish or Temporary Works no longer required. Contractor has to clear the site / area where mechanical and electrical erection work is to be commenced / or in progress. The contractor shall remove construction materials and equipment lying in the vicinity and causing obstruction in the erection work within 24 hrs. notice. In case, he fails to clear the site, this will be done at his risk & cost by BHEL. On the completion of the Works, the Contractor shall, except as otherwise specifically provided, clear away and remove from the Site and around Site all construction plant, Temporary Works, surplus materials, wreckage and rubbish of every kind, and shall reinstate and leave the whole of the Site and the Works clear and in a workmanlike condition to the satisfaction of BHEL. If the Contractor fails to remove any Constructional Plant within a reasonable time after the issue of the Provisional Acceptance Certificate then BHEL or its Customer (M/S NEC) may:

- a) sell any such plant & materials which are the property of the Contractor;
 - b) return any such plant & materials which are not the property of the Contractor to the Employer thereof at the Contractor's expense;
- and, after deducting from any proceeds of sale the costs, charges and expenses in connection with such sale or return, shall pay the balance, if any, to the Contractor, but to the extent that the proceeds of any sale are insufficient to meet all such costs, charges and expenses, the excess shall be a debt due from the Contractor to BHEL and shall be reimbursed by the Contractor.

52.6 OTHERS

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

52.6.2 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. 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.

52.6.3 PACKING, MARKING AND TRANSPORTATION : All equipment and material, together with the applicable instruction book, packing list, and special site storage instructions, shall be carefully boxed, crated, or otherwise adequately protected for overseas shipment by the Contractor

52.6.4 The Contractor shall be responsible for the transport of their tools, plant and equipment and construction materials, from their place of origin to the Site and more precisely to their exact point

of utilisation at the Site. The Contractor shall take care that if the machinery is disassembled into components, the weight and size of which are in line with actual transport possibilities.

- 52.6.5** Within the limits imposed by local laws, the Contractor shall be entitled to utilise all the roads and other communication facilities existing in the country, to the same extent as any other user. BHEL and its Customer(M/s NEC) shall assist the Contractor for obtaining licenses, permits, etc. from all the local authorities.
- 52.6.6** The Contractor shall repair or replace the Works lost, damaged, or destroyed, without waiting for the settlement of claims from insurance company to ensure completion in accordance with the Overall Project Schedule.
- 52.6.7** The Contractor shall be responsible for the safety and security of all the Works and shall replace promptly at Site each part of any and all Works which may be lost or damaged or destroyed due to fire, explosion, lightning, earthquake, theft, flood, storm, tempest, aircraft and other aerial devices or articles dropped therefrom, malicious damage, etc. and the actions of the BHEL or its Customer (M/s NEC) in the operation of appliances on behalf of the Contractor in case the contractor do not act from the date of arrival of equipment, plant, materials, machinery, etc. at the Site until Provisional Acceptance Certificate has been issued.
- 52.6.8** The Contractor shall repair or replace the Works lost, damaged, or destroyed, within shortest possible time at Site to ensure commissioning and operation of the Works without delay. If the Contractor shall fail to promptly replace or repair the Works damaged as per above clause, the Employer, at his discretion, will get such works repaired or replaced as the case may be and such costs will be reimbursed by the Contractor.
- 52.6.9** **SECURITY DEPOSIT:** The contractor shall submit Security Deposit (SD) in Euros with a option to give 50% SD in form of BG in Indian Rupees (For this, BG amount in INR will be increased by 5% to cover exchange rate fluctuation) within 15 days from the date of issue of LOI as per clause no. 16.0 of the General Conditions of Contract (GCC). For Calculation purpose SD as per clause 16.2 of GCC will first be worked out in INR based on the TT selling rate prevailing on the date of technical bid opening. The SD amount in Euro shall further be worked out based on the State Bank Of India TT Buying Rate prevailing on the date of technical bid opening based on the amount of INR so worked out.
- In case the contractor opts to furnish Bank Guarantee as a part of Security Deposit, the BG shall be issued as per the Performa enclosed as per Annexure-H of the GCC and also that the BG should be issued preferably through any of the Member Banks listed in the GCC;
- For BG through any other Indian Nationalized Bank (Not covered in the list of Member Banks of GCC), the discretion of its acceptance shall lie solely with BHEL.
- 52.6.10** **LIQUIDATED DAMAGES(LD):** For delay in completion of work attributable to the contractor, the LD shall be applicable at the rate of ½% of the contract value per week of delay or part thereof limited to a ceiling of 10% of the contract value as mentioned under clause no.25.5 of the GCC of the tender.

52.6.11 **FORCE MAJEURE**

The term "Force Majeure" means any cause beyond the control of either party, which either party could not foresee and / or reasonably provide against and which prevents either party from performing his duties under the Contract. Force Majeure includes but is not limited to the following:

**War, revolution, insurrection, or hostilities (whether declared or not)
Riots, civil commotion or civil uprisings (other than among Contractor's employees)
Earthquake, flood, tempest, hurricane, lightning, or any other natural disaster.
Any fire of major proportions, or explosions.**

Strike, lockout, or other industrial disturbance other than among Contractor's employees.

If either party to this Contract because of a Force Majeure Event is rendered wholly or partly unable to perform its obligations under this Contract, other than the obligation of that party to make payments of money, that party shall to the extent provided in this Contract, be excused from the performance directly affected by the Force Majeure Event, provided that;

- a) The non-performing party, as soon as possible but in no event more than ten (10) business Days after it becomes aware of its inability to perform, shall declare that a Force Majeure Event has occurred and give the other party written notice of the particulars of the occurrence(s), including, without limitation, the nature, cause and date and time of commencement of the occurrence(s), the anticipated scope and duration of any delay, and any date(s) that may be affected thereby. If it is impracticable to specify the length of such delay at the time such notice is delivered, the non-performing party shall provide the other party with periodic (not less frequently than weekly) supplemental notices during the period the Force Majeure Event continues. Such supplemental notices shall keep such other party informed of any change, development, progress or other relevant information concerning the Force Majeure Event.
- b) The suspension of performance is of no greater scope and of no longer duration than is required by the Force Majeure Event.
- c) Obligations of either party which arose before the Force Majeure Event causing the suspension of performance are not excused as a result of the Force Majeure Event.
- d) The non-performing party immediately and continuously uses its best efforts to remedy its inability to perform with all reasonable dispatch.
- e) When the non-performing party is able to resume performance of its obligations under this Contract, that party shall promptly so notify the other party in writing. During and following the occurrence of any Force Majeure Event, Contractor and Employer each shall use its best efforts to minimize the delay and costs caused by such Force Majeure Event and shall continue actively and in good faith consider the need for and, when appropriate, execute a change order covering such event, which may result in the extension of such Guaranteed Taking-Over Date or / and additional cost.

52.6.12 INSURANCE

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

- 1 BHEL / its customer shall arrange for insuring the materials of BHEL / its customer covering the risks during transit, storage, erection and commissioning.

- 2 If due to negligence/ carelessness on the part of the contractor, any material/ equipment gets damaged, the contractor shall submit necessary documents for lodging insurance claims as required by BHEL Engineer. BHEL shall however reserve the right to recover deductible franchise and also unsettled portion of insurance claim amount from the contractor.
- 3 If due to negligence/ carelessness on the part of the contractor, any surrounding properties also get damaged, the contractor shall submit necessary documents for lodging insurance claims as required by BHEL Engineer. BHEL shall however reserves the right to recover deductible franchise and to unsettled portion of insurance claim amount from the contractor.
- 4 Insurance for all materials pertaining to the Contractor(T&Ps, Construction Materials etc.) during transit, storage and during construction shall be in his (Contractor's) scope.
- 5 **The Contractor shall provide insurance cover to all persons employed/engaged by him throughout the period of Contract, including the extended period, if any, under prevailing local laws.**

SECTION - III B

SPECIAL CONDITIONS OF CONTRACT

CLAUSE NUMBER	DESCRIPTION
53	SCOPE OF WORK
54	SPECIAL PROCESSES
55	FACILITIES TO BE PROVIDED BY BHEL / CONTRACTOR
56	TIME SCHEDULE
57	OVER RUN
58	TERMS OF PAYMENT

SECTION - III B

SPECIAL CONDITIONS OF CONTRACT

53.0 SCOPE OF WORK

53.1 BHEL has been awarded the work of setting up 4 x 125 MW Power Plant in Kosti, Sudan on EPC basis. The main equipment in power generation package consists of boiler, Electro-static precipitator, GA / FD fans, steam turbines, generators, BOILER feed pumps, piping along with the associated auxiliaries supports and controls.

The scope of work under this tender consists of taking delivery of the boiler materials from the project storage yard / stores / sheds to erection site (approximately 1 to 2 Km),

- Their preservation, safe keeping, watch and ward.
- Checking, dressing, chipping and leveling of foundations.
- Pre-assembly, erection, alignment of various equipment, machining and grouting.
- Welding, heat treatment, radiography, UT and other non-destructive tests wherever required
- Hydraulic testing, air leak test, land flow test , clean air flow test and other pre commissioning tests,
- Carrying out of Special processes as per clause 54.0 given below
- Insulation and finish painting including supply of paints etc.,
- Chemical cleaning, and passivation as per the scope given in the tender
- Steam blowing and safety valve floating including erection and dismantling of all temporary piping, valves, pumps, tanks etc. required for above operations and other commissioning activities including post commissioning operations and stabilisation of the unit,
- Unit trial operation, resolving any deficiencies observed and handing over of 4 x 125 MW Power Plant at Kosti, Sudan.

53.2 The PG wise break up of boiler and piping is tentatively as indicated under Annexure-I (A) & I(B). Approx. weight to be erected shall be 15740 MT for Boiler & 1768 MT of piping systems under as indicated in Annexure-I(A) & I(B). The contractor is required to erect actual tonnage (irrespective of any variation plus or minus) which may be necessary to complete their work and commission above boilers and complete the work in all respects as detailed in tender specifications, for which payments shall be released on finally accepted tonnage rates. The contractor undertakes to erect / commission actual quantities as per advice of BHEL Engineer and accordingly the final contract price shall be worked out on the basis of quantities actually erected at site and payments will also be regulated for the same. However, in case of over all variation in final executed value (w.r.t the awarded value indicated in the LOI) beyond (minus) 30% i.e in case of reduction in executed value w.r.t awarded value, the contractor will be eligible for compensation as per the following provision;

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

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

53.3 The NATIONAL ELECTRICITY CORPORATION (NEC), Sudan and / or their Consultant M/s. Fichtner may depute their representative for checking and supervision at different stages of work. The contractor shall be required to provide all facilities (Facilities related to inspection and testing of materials) 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 inspections 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.

53.4 Health, Safety & Environment management (HSE)

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

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

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

- No body is allowed to enter at construction site without Safety Shoe.
- Never enter work area without Safety helmet & chin strap in place.
- No climbing/working allowed without proper safety belt above 2 m. height.
- Do not exceed the speed limit 25 Kmph within premises.
- No debris obstacles allowed on the roads & passages.

- Do not walk on pipelines or false ceiling.
- Maintain good Housekeeping at work site.
- All Site supervisors & engineers (including subcontractor's) must be imparted structured training on construction safety before start of the job & record to be maintained.
- Availability of qualified & trained Site Engineer at site during all working hours.
- Site Safety training to be imparted to all workers & plan to be made to cover every worker.
- Tools box talk (5-15 minutes) by supervisor prior to commencement of any job.
- All accident / incidents(Near Miss) to be reported & investigated.(formats & procedure should be finalized)
- Daily Safety Checking by Each Site Engineer along with Safety engineer.
- Weekly co-ordination meeting of all Safety engineers with BHEL safety officer.
- Monthly safety meeting with Site In-charges.
- All Safety equipment must be ISI marked & checked by Safety officer before use.
- Bamboo/wooden Scaffolding material not allowed.
- LPG cylinders not allowed for gas cutting.
- Good House keeping. Separate waste bins to be used for flammable & non flammable material.
- Safety awareness programs for workers by display of boards, posters, competitions, talks etc.
- Deployment of Safety Supervisors for every 250 workers and part there of at work site.
- Display of List of First Aid trained persons.
- Testing certificates for lifting tools & tackle.
- Provision & maintenance of fire extinguishers at construction site & material stores.
- Display of emergency telephone numbers at various locations.
- For work in confined space use 24 V lamp fitting & use tools with air motors or electric tools with max. 24 V.
- For confined space entry Gas test must be done before & at regular intervals.
- Checking & tag of equipment like grinding machine, welding machine, gas cutting set etc. by supervisors before use.

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

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

Contractor shall ensure following:

1. Contractor has to maintain contact with local hospital having scanning & other modern medical facilities required during emergency including ambulance.
2. Contractor has to ensure pre employment medical check for all staff & workers.
3. Contractor has to ensure that adequate First Aid facilities with trained nurse are available at work site for emergency purpose. This emergency set-up should include, but not limited to, following;
 - Male nurse (in shifts)
 - Oxygen set up
 - Breathing apparatus
 - Eye wash facility
 - Stretcher
 - Trauma blanket
 - Medicines.

In addition to above, BHEL has arranged ambulance at work site for emergency purpose, which can be utilized, free of cost, by contractor in case of emergency. In case , under unavoidable circumstances , if the ambulance is not available , the contractor will have to arrange for the same as under clause 53.4.2.1 mentioned above.

53.4.3 The contractor shall comply with following towards Social Accountability;

- (a) The contractor shall not employ any employee less than 15 years of age in pursuant to ILO convention. If any child labour were found to have been engaged ,the Contractor shall be levied with expenses of bearing his education expenditure which will include stipend to substantiate appropriate education or employ any other member of family enabling to bear the child education expenditure.
- (b) The Contractor shall abide by UN convention w.r.t Human Rights and shall be liable for Discrimination/Corporal punishment for failure in meeting with relevant requirements.
- (c) The Contractor shall arrange potable drinking water to its employees & workers.

53.4.4 Contractor shall make necessary arrangements to ensure following:

- **The contractor shall ensure deployment of Qualified level-2 Engineer for NDT services at site.**
- Contractor shall ensure **deployment of Qualified & Experienced Safety Engineer / Officer** at site.
- Contractor shall ensure that all the **T & Ps deployed** by them, including cranes, **are regularly certified by approved testing agency** & the relevant certificates to this effect are to be given to BHEL

for records.

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

Additional safety requirement of BHEL's Customer(M/S NEC), if any, shall be provided by the Contractor without any extra cost. Non adherence of safety requirements will attract penalty, which shall be as follows;

- a) Penalty equivalent to EUROS 15 for the first violation.
- b) Penalty equivalent to EUROS 30 for the subsequent violations.

For serious lapses, as decided by BHEL, even fines upto EUROS 500 at a time can be imposed

54.0 SPECIAL PROCESSES

54.1 DRUM LIFTING

54.1.1 Boiler drum shall be transported and placed near the boiler structure by another agency. Shifting / dragging (Approx. 500 m) and positioning of the drum below the structure and its alignment is to be carried out by the contractor under this contract.

54.1.2 All the T & P required for boiler drum lifting has to be arranged by the contractor. The contractor at site will fabricate drum-lifting structures. For fabrication of structure, the contractor at his cost shall arrange consumable for the same. Steel for this purpose shall be supplied by BHEL and the contractor shall take delivery of **material as mentioned under clause no. 39** of this tender. The contractor, at his own cost, shall carry out fabrication, erection and complete installation of drum lifting structure. After completion of drum erection and alignment, the contractor shall dismantle the drum lifting arrangements. The contractor may note that **no separate payment shall be released for any temporary works** that are to be carried out for drum lifting. **Bidders are advised to include expenses on temporary works along with the rates being quoted by them.**

Dismantling of the temporary equipment and piping including returning the equipment to the stores is also covered in the scope

54.1.3 BOILER DRUM LIFTING will be carried out by standard method using electric winches. For this, ALL THE EQUIPMENT shall be provided and operated by contractor within the quoted rates. Under this operation, the following is also envisaged in the scope of the Contractor:

1. Fabrication and Installation of Cathead Structure as per drawing supplied.
2. Installation of winches and associated equipments in position in the Boiler as per instruction. All these equipments will be provided near the Boiler.
3. Providing the services of skilled / Unskilled workers for handling/ installation of the winches and associated equipments .
4. Lifting and positioning of U-Rod with the help of winches.
5. Coordinating the Lifting of Drum and U-Bolts.
6. Alignment of Drum and fixing of U-Bolt.
7. Dismantling, lowering and removing of Lifting Equipments near Boiler.

Overhauling of drum lifting winches, both mechanical and electrical parts including application of preservative coating on wire ropes and servicing, lubricating and greasing shall be carried out by contractor.

54.1.4 Lashing of wire ropes on the drum with suitable wire ropes has to be done before fixing the lifting arrangement. Contractor has to provide suitable size and quality of wire ropes and clamps for lashing and other purposes. Certificate for the wire ropes and clamps are to be submitted to BHEL Engineer at site for approval.

54.1.5 Drum lifting shall be allowed after completion of main structural work and all the bracing including the bracing for all the columns and horizontal boiler level platforms. Contractor shall carry out instructions of BHEL Engineer during the drum lifting operation.

54.1.6 For drum lifting, certain temporary bracings (to be supplied by BHEL) have to be erected to obtain proper rigidity of structure in place of permanent bracing. The same has to be removed and replaced with permanent bracing. **No payment shall be made for erection and dismantling of temporary bracing.**

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

54.2 Welding HT, RG and NDT for P91 Piping materials

54.2.1 For Piping Systems , P91 materials is envisaged for PGMA 80-300 and 80-304 . Special care is essential for carrying out the installation of this system and strict quality norms and welding procedure will have to be followed at site . The Contractor is advised to get familiarized with the work procedure . In addition to the general clauses for Welding , RG and NDT given under clause 42 of this tender, the following clauses will be applicable. This welding is to be carried out

strictly under the supervision of BHEL Engineer and all repairs etc will be carried out as per the laid out procedure .

54.2.2 For carrying out the installation , the following items are to be arranged by Contractor at no extra cost to BHEL (within finally accepted unit rates):

- a) Induction Heating Machine with Outgoing Cables
- b) Suitable Power BackUp (DG Set)
- c) Spot welding Machine for Fixing of Thermocouples
- d) Calibrated Thermocouples
- e) Calibrated temperature Recorder
- f) Contact Type calibrated temperature Gauge.
- g) UT Testing and Hardness testing

54.2.3 The following will also have to be provided by the Contractor:

- a) Qualified operator for Induction Machine and DG Set
- b) All cables for connecting Induction Machine and DG Set to Main Supply along with Changeover System.
- c) Welder Qualified as per ASME IX and IBR for P91 Materials . Site Welder Qualification tests will be conducted also .
- d) Exclusive Trained Welding Engineer for Supervising P91 Welding and Heat Treatment
- e) Qualified NDE Engineer (Level -II) and welding Supervisor (Level-I)
- f) Required GTAW and SMAW machines
- g) Welding Machine for Demagnetizing along with cable and Residual Field Indicator
- h) Providing Enclosure for Welding area suitable for guarding against cold draught, water and dust at all welding locations .
- i) Providing of Argon purging for the welding operation (including supply of consumables eg Water Soluble Paper / Aluminium Dam arrangement.)
- j) Providing of Heating by Gas Burner as Standby Arrangement.
- k) Providing of Baking ovens and portable ovens
- l) Providing Band Saw/ hacksaw/ Grinder for Cutting with tools.
- m) Providing machining for Edge preparation
- n) Providing of LPI and MPI Facility as specified in the Welding process, including supply of all consumables.
- o) Providing and applying insulation band as specified in the welding procedure.

The above comprise of the major requirements for the process . The Contractor has to provide all services and consumables (Except for

electrodes and fillers) for completion of the work.

54.3 Chemical Cleaning

54.3.1 Chemical Cleaning will carried by a contractor within the finally accepted unit rates. The work of installation of tanks , Pumps , Piping and operation of the system is in the scope of this tender. However, required material for this process shall be issued by BHEL free of cost.

55.0 FACILITIES TO BE PROVIDED BY BHEL/ CONTRACTOR

55.1 The Contractor shall during the progress of the work, provide, erect and maintain at his own expenses all necessary temporary workshops, stores, consumables, offices, etc. required for the proper and efficient execution of the work. The planning, setting and erection of these buildings shall have the approval of the Engineer and the Contractor shall at all times keep them tidy and clean and sanitary condition to the entire satisfaction of the Engineer. BHEL shall provide free of charge limited open space for office & storage shed, as and where made available **by BHEL's customer**. 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. 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 expenses incurred shall be recovered from the contractor along with prevailing overhead. The decision of BHEL Engineer in this regard shall be final.

55.2 Contractor shall be responsible for providing all necessary facilities like residential accommodation, transport , electricity , water , medical facilities etc. as required under various labour laws and statutory rules and regulations framed there under to the personnel employed by him. Land for construction of temporary accommodation for the contractor's personnel including labour colony shall be provided by BHEL free of cost. **This land shall be within/near plant boundary wall of the power station. The contractor shall at his own cost, provide temporary housing and / or camp accommodation for his site personnel, including sanitary facilities, canteen facilities etc. The contractor shall submit for prior approval of BHEL, plans for all such accommodation he proposes to erect before any construction commences. The contractor shall be responsible for all costs associated with any temporary housing and / or camp accommodation provided by him.**

55.3 All temporary housing and camp accommodation shall be run and maintained by the Contractor in efficient condition in accordance with the laws in force in Sudan. The sanitary facilities shall be kept in clean and orderly conditions to the approval of BHEL and public health authorities of Sudan. The Contractor shall comply with sanitary laws, regulations and ordinances of Sudan Govt.

55.4 BHEL shall provide Power supply at 240 V, 1 phase for labour colony free of charge at one point . Further distribution will be done by the Contractor. BHEL shall provide potable/drinking water supply for labour colony free of charge, at one point. Further distribution will be done by the Contractor at his own cost.

- 55.5** The Contractor shall be responsible for providing adequate transport to and from the site for his own and his personnel who may be brought in daily from their living quarters or housing areas.
- 55.6** Medical facilities available to BHEL staff shall be extended to Contractor's personnel, if possible. However, the Contractor shall bear all costs in respect of the Doctor's fees and all other expenses.
- 55.7** The Contractor shall be fully responsible for the death or injury to any person employed by him for the purposes of or in connection with the execution of the Contract. The Contractor shall also provide insurance cover to all persons employed/engaged by him throughout the period of Contract under prevailing local laws.
- 55.8** Construction power, for construction purposes will be provided free of cost and at one point near erection/construction site from supply point. Further distribution of power shall be done by contractor at his cost. All wiring must comply with local regulations and will be subject to BHEL's inspection and approval before connecting supply.
- 55.9** Provision of distribution lines of power from the central points to the required place with proper distribution boards observing the safety rules laid down by the authorities of the state shall be done by the contractor, supplying all the materials like cables, distribution board, switch boards, TPN, CBS, ELCBS/ MCCBS / Copper / Brass clamps, copper conductor, change over switches pipes etc. 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 shift / hours accordingly and deploy additional manpower if necessary so as to achieve the targets.
- 55.10** Following points should be strictly adhered to by the contractor while drawing construction power supply from Distribution Board.
- (a) All electrical installations should be as per Sudan / International 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 their own earthing arrangement for their equipment / DB earthing. Earthing connection have to be done with copper conductor and copper / brass clamps with BHEL's prior permission.
 - (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. Contractor will also submit a report on all electrical connected load by the 7th of every month.

(j) ELCB will be tested once in a week or as deemed fit by BHEL Engineer 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.

(k) 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

55.11 Adequate lighting facilities such as flood lamps, hand lamps and area lighting shall be arranged by the contractor at the site of construction, contractor's material storage area etc. within finally accepted rates.

55.12 **BHEL will make available water for construction/testing purposes close to the construction areas including potable/drinking water supply for site free of charge. Distribution within the plant area will be done by the Contractor at his own cost. BHEL will provide support and assistance to the contractor in arranging necessary connections with the local water supply authority. However, the contractor shall bear all cost on this account.** Contractor to satisfy himself that the water drawn by him is fit for construction / consumption and adequately treat such water at his cost when it is not found fit for the said purposes.

55.13 Though the contractor will be provided electricity and water free of charges at one point, the contractor shall however ensure that there is no wastage. Periodical audits will be held to ensure that these resources are being optimally used. In case any wastage is observed, BHEL reserves the right to recover any charges /penalty as deemed fit to be decided by BHEL Engineer.

56.0 TIME SCHEDULE

56.1 The Contractor shall commence the works within 30 days from the date of issue of letter of intent (unless BHEL decides to fix any other later date) and shall thereafter proceed to carry out and complete the Works continuously, diligently and without delay. Time shall be of the essence in the performance of the Contractor of its obligation under the Contract.

56.2 **Entire work as detailed in tender specifications shall be completed, in all respect, within 32 months** from the scheduled date of start of work as per the programs / milestones indicated by BHEL from time to time. However, finishing works shall be allowed to be completed upto one month after synchronization of last unit. The Contractor has to mobilise adequate resources to meet BHEL's commitments to their customer as indicated from time to time. **In case due to reasons not attributable to the contractor, the work gets delayed and additional manpower / resources have to be mobilized so as to expedite the work to meet various milestones, same shall be done within the quoted rates, at no extra cost to BHEL. In the event the contractor fails to respond to these requirements, BHEL shall take appropriate actions in line with the provisions of General Conditions of Contract.**

56.3 Unit # 1 is scheduled to be commissioned by 21st month from Zero date of this contract. Unit #2, 3 & 4 shall follow at interval of 4 months respectively. Boiler /

pipeworks of respective units are to be scheduled accordingly. The various milestone dates to be achieved as per the current status of contract, are as below

MILE STONES	MONTH
Release of LOI	Zero Date
Start of Erection	30 days from issue of LOI
Drum lifting	5 th Month
Hydro Test	13 th Month
Light up	16 th Month
Chemical Cleaning & restoration	17 th Month
Steam Blowing completion & SVF	19 th Month
Synchronisation	20 th Month
Trial operation and Handing Over	21 nd Month

Milestones for Unit #2, 3 & 4 shall follow at interval of four months respectively. Based on above time schedule, the contractor shall submit, within one month from Zero date, detailed programme for construction activities envisaged under this contract. However, the submission for approval by BHEL of such program shall not relieve the contractor of any of his duties or responsibilities under this contract.

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

57.0 OVER RUN

57.1 In case due to reasons not attributable to the contractor, the work gets delayed and the scheduled completion gets extended, the contractor shall not be entitled for any over run compensation for a period of first 3 (THREE) months after the contractual completion date. In case the scheduled completion time gets extended beyond 3 (THREE) months as stated above, the contractor shall be considered for payment of fixed over run charges,

@ 7500 EUROS per month

on receipt of advance notice intending to claim over run and on fulfillment of following conditions:-

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

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 (both skilled and unskilled) and other resources required for completion of the job expeditiously for the entire contractual period including total extended period.

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

58.4 **MODE OF PAYMENT:**

- (a) Payments shall be made by cheque or bank transfer.
- (b) BHEL Engineer shall certify regarding the actual work executed in the measurement books in line with approved billing schedule. The contractor shall submit progressive bills for the works completed in line with approved billing schedule, once in a month. The Contractor shall be paid monthly running bill to a maximum of 95% of the value of the work actually executed on site provided the work has been executed to the satisfaction of the Engineer.
- (c) Any certificate relating to the work done may be modified by any subsequent interim certificates or by the final certificates and no certificate of the Engineer supporting an advance payment shall by itself be conclusive evidence that any work or materials to which it relates are in accordance with the contract.

(d) Currency of Payment and Exchange Rate

(i) Payment IN EUROS

85% of the Total Contract Price will be paid in EUROS subject to RBI guidelines.

Bidder has to ensure that total imports (CIF Value) from 3rd country i.e. steel (wherever required), cement and other materials which is going directly from the 3rd Country to Kosti Site in Sudan shall not be more than 50% of the Total Contract Price to ensure that total Imports from the 3rd country going directly to Sudan Site shall meet the RBI guidelines.

(ii) Local Currency Payment

Balance 15% of the Total Contract Price will be paid in local currency (i.e. Sudanese Dinar) for the supplies and services carried out in Sudan.

Exchange rate from one currency to another applicable for the entire period of contract including extended period, if any, shall be the rate prevailing on the date of opening of technical bid (Part-I). For conversion from EUROS to Sudanese Dinar, buying rate of EUROS as available on the website of Bank Of Sudan (www.bankofsudan.org) on the date of opening of technical bids (Part-I), shall be considered and will be applicable for the entire period of Contract including extended period, if any. If the date happens to be a holiday, the exchange rate of next working day will be considered

58.5 Advance Payment

- (a) 5% of the contract value shall be paid as interest bearing advance against submission of a Bank Guarantee for an amount equal to 1.25 times of advance valid for 24 months initially and thereafter extension for a period upto which the advance is fully adjusted. The interest chargeable shall be Prime Lending Rate of State Bank of India plus 2%.
- (b) The advance paid shall be recovered from the contractor's monthly running bills to an extent of 10% of each bill amount till it is fully recovered. The BG amount shall be allowed to be reduced every six months by an amount equal to the amount adjusted against running bills.

The BG against advance shall be returned after full adjustment of the entire amount of advance along with interest.

58.6 PROGRESSIVE PAYMENT on pro-rata basis

I-AA 1 % of awarded value on start of pre assembly work by deploying one number of 75 T crane, one number 18/20 T crane and at least one number 8/10 T Hydra in working condition **at site**.

I-AB 0.5 % of awarded value on start of erection work of **Main Boiler column for** after checking their trueness and on certification by BHEL Engineer.

**I.B PROGRESSIVE PAYMENT on pro-rata basis
(80% of unit rates)**

(Applicable for all items except Insulation work)

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

OR

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

2 50% of the 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.

**I.C PROGRESSIVE PAYMENT on pro-rata basis
(80% of unit rates)**

(For INSULATION AND REFRACTORY work)

1 65% of the contract unit rate on fabrication/fixing of retainers, lagging & stitching of mattresses and welding of retainers, fixing of casing supports, fabrication, beading, sealing, bitumen painting, installation and screw fixing of cladding & completion of all jobs as per specifications. The above work includes transportation of required material on location and its proper protection

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

NOTE: BHEL site incharge, at his discretion can split / re-group above payment schedule, to facilitate site operations.

II.B MILESTONE PAYMENTS (11% of awarded CV)

- 1** 4 x 0.25 % of CV on successful completion of drum lifting of the boiler.
- 2** 4 x 0.5 % of CV on successful completion of hydro test of the boiler.
- 3** 4 x 4 x 0.125 % of CV on successful completion of trial run of FD & GR fans
- 4** 4 X 2 x 0.125 % of CV on successful completion of mechanical work of each pass of ESP.
- 5** 4 x 0.25 % of CV on successful completion of boiler light up.
- 6** 4 x 0.25 % of CV on successful completion of chemical cleaning and passivation of boiler.
- 7** 4 x 0.5 % of CV value on successful completion of steam blowing and SVF.
- 8** 4 x 0.25 % of CV on successful achieving full load and completion of trial operations.

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

III Providing and applying PAINTING-Payment on Prorata basis

4 x 0.75 % of awarded CV for boiler work including piping system.

IV 4 x 0.5 % of contract value will be payable on handing over of the boiler to BHEL's Customer or 3 months after contractor has discharged his responsibilities as stipulated in this contract, whichever is earlier, if delay in handing over is not attributable to contractor. The boiler shall be considered as handed over on completion of trial operation.

V The balance 2.5% CV shall be payable on completion of all pending work, rework wherever required, area cleaning, reconciliation of materials, fulfillment of contractual obligations, and on submission and passing of Final Bill.

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

Annexure – 1 (A)
WEIGHT SCHEDULE
(BOILER & AUXILIARIES)

AA: SUMMARY OF WEIGHTS

Approximate weight to be erected for each boiler: 3935 MT
 Total weight to be erected for 4 no. boilers : 15740 MT

BB: Product Group (PG) Wise Weight Schedule For BOILER

Sl.No.	PG	DESCRIPTION	TOTAL (MT)
1	4	Boiler drum	91
2	5	Water wall headers and lower drums	39
3	6	Water wall panels	157
4	7	Circulation system components	93
5	8	Backstays & framing	59
6	9	Seal Boxes	4
7	10	Super heater headers	33
8	11	Super heater coils and walls	212
9	12	Super heater components	45
10	15	Reheater Header	14
11	16	Reheater and coils and walls	50
12	17	Reheater components	5
13	18	Roof skin casing	6
14	19	Economiser headers, coils & supports	48
15	20	Soot blowers	7
16	21	Soot blowers & soot blowing system	10
17	24	Boiler integral trim piping	91
18	28	Manholes & furnace openings	5
19	30	Fixing components for main boiler lining & Insul.	37
20	31	Boiler skin casing	16
21	32	Fixing components for boiler aux. insulation	50
22	33	Lining and insulation material	198
23	35	Boiler supporting structure	588
24	36	Boiler galleries & stairways	472

25	37	Boiler outer casing	14
Sl.No.	PG	DESCRIPTION	TOTAL (MT)
26	38	Inter connecting walk ways	78
27	39	External structure	173
28	41	Oil system components	3
29	42	Oil piping, pump & filter (excluding C&I items)	52
30	43	Scanner fan and ppg	12
31	45	Wind box	24
32	48	Ducts Dampers & expansion joints	442
33	50	SCAPH	7
34	52	Air preheater	163
35	56	Radial fans	98
36	57	Gates	20
37	71	Electrostatic precipitator	475
38	81	Tanks and vessels	20
39	89	Galleries & stairs for ESP	16
40	99	Lifting tackles & other handling equipment	8
	TOTAL		3935

NOTE: Above details are only to give a general idea to the contractor to quote the rates as per rate schedule. Besides PGs indicated above, there is likelihood of addition of new PGs for release of some items integral to Boiler. Contractor is required to carryout such PGs also within their applicable tonnage rate. The decision of BHEL regarding inclusion of new / additional PG will be final & binding on the contractor. Certain items like insulation material, cladding, valves etc. may / may not be supplied by other suppliers / BHEL units like PEM etc. as per PGMA applicable for Boiler system. Such items are also to be erected as per tonnage rates & as directed by BHEL. No extra claim shall be entertained on this account.

Annexure – 1 (B)
WEIGHT SCHEDULE
(PIPING SYSTEMS)

AA: SUMMARY OF WEIGHTS

Approximate weight to be erected for each boiler: 442 MT
Total weight to be erected for 4 no. boilers : 1768 MT

BB: Product Group (PG) Wise Weight Schedule For each Boiler

SL NO	PGMA	DESCRIPTION	WT/BOILER(kgs)	REMARKS
1	24345	MS FROM SH OUT TO BOILER STOP VALVE	4,100	P91
2	80301	MS FROM BOILER STOP VALVE TO ESV	28,300	P91
3	80303	MS HEADER TO AUX PRDS	4,400	
4	80304	MS HEADER TO HPBP VALVE	4,300	P91
5	80307	HP & LP BYPASS WARM UP	600	
6	80310	HRH FROM REHEATER TO INTERCEPTOR VALVE	45,600	
7	80320	CRH FROM TURBINE TO REHEATER	22,600	
8	80321	HPBP VALVE TO CRH PIPING	6,600	
9	80340	AUX STEAM HEADER	1,100	
10	80341	AUX STEAM HEADER INTERCONN BETWEEN UNITS	3,800	
11	80342	AUX STEAM TO SCAPH	2,900	
12	80343	AUX STEAM TO AH SOOT BLOWERS	360	
13	80344	AUX STEAM TO FO SYSTEM TP	7,000	
14	80345	AUX STEAM TO DEAERATING HEATER	3,600	
15	80351	AUX STEAM TO UNLISTED USERS - SG SCOPE	1,700	
16	80355	STEAM TRACING PIPING	3,700	
17	80364	CBD TANK VENT TO SYSTEM	350	
18	80365	CBD TANK VENT/SV EXHAUST TO ATMOSPHERE	750	
19	80366	IBD TANK VENT TO ATMOSPHERE	3,800	
20	80373	AUX STEAM HEADER SV EXHAUST	1,200	
21	80395	AUX STEAM TO FUEL OIL ATOMISING	1,400	
22	80418	ERECTION MATERIALS FOR INSTRUMENTS	300	
23	80420	BOILER FEED PUMP SUCTION	3,700	
24	80421	BOILER FEED PUMP RECIRCULATION	3,800	

25	80423	BOILER FEED PUMP TO HPH INCLUDING BYPASS	18,500	
26	80424	BFD BETWEEN HTRS & GROUP PROTECTION VLV	6,800	
27	80425	BFD FROM FINAL HPH TO SG TP	25,300	
28	80430	SPRAY WATER TO HPBP	250	
29	80431	SPRAY WATER TO AUX PRDS	2,500	
30	80432	SPRAY WATER TO BOILER DESH UPTO SG TP	550	
31	80450	CBD AND EMERGENCY DRUM DRAIN	2,300	
32	80451	BOILER INTEGRAL PIPING DRAINS	2,800	
33	80452	HP PIPING DRAINS - SG SCOPE	1,700	
34	80453	LP PIPING DRAINS - SG SCOPE	4,300	
35	80454	SCAPH DRAINS	2,500	
36	80460	SG AUX COOLING WATER UNIT SYSTEM	20,900	
37	80471	BOILER WATER WASH TO & FROM UNIT	3,200	
38	80480	FIRE WATER-OTHER AREAS	4,200	
39	80600	HIGH PRESSURE DOSING PIPING	500	
40	80601	LOW PRESSURE DOSING PIPING	50	
41	80612	SERVICE AIR FOR INDIVIDUAL UNITS	1,500	
42	80616	INSTRUMENT AIR FOR INDIVIDUAL UNIT	8,300	
43	80650	FUEL OIL SUPPLY AND RETURN PIPING	23,000	
44	80901	SUB DELIVERY VALVES FOR LIGHT UP	1,200	
45	80905	BHEL VALVES FOR LIGHT UP	9,600	
46	80906	BHEL VALVES FOR STEAM BLOWING	4,700	
47	80921	H&S FOR LIGHT UP STEAM LINE	2,000	
48	80922	H&S FOR LIGHT UP - NON STEAM LINES	20,000	
49	80923	H&S FOR STEAM BLOWING	32,000	
50	81003	CONTINUOUS BLOW DOWN EXPANDER-D1500 MM	2,300	
51	81008	INTERMITTENT BLOW DOWN EXPANDER-D2000 MM	4,300	
52	81018	MIXING TANK FOR CHEMICAL DOSING	1,800	
53	81120	HIGH PRESSURE DOSING PUMP	310	
54	81318	FIX COM FOR MISCELLANEOUS PPG INSULATION	960	
55	81327	MINERAL WOOL BONDED	6,100	
56	81341	SEALING COMPOUND FOR INSL	90	
57	81350	ALUMINIUM CLADDING FOR INSULATION	4,000	

58	81411	DIRECT GAUGES FOR STEAM LINES	50	
59	81412	DIRECT GAUGES FOR NON-STEAM LINES	1,100	
60		MINERAL WOOL BONDED + CLADDING FOR INSULATION	70,000	
TOTAL PIPING			441,520	SAY 442 MT

NOTES:

- a) All the above systems of piping include the erection of pipes, bends, valves, fittings, impulse piping and including root valves, sampling lines, drains, hangers and supports & other accessories so as to make the systems complete in all respect.
- b) Above system of piping can be regrouped / renamed or any addition / deletion in the system can be made in order to make system complete as per requirement. No extra cost shall be entertained on this account.
- c) The piping systems mentioned above are only indicative and does not cover all the piping systems to be erected / commissioned. Contractors are however required to erect commission all piping systems shown in drawings & other documents which may be necessary for erection, completion & overall commissioning of Cogeneration plant at the accepted unit rates.
- d) The tonnages indicated are tentative only and may vary during execution of work. The contractor is required to erect / commission all piping systems shown in drawings and documents which may be necessary for overall commissioning of BOILER. Payment shall be released on the basis of actual work executed as per final accepted rates.
- e) Bidders may note above while quoting / accepting tonnage rates for subject work.

ANNEXURE-II**INDICATIVE LIST OF MAJOR T&Ps TO BE PROVIDED BY CONTRACTOR FOR EXECUTION OF TENDERED WORKS FOR MOST DURATION OF THE CONTRACT**

SL NO	EQUIPMENT	QUANTITY
1	CRAWLER CRANE 150 T	1 NO
2	CRAWLER CRANE 75 T	1 NO
3	MOBILE / CRAWLER CRANE 18 / 20 T	2 NOS.
4	HYDRA CRANE 8 / 10 T	2 NOS
5	TRAILER WITH PULLING UNIT (20/25 T)	1 NO
6	TRAILER WITH PULLING UNIT (10/15 T)	1 NO
7	LOW BED TRAILER (50 MT)	@@@
8	AIR COMPRESSOR 250 CFM	@@@
9	ELECTRIC WINCH 2/3/5 T	@@@
10	WELDING SETS WITH ACCESSORIES	@@@
11	POWER DRILL MACHINE FOR PLATFORM GRILL & ROOF	3 NO
12	MOTORISED HYDRAULIC TEST PUMP	1 NO
13	DRUM LIFTING ARRANGMENT (10 t electric winches / ropes / pulleys)	1 SET
14	EQUIPMENT FOR P91 MATERIAL INSTALLATION / WEDING ETC	2 NO
15	HUCK BOLTING MACHINE	4 NO
16	HYDRAULIC PIPE BENDING MACHINE FOR BENDING PIPES OF SCH 180UPTO 80 nb	2 NO

NOTE:

1. The above list specifies only major T&P (may not be complete) to be deployed by the contractor and is based on minimum requirement. All additional / other tools and plants including suitable capacity D shackles, slings, rails sleepers hydraulic / mechanical jacks etc which are required for satisfactory & timely completion of work shall also be deployed by the contractor within finally accepted rate / price.
2. Other terms and conditions regarding above items shall be as per clause no. 37 (Tools & Plants/IMTE) .
3. @@@ AS PER REQUIREMENT

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

SL NO	EQUIPMENT	QUANTITY
1	HAND OPERATED MEGGER 500 / 1000 V	As per requirement
2	TONG TESTER 10,20 OR 50 Amp + / - 3 % ACCURACY	As per requirement
3	DIGITAL MULTIMETER	As per requirement
4	ANALOGUE MULTIMETER	As per requirement
5	6 / 12 POINT TEMPERATURE RECORDER (0 TO 1000 DEGREE C) FOR STRESS RELIEVING INCLUDING THERMOCOUPLES, CABLES ETC	AS PER REQUIREMENT
6	U TUBE MANOMETER 0-2000 MM WATER COLOUM	As per requirement
7	INCLINED MANOMETER 0-50 MM WATER COLOUM	As per requirement
8	BOLT TENSION CALIBRATOR	As per requirement
9	ANEOMETER 0-15 M / SEC	1 NO
10	PITOT TUBE	1 NO
11	MV / MA SOURCE (0-200 MV, MA)	1 NO
12	5 KV MOTORISED MEGGER	1 NO

NOTE:

1. The above list specifies only major IMTEs (may not be complete) to be deployed by the contractor and is based on minimum requirement. All additional / other IMTEs which are required for satisfactory & timely completion of work shall also be deployed by the contractor within finally accepted rate / price.
2. Other terms and conditions regarding above items shall be as per clause no 37 (Tools & Plants/IMTE)

ANNEXURE-IV

**CERTIFICATE OF DECLARATION FOR CONFIRMING
THE KNOWLEDGE OF SITE CONDITIONS**

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

Tenderers Name and Address

Place:

(Signature of the Tenderer with stamp)

Date:

ANNEXURE-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.....

ANNEXURE-VII

RATE SCHEDULE

Sl. No	DESCRIPTION OF WORK	Unit Rate in EUROS (In figures and words)	TOTAL VALUE in EUROS (In figures and words)
1	Rate in EUROS per MT for handling, erection, testing, commissioning, trial operation and handing over of 4 x 125 MW BOILERS (for BOILER WORKS) including auxiliaries etc as per tender specifications (Approx. tonnage involved is 15,740 MT as per Annexure- I A)	/	
2	Rate in EUROS per MT for handling, erection, testing, commissioning, trial operation and handing over of Piping systems for 4 x 125 MW BOILERS as per tender specifications		
a	All Piping systems Except P91 (Approx. tonnage involved is 1620 MT as per Annexure- I B)		
b	P91 Piping (Approx. tonnage involved is 148 MT as per Annexure- I B)		
	TOTAL VALUE		

NOTES:

1. Only 'Unit Rate' shall be considered for evaluation and award. Evaluation of the bids shall be done based on total value.
2. The rate shall be entered in figures as well as in words. In case of difference in rates between words and figures, the lesser of the two will be treated as valid rate.
3. In case of omission in quoting any rate, the evaluation will be done considering the highest quoted rate obtained against that item. But the work, if awarded, will be on the lowest quoted rate obtained against that item.

(Seal and Signature of Tenderer)

SECTION- I

GENERAL INSTRUCTIONS TO TENDERERS

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

11.2 **INCOME TAX CERTIFICATES** : A Certificate of Income tax clearance from the appropriate authority in the forms prescribed therefor duly indicating annual turnover. These certificates shall be valid for one year from the date of issue or for the period prescribed therein for all tenders submitted during the period.

11.3 **PREVIOUS EXPERIENCE** : A statement giving particulars (duly supported by documentary evidence) of the various service rendered in progress for each similar works by the tenderer indicating the particulars and value of each work, the site location, the duration, date of completion etc., strictly as per proforma enclosed at **ANNEXURE-B**.

11.4 **ORGANISATION CHART** : The organisation pattern that are totally available with him and that will be employed by the tenderer for this work in the form of monthwise and categorywise deployment plan duly indicating the number of Engineers, Supervisors, skilled and unskilled workers etc., as per proforma enclosed at **ANNEXURE-C**.

11.5 An attested copy of the **Power of Attorney**, in case the tender is signed by an individual other than the sole Proprietor, shall also be attached.

11.6 **IN CASE OF AN INDIVIDUAL** : His full name, experience, address and nature of business.

OR

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

OR

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

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

11.8 Analysis of unit rate quoted as per proforma enclosed at **ANNEXURE-E**.

11.9 Declaration sheet as per proforma enclosed at **ANNEXURE-F**.

11.10 In addition to the above, the particulars required elsewhere in tender documents.

11.11 Checklist and schedule of general particulars duly filled in, signed and stamped as per **ANNEXURE-G**.

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

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

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

- 12.1 **Cash(As permissible under Income Tax Act)** : The amount should be remitted by the party to the Cashier of Bharat Heavy Electricals Limited and cash receipt issued by him shall be enclosed alongwith the tender.
- 12.2 Pay Order or Demand Draft in favour of Bharat Heavy Electricals Limited, Noida.
- 12.3 Tenders received without Earnest Money in full in the manner prescribed above will not be considered.
- 12.4 The Earnest Money Deposit of the successful tenderer will be retained towards part of Security Deposit.
- 12.5 In the case of unsuccessful tenderers, the Earnest Money will be refunded normally within fifteen days of acceptance of award of work by the successful tenderer.
- 12.6 BHEL reserves the right of **forfeiture of Earnest Money deposit** in case the successful tenderer,
- (a) After opening of Tender, revokes his tender within the validity period or increases his earlier quoted rates.
- (b) Does not commence the work within the period as per LOI/Contract. In case the LOI/Contract is silent in this regard then within 15 days after award of contract.
- 12.7 EMD shall not carry any interest.
- 12.8 Tenderers, who so ever desires, may deposit one time Earnest Money Deposit of Rs. 2,00,000/- in cash(**As permissible under Income Tax Act**) /DD/pay order only with the cashier of BHEL. Tenderers who furnish one time EMD as above, will not be required to furnish EMD time and again alongwith their tenders submitted to BHEL/ PSNR. However they will be required to indicate the cash receipt No. and date of one time EMD in all their tenders.
- 13 **AUTHORISATION AND ATTESTATION** : Tenders shall be signed by persons duly authorised / empowered to do so. Certified copies of such authority and relevant documents shall be submitted alongwith the tenders.
- 14 **VALIDITY OF OFFER** : *THE OFFER SHALL BE KEPT OPEN FOR ACCEPTANCE FOR A MINIMUM PERIOD OF SIX MONTHS FROM THE DATE OF OPENING OF TENDERS.* In case Bharat Heavy Electricals Limited calls for negotiations, such negotiations shall not amount to cancellation or withdrawal of the original offer which shall be binding on the tenderers.
- 15 **EXECUTION OF CONTRACT** :The successful tenderer's responsibility under this contract commences from the date of issue of the Letter of Intent by Bharat Heavy Electricals Limited. The successful tenderer shall be required to execute an agreement in the prescribed form as per **ANNEXURE-'I'** with the BHEL within a reasonable time after the acceptance of his tender and in any case before submitting the first bill for payment.
- 16.0 **SECURITY DEPOSIT** : Upon acceptance of tender, the successful tenderer must deposit the required amount of security deposit within the time specified in the Letter of Intent for satisfactory completion of work.
- 16.1 The total amount of Security Deposit shall be as follows :
- (a) In case of work costing upto 10 lakhs : 10% of the contract value.
- (b). In case of work costing above Rs 10 lakhs and upto Rs 50 lakhs : 1 Lakh + 7.5 % of the amount exceeding Rs. 10 Lakhs.

(c). In case of work costing more than Rs 50 lakhs : 4 Lakhs + 5 % of the amount exceeding Rs. 50 Lakhs.

16.2 The Security Deposit will be deposited within 15 days from the date of issue of Letter of Intent but before start of work in any one of the following forms :-

(a). The total Security Deposit as indicated in the Letter of Intent in **cash** (As permissible under Income Tax Act).

(b) Pay Order, Demand Draft in favour of BHEL.

(c) Local cheques of scheduled banks, subject to realization.

(d) Securities available from Post Offices such as National Savings Certificates, Kisan Vikas Patras etc.
(Certificates should be held in the name of Contractor furnishing the security and duly pledged in favour of BHEL and discharged on the back).

(e) Bank Guarantee from Scheduled Banks / Public Financial Institutions as defined in the Companies Act subject to a maximum of 50% of the total security deposit value. The balance 50% has to be remitted either by cash or in the other form of security. The Bank Guarantee format should have the approval of BHEL.

(f) Fixed Deposit Receipt issued by Scheduled Banks / Public Financial Institutions as defined in the Companies Act . The FDR should be in the name of the contractor, A/C BHEL, duly discharged on the back.

(g) Security deposit can also be recovered at the rate of 10% from the running bills. However in such cases at least 50% of the Security Deposit should be collected before start of the work and the balance 50% may be recovered from the running bills.

(h) EMD of the successful tenderer shall be converted and adjusted against the security deposit.

16.3 The security deposit shall not carry any interest.

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

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

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

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

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

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

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

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

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

- 17 **No interest** shall be payable by BHEL on Earnest Money Deposit, Security Deposit or on any moneys due to the contractor.
- 18 **REJECTION OF TENDER AND OTHER CONDITIONS :**
- 18.1 The acceptance of Tender will rest with BHEL which does not bind itself to accept the lowest tender or any tender and reserves to itself full rights for the following without assigning any reasons whatsoever.
- (a) To reject any or all of the tenders.
 - (b) To split up the work amongst two or more Tenderers.
 - (c) To award the work in part.
 - (d) In either of the contingencies stated in (b) and (c) above to modify the time for completion suitably.
- 18.2 Conditional and un-witnessed tenders, tenders containing absurd or unworkable rates and amounts, tenders which are incomplete or otherwise considered defective and tenders not in accordance with the tender conditions, specifications, etc., are liable to be rejected.
- 18.3 If a tenderer expires after the submission of his tender or after the acceptance of his tender, BHEL may at its discretion, cancel such tender. If a partner of a firm expires after the submission of the tender or after the acceptance of the tender, BHEL may cancel such tender at its discretion unless the firm retains its character.
- 18.4 BHEL will not be bound by any Power of Attorney granted by the tenderer or by changes in the composition of the firm made subsequent to the execution of the contract. BHEL may, however, recognise such Power of Attorney and changes after obtaining proper legal advice, the cost of which will be chargeable to the contractor concerned.
- 18.5 If the tenderer deliberately gives wrong information in his tender, BHEL reserves the right to reject such tender at any stage or to cancel the contract, if awarded and forfeit the Earnest Money/ Security Deposit/ any other moneys due.

- 18.6 Canvassing in any form in connection with the tender is strictly prohibited and the tenders submitted by the contractor who resorts to canvassing are liable to be rejected.
- 18.7 Should a tenderer or contractor or in the case of a firm or Company of contractors/ one or more of its Partners/ share holders / Directors have a relation or relations employed in BHEL, the authority inviting tender shall be informed to the fact alongwith the offer, failing this BHEL may, at its sole discretion reject the tender or cancel the contract and forfeit the Earnest Money/ Security Deposit
- 18.8 The successful tender should not sub-contract the part or complete work detailed in the tender specification without written permission of BHEL. The tenderer is solely responsible to BHEL for the work awarded to him.
- 18.9 **NO DEVIATIONS** to the tender conditions will normally be accepted. however, if the tenderer insists for certain deviations to the conditions, financial implication thereof shall be loaded to the quoted price for evaluating the tenderer's offer.

SECTION - II

GENERAL TERMS AND CONDITIONS

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

- 19.9 **'TENDER SPECIFICATIONS'** shall mean the Special Conditions, Technical Specifications, appendices, Site information and drawings pertaining to the work for which the tenderers are required to submit their offer. Individual Specifications Number will be assigned to each tender specifications.
- 19.10 **'TENDER DOCUMENTS'** shall mean the General Conditions of Contract (19.8) and Tender Specifications (19.9).
- 19.11 **'LETTER OF INTENT'** shall mean the intimation by a letter / telegram / telex / fax to the tenderer that the tender has been accepted in accordance with provisions contained in the letter. The responsibility of the contractor commences from the date of issue of this letter and all the terms and conditions of contract are applicable from this date.
- 19.12 **'COMPLETION TIME'** shall mean the period by date specified in the Letter of Intent or date mutually agreed upon for handing over the erected equipment/ plant which are found acceptable by the Engineer being of required standard and conforming to the specifications of the Contract.
- 19.13 **'PLANT'** shall mean and connote the entire assembly of the plant and equipment covered by the Contract.
- 19.14 **'EQUIPMENT'** shall mean all equipment, machineries, materials, structurals, electricals and other components of the plant covered by the Contract.
- 19.15 **'TESTS'** shall mean and include such test or tests to be carried out by the contractor as are prescribed in the Contract or considered necessary by BHEL in order to ascertain the quality, workmanship, performance and efficiency of the contracted work or part there of.
- 19.16 **'APPROVED', 'DIRECTED' or 'INSTRUCTED'** shall mean approved, directed or instructed by BHEL.
- 19.17 **'WORK' or 'CONTRACT WORK'** shall mean and include supply of all categories of labour, specified consumables, tools and tackles required for complete and satisfactory site transportation, handling, stacking, storing, erecting, testing and commissioning of the equipment to the entire satisfaction of BHEL.
- 19.18 **'SINGULAR' and 'PLURAL'** etc. Words carrying singular number shall also include plural and vice versa where the context so requires. Words importing masculine gender shall be taken to include the feminine gender and words importing persons shall include any Company or Association or Body of Individuals, whether incorporated or not.
- 19.19 **'HEADINGS'** The headings in these General Conditions are solely for the purpose of facilitating reference and shall not be deemed to be part thereof or be taken into consideration in the interpretation or construction thereof or the contract.
- 19.20 **'MONTH'** shall mean calendar month.
- 19.21 **'WRITING'** shall include any manuscript, type written or printed statement under the signature or seal as the case may be.
- 20 **LAW GOVERNING THE CONTRACT AND COURT JURISDICTION:** The Contract shall be governed by the Law for the time being in force in the Republic of India. The Civil Court at Delhi/ New Delhi, having ordinary Original Civil Jurisdiction shall alone have exclusive jurisdiction in regard to all claims in respect of this Contract.
- 21 **ISSUE OF NOTICE** The Contractor shall furnish to the Engineer, the name, designation and address of his authorised agent and all complaints, notices,

communications and references shall be deemed to have been duly given to the Contractor, if delivered to the Contractor or his authorised agent or left at or posted to the address either of the contractor or his authorised agent and shall be deemed to have been so given in the case of posting on the day on which they would have reached such address in the ordinary course of post or at which they were so delivered or left.

22 **USE OF LAND** No land belonging to BHEL or its customer under temporary possession of BHEL shall be occupied by the Contractor without the written permission of BHEL.

23 **COMMENCEMENT AND COMPLETION OF WORK**

23.1 The contractor shall commence the work within the time indicated in the Letter of Intent and shall proceed with the same with due expedition without delay.

23.2 If the successful tenderer fails to commence the work within the stipulated time, BHEL, at its sole discretion, will have the right to cancel the contract. His Earnest Money and/ or Security Deposit will stand forfeited without any further reference to him without prejudice to any and all of BHEL's other rights and remedies in this regard.

23.3 All the works shall be carried out under the direction and to the satisfaction of BHEL.

23.4 The transported equipment, erected /constructed plant or work performed under the Contract, as the case may be, shall be taken over when it has been completed in all respects and/or satisfactorily put into operation at site.

24 **MEASUREMENT OF WORK AND MODE OF PAYMENT**

24.1 All payments due to the contractor shall be made by 'Account Payee' Cheques.

24.2 For progress/ running bill payments, the contractor shall present detailed measurement sheets in triplicate duly indicating all relevant details based on technical documents and connected drawings for the work done during the month/ period under different categories in line with terms of payment as per Letter of Intent. The basis of arriving at the quantities/ weights shall be the relevant documents and drawings released by BHEL. These measurement sheets shall be prepared jointly with Engineer and signed by both the parties.

24.3 These measurement sheets will be checked by the Engineer and quantities and percentages eligible for payment under different groups shall be decided by him. The abstract of quantities and percentages so arrived at based on the terms of payment shall be entered in the **Measurement Book and signed by both the parties.**

24.4 Based on the above quantities, contractor shall prepare the bills in the prescribed proforma and work out the financial value. These will be entered in the Measurement Book and signed by both the parties. Payment shall be made by BHEL after effecting the recoveries due from the contractor.

24.5 All recoveries due from the contractor for the month / period shall be effected in full from corresponding running bills unless specific approval from Competent authority is obtained to the contrary.

24.6 Measurement shall be restricted to that quantity for which it is required to ascertain the financial liability of BHEL under this contract.

24.7 Measurement shall be taken jointly by persons duly authorised by BHEL and the Contractor.

24.8 The Contractor shall bear the expenditure involved, if any, in making the measurements and testing of materials to be used/ used in the work. The Contractor shall, without extra

cost to BHEL, provide all the assistance with appliances and other things necessary for measurement.

- 24.9 If, at any time due to any reason whatsoever, it becomes necessary to re-measure the work done, in full or in part, the expenses towards such remeasurement shall be borne by the Contractor.
- 24.10 ***Passing of bills covered by such measurements does not amount to acceptance by BHEL of the completion of the work measured. Any left out work has to be completed by the Contractor, as directed.***
- 24.11 Final measurement bill shall be prepared in the proforma prescribed for the purpose, based on the certificate issued by the Engineer that the entire work as stipulated in the tender specifications has been completed in all respects to the entire satisfaction of BHEL. The Contractor shall give unqualified 'No Claim' and 'No Demand' certificates. All the tools and tackles loaned to him should be returned in condition satisfactory to BHEL. The abstract of final quantities and financial values shall also be entered in the Measurement Book and signed by both the parties. The final bill shall be paid within a reasonable time after completion of the work. After the payment of final bill, only the guarantee obligation percentage value shall remain unpaid which shall be released in accordance with clause 32.

25 RIGHTS OF BHEL

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

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

- 25.4 To recover any moneys due from the Contractor from out of any moneys due to the Contractor under this or any other Contract or from the Security Deposit.
- 25.5 To claim compensation for losses sustained including BHEL's supervision charges and overheads in case of termination of contract and to levy liquidated damages for delay in completion of work, at the rate of 1/2% of the contract value per week of delay or part thereof subject to a ceiling of **10% of the contract value**.
- 25.6 To determine the Contract or to restrict the quantum of work and pay for the portion of work done in case BHEL's contract with its customer is terminated for any reason.
- 25.7 To effect recoveries from any amounts due to the contractor under this or any other contract or in any other form the moneys which BHEL is forced to pay to anybody due to contractor's failure to fulfil any of his obligations.
- 25.8 To restrict or increase the quantity and nature of work to suit site requirements, since the tender specification is based on preliminary documents and quantities furnished therein are indicative and approximate and the rates quoted shall not be subject to revision.
- 25.9 To deploy BHEL's skilled and semiskilled workmen in case of emergency / poor progress/ deficiency in skill on the part of the employees of the contractor and to recover the expenditure on account of the same from the moneys due to the contractor.
- 25.10 While every endeavor will be made by BHEL to this end, BHEL can not guarantee uninterrupted work due to conditions beyond its control. The Contractor will not be entitled to any compensation/ extra payment on this account.
- 25.11 In the event of any dispute of technical nature, the decision of BHEL shall be final and binding on the Contractor.

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

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

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

operations connected with this contract. In case BHEL is forced to make any such payment, BHEL shall recover the same from the contractor either from moneys due to him or otherwise as deemed fit.

- 26.6 While BHEL will pay the **inspection fees of the Boiler/ Electrical** Inspectorate, all other arrangements for the periodical visits of Boiler/ Electrical Inspector to site, inspection certificates etc. will have to be made by the contractor at his cost. The contractor will also meet all expenses in connection with his welder's qualification/ requalification tests etc.
- 26.7 The contractor shall be responsible for the provision of health and sanitary arrangements more particularly described in the Contract Labour (Regulations and Abolition Act, 1970) and safety precautions as may be required for safe and satisfactory execution of the contract.
- 26.8 The contractor shall be responsible for proper accommodation including adequate medical facilities for the personnel employed by him.
- 26.9 The contractor shall be responsible for the proper behavior and observance of all regulations by the staff employed by him.
- 26.10 The contractor shall ensure that no damage is caused to any person / property of other parties working at site. If any such damage is caused, it shall be the responsibility of the contractor to make good the losses and compensate them.
- 26.11 All the properties/ equipment/ components of BHEL/ its customer loaned with or without deposit, to the contractor shall remain the properties of BHEL/ its customer. The contractor shall use such properties for the purpose of execution of this contract. All such properties/ equipment/ components shall be taken to be in good condition unless notified to the contrary by the contractor within 48 hours. The contractor shall return them in good condition as and when required by BHEL/ its customer. In case of non-return, loss, damage, repairs etc., the cost thereof, as may be fixed by the Engineer, will be recovered from the contractor.
- 26.12 It shall not be obligatory on the part of BHEL to supply any tools and tackles or materials other than those specifically agreed to be given by BHEL. However, depending upon availability / possibility, BHEL/ its customer's equipment and other materials may be made available to the contractor on payment of hire charges as fixed by them , subject to the conditions laid down by BHEL/ its customer from time to time. Unless paid in advance, such hire and other charges shall be recovered from out of dues to the contractor or security deposit in one installment.
- 26.13 The contractor shall fully indemnify and keep indemnified BHEL/ its customer against all claims of whatever nature arising during the course of execution of this contract.
- 26.14 In case the contractor is required to undertake any work outside the scope of this contract, the amount payable shall be as may be mutually agreed upon.
- 26.15 Any delay in completion of works or non-achievement of periodical targets, due to reasons attributable to the contractor, will have to be compensated by the contractor either by increased manpower and resources or by working extra hours or more than one shift at no extra cost to BHEL.
- 26.16 The contractor shall execute the work under the conditions usual to such power plant construction and in conjunction with numerous other operations at site. The contractor and his personnel shall cooperate and coordinate with other agencies at project site and proceed in a manner that shall help in the progress of work at site as a whole.

- 26.17 The contractor will be directly responsible for payment of wages to his workmen. A payroll sheet giving details of all payments made to the workmen duly signed by the contractor's representative should be furnished to BHEL, if called for.
- 26.18 In case of any class of work for which there is no specification laid down in the contract, such work shall be carried out in accordance with the instructions and requirements of the Engineer.
- 26.19 No levy, payment or charges made or imposed shall be impeached by reason of any clerical error or by reason of any mistake in the amount levied, demanded or charged.
- 26.20 ***No idle labour charges will be admissible in the event of any stoppage of work resulting in the contractor's workmen being rendered idle due to any reason at any time.***
- 26.21 The contractor shall take all reasonable care to protect the materials and the work till such time the plant / equipment has been taken over by BHEL / its customer.
- 26.22 Contractor shall not stop work or abandon the site for whatsoever reason or dispute, excepting for force majeure conditions. All problems / disputes shall be separately discussed and settled without effecting the progress of work. Stoppage or abandonment of work, other than under force majeure conditions, shall be treated as breach of work of contract and dealt with accordingly.
- 26.23 The contractor shall keep the area of work clean and shall remove the debris etc. while executing day-to-day work. Upon completion of work, the contractor shall remove from the vicinity of work, all scrap, packing materials, rubbish, unused and other materials and deposit them in places specified by the Engineer. The contractor will also demolish all the hutments, sheds, offices, etc. constructed and used by him and shall clean the debris. In the event of his failure to do so, the same will be arranged to be done by the Engineer and the expenses recovered from the contractor.
- 26.24 The contractor shall execute the work in the most substantial and workman like manner in the stipulated time. Accuracy of work and timely execution shall be the essence of this contract. The contractor shall be responsible to ensure that the quality, assembly and workmanship conform to the dimensions and clearance given in the drawings and/ or as per the instructions of the Engineer.
- 26.25 The contractor shall furnish fortnightly labour deployment report indicating the classification and number of workmen engaged, date wise and category wise. Besides, the contractor shall also furnish progress reports on work at regular intervals as required by the Engineer.
- 27 **RESPONSIBILITIES OF CONTRACTOR IN RESPECT OF SAFETY OF MEN, EQUIPMENT, MATERIAL AND ENVIRONMENT.**
- 27.1 All safety rules and codes applied by BHEL and its customer at site shall be observed by the contractor and his workmen without exception. The contractor shall be responsible for the safety of the equipment / material and work to be performed by him and shall maintain all lights, fencing guards, signs etc. or other protections necessary for the purpose. Contractor shall also take such additional precautions as may be indicated from time to time by the Engineer, with a view to prevent pilferage, accidents, fire hazards etc. Suitable number of clerical staff, watch and ward, store keepers to take care of equipment, materials, construction tools and tackles shall be posted at site by the contractor till the completion of the work under this contract. The contractor shall arrange for such safety devices as are necessary for this type of work and carry out the requisite site tests of handling equipment, lifting tools, tackles etc. as per usual standards and practices.

- 27.2 The contractor shall provide to its work force and ensure the use of the following personal protective equipment as found necessary and as directed by the authorized BHEL officials.
- (a) Safety Helmets conforming to IS-2925
 - (b) Safety Belts conforming to IS-3521
 - (c) Safety shoes conforming to IS-1989
 - (d) Eye & Face Protection devices conforming to IS-8520 and IS-8940
 - (e) Hand & body protection devices conforming to IS-2573, IS-6994, IS-8807 & IS-8519.
- 27.3 All tools, tackles, lifting appliances, material handling equipment, scaffolds, cradles, safety nets, ladders, equipment etc. used by the contractor shall be of safe design and construction. These shall be tested and certificate of fitness obtained before putting them to use and from time to time as instructed by authorized BHEL official who shall have the right to ban the use of any item.
- 27.4 All electrical equipment, connections and wiring for construction power, its distribution and use shall conform to the requirements of Indian Electricity Act and Rules. Only electricians licensed by the appropriate statutory authority shall be employed by the contractor to carry out all types of electrical works. All electrical appliances including portable electric tools used by contractor shall have safe plugging system to source of power and be appropriately earthed.
- 27.5 The contractor shall not use any hand lamp energised by electric power with supply voltage of more than 24 volts. For work in confined spaces, lighting shall be arranged with power source of not more than 24 volts.
- 27.6 Where it becomes necessary to provide and / or store petroleum products, explosives, chemicals and liquid or gaseous fuel or any other substance that may cause fire or explosion, the contractor shall be responsible for carrying out such provision and/or storage in accordance with the rules and regulations laid down in the relevant Government Acts, such as Petroleum Act, Explosives Act, petroleum and Carbides of Calcium Manual of the Chief Controller of Explosives, Government of India etc. Prior approval of the authorised BHEL official at the site shall also be taken by the contractor in all such matters.
- 27.7 The contractor shall arrange at his cost (wherever not specified) appropriate illumination at all work spots for safe working, when natural daylight may not be adequate for clear visibility.
- 27.8 In case of a fatal or disabling injury / accident to any person at construction sites due to lapses by the contractor, the victim and / or his / her dependents shall be compensated by the contractor as per statutory requirements. However, if considered necessary, BHEL shall have the right to impose appropriate financial penalty on the contractor and recover the same from payments due to the contractor for suitably compensating the victim and / or his / her dependents. Before imposing any such penalty, appropriate enquiry shall be held by BHEL giving opportunity to the contractor to present his case.
- 27.9 In case of any damage to property due to lapses by the contractor, BHEL shall have the right to recover the cost of such damages from the payments due to the contractor after holding an appropriate enquiry.
- 27.10 In case of any delay in the completion of a job due to mishaps attributable to lapses by the contractor, BHEL shall have the right to recover cost of such delay from the payments due to the contractor, after notifying the contractor suitably and giving him opportunity to present his case.
- 27.11 If the contractor fails to improve the standards of safety in its operation to the satisfaction of BHEL after being given reasonable opportunity to do so and / or if the

contractor fails to take appropriate safety precautions or to provide necessary safety devices and equipment or to carry out instructions regarding safety issued by the authorized BHEL official, BHEL shall have the right to take the corrective steps at the risk and cost of the contractor after giving a notice of not less than seven days indicating the steps that would be taken by BHEL.

- 27.12 The contractor shall submit report of all accidents, fires, property damage and dangerous occurrences to the authorized BHEL official immediately after such occurrence, but in any case not later than 12 hours of the occurrence. Such reports shall be furnished in the manner prescribed by BHEL. In addition, periodic reports on safety shall also be submitted by contractor to the authorized BHEL official from time to time as prescribed.
- 27.13 During the course of construction, alteration or repairs scrap lumbers with protruding nails, sharp edges etc., and all other debris including combustible scrap shall be kept cleared from working areas, passage ways and stairs in and around site.
- 27.14 Cylinders shall be moved by tilting and rolling them on their bottom edges. They shall not be intentionally dropped, struck or permitted to strike each other violently. When cylinders are transported by powered vehicles, they shall be secured in a vertical position.
- 27.15 The contractor shall be responsible for the safe storage of his radioactive sources.
- 27.16 All the contractor's supervisory personnel and sufficient number of workers shall be trained for fire fighting and shall be assigned specific fire protection duties. Enough number of such trained personnel must be available during the tenure of the contract.
- 27.17 Contractor shall provide enough fire protecting equipment of the types and numbers at his office, stores, erection site, other temporary structures, labour colony area etc. Access to such fire protection equipment shall be easy and kept open at all times. Compliance of the above requirement under fire protection shall in no way relieve the contractor of any of his responsibility and liabilities to fire accident occurring. In the event fire safety measures are not to BHEL's satisfaction, BHEL shall have option to provide the same and recover the cost plus incidentals from contractor's bills and / or impose penalty as deemed fit by the Engineer.
- 27.18 Before commencing the work, the contractor shall appoint /nominate a responsible officer to supervise implementation of all safety measures and liaison with his counterpart of BHEL.
- 27.19 If safety record of the contractor in execution of the awarded job is to the satisfaction of Safety Department of BHEL, issue of an appropriate certificate to recognize the safety performance of the contractor may be considered by BHEL after completion of the job.

28.0 CONSEQUENCES OF CANCELLATION

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

BHEL with an addition of such percentage to cover supervision and establishment charges as may be decided by BHEL.

29.0 INSURANCE

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

30.0 STRIKES AND LOCKOUTS

- 30.1 The contractor will be solely responsible for all disputes and other issues connected with his workmen. In the event of contractor's workmen resorting to strike or the contractor resorting to lockout and if the strike or lockout so declared is not settled within a period of one month, BHEL shall have the right to get the erection work executed by employing its own men or through other agencies or both. The cost incurred by BHEL in this regard shall be recovered from the contractor.
- 30.2 For any purpose whatsoever, the employees of the contractor shall not be deemed to be in the employment of BHEL.

31.0 FORCE MAJEURE

31.1 The following shall amount to force majeure conditions. Acts of God, Act of any Government, War, Sabotage, Riots, Civil Commotion, Police Action, Revolution, Flood, Fire, Cyclone, Earthquake and Epidemic and other similar causes over which the contractor has no control.

31.2 If the contractor suffers delay in the due execution of the contract, due to delays caused by force majeure conditions, as defined above, the agreed time for completion of the work covered by this contract shall be extended by a period of time equal to the period of delay, provided that on the occurrence of any such contingency, the contractor immediately reports to BHEL in writing the causes for the delay but the Contractor shall not be eligible for any compensation on this account.

32.0 **GUARANTEE** Even though the work will be carried out under the supervision of the Engineer, the contractor will be responsible for the quality of the workmanship and shall guarantee the work done for a period of twelve months from the date of completion of work as certified by the Engineer, and shall rectify, free of cost to BHEL, all defects arising out of faulty erection during the guarantee period starting from the date of completion of rectification. In the event of the contractor failing to repair the defective works within the time specified by the Engineer, BHEL may proceed to undertake the repairs of such defective works at the contractor's risk and cost, without prejudice to any other rights and recover the same from out of any moneys payable to the contractor or by other legal means.

33.0 **ARBITRATION** : All disputes between the parties to the contract arising out of or in relation to the contract, other than those for which the decision of the Engineer or any other person is by the contract expressed to be final and conclusive, shall after written notice by either party to the contract to the other party, be referred to sole arbitration of the General Manager or his nominee. The arbitration shall be conducted in accordance with the provisions of the Arbitration and Reconciliation Act, 1996. The parties to the contract understand and agree that it will be no objection that the General Manager or the person nominated as Arbitrator had earlier in his official capacity to deal directly or indirectly with the matters to which the contract relates or that in the course of his official duties had expressed views on all or any of the matters in dispute or difference. The award of the Arbitrator shall be final and binding on the parties to this contract. In the event of the Arbitrator dying, neglecting or refusing to act or resigning or being unable to act for any reason or his award being set aside by the Court for any reason, it shall be lawful for the General Manager or his successor, as the case may be, either to act himself as the Arbitrator or to appoint another Arbitrator in place of the outgoing Arbitrator in the manner aforesaid. The Arbitrator may, from time to time, with the consent of both the parties to the contract, enlarge the time for making the award. Work under the contract shall be continued during the arbitration proceedings. The venue of the arbitration shall be the place from which the contract is issued or such other place as the Arbitrator at his discretion may determine.

--X--X--

FINANCIAL VIABILITY

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

(Signature of tenderer)
With Stamp

NOTE:

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

ANALYSIS OF UNIT RATE QUOTED

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

(SIGNATURE OF TENDERER)
WITH STAMP

DECLARATION SHEET

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

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

Tenderer's Name & Address

Authorised representative's signature with name and address.

CHECKLIST AND SCHEDULE OF GENERAL PARTICULARS

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

1. Name and address of the tenderer
2. Telegraphic/ telex address
3. Phone No. (Office)/ Fax No.
4. Name & designation of the official of the tenderer to whom all the references shall be made.
5. Tenderer's proposal No. & date
6. Whether EMD submitted (By cash/Pay order / bank draft) by.....
7. Validity of offer/ rates quoted for six months from the date of opening of tender Yes/No
8. Financial Status as per Clause 11.1 (in the format as per Annexure-A) Yes/No
9. Income tax Clearance certificate as per Clause 11.2 Yes/No

- | | |
|--|--------|
| 10. Details of experience as per clause 11.3
(in the format as per Annexure-B) | Yes/No |
| 11. Monthwise & Categorywise manpower deployment
plan as per Clause 11.4
(in the format as per Annexure-C) | Yes/No |
| 12. Attested copy of power of attorney as per clause 11.5 | Yes/No |
| 13. Details about type of the firm as per clause 11.6 | Yes/No |
| 14. Status of T&P and monthwise deployment plan
as per clause 11.7 (in the format as per Annexure-D) | Yes/No |
| 15. Analysis of unit rate quoted as per Clause 11.8
(in the format as per Annexure-E) | Yes/No |
| 16. Declaration sheet as per clause 11.09
(in the format as per Annexure-F) | Yes/No |

Date _____

(SIGNATURE OF TENDERER)
WITH STAMP

WITNESS
(SIGNATURES WITH FULL PARTICULARS)

1.

2.

AGREEMENT

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

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

AND

M/S _____ (hereinafter called the 'Contractor') of the SECOND PART.

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

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

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

1. That the contractor shall execute the work of -----and more particularly described in Tender Specification No -----including Drawings and Specifications (hereinafter called the said works) in accordance with and subject to terms and conditions contained in these presents, instructions to Tenderers, General Conditions of Contract, Special Conditions, Annexures, Letter of Intent dated -----and such other instructions, Drawings, Specifications given to him from time to time by BHEL.
2. The Contractor is required to furnish to BHEL Security deposit in the form of cash/ approved securities/ Bank Guarantee valid upto ----- for a sum of Rs.----- - towards satisfactory performance and completion of the Contract.
3. The Contractor has furnished a Bank Guarantee bearing no.-----dated -----for a sum of Rs.-----executed by ----- in favour of BHEL towards Security Deposit valid upto -----

OR

The Contractor has furnished to BHEL an initial Security Deposit of Rs.----- in the form of cash / approved Securities/ B.G No.----- dated ----- for Rs.-----executed by ----- in favour of BHEL valid upto -----

----- and has agreed for recovery of the balance security deposit by BHEL @ 10% of the value of work done from each running bill till the entire Security Deposit is recovered.

OR

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

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

OR

In case the contractor furnishes the bank guarantee at a later date the contractor hereby agrees to extend the validity of bank guarantee for such further period or periods as may be required by BHEL and if the contractor fails to obtain such extension(s) from the bank, the contractor shall pay forthwith or accept recovery of the amount of bank guarantee given in lieu of security deposit from the bills in one installment and the contractor further agrees that failure to extend the validity of bank guarantee or failure to pay the aforesaid amount in the manner specified above shall constitute breach of contract. In addition to above, BHEL shall be entitled to take such action as deemed fit and proper for recovering the said sum.

5. That in consideration of the payments to be made to the Contractor by BHEL in accordance with this Agreement the Contractor hereby covenants and undertakes with BHEL that they shall execute, construct, complete the works in conformity, in all respects, with the terms and conditions specified in this Agreement and the documents governing the same.
6. That the Contractor shall be deemed to have carefully examined this Agreement and the documents governing the same and also to have satisfied himself as to the nature and character of the Works to be executed by him.
7. That the Contractor shall carry out and complete the execution of the said works to the entire satisfaction of the Engineer or such other officer authorised by BHEL, within the agreed time schedule, the time of completion being the essence of the Contract.
8. That BHEL shall, after proper scrutiny of the bills submitted by the Contractor, pay to him during the progress of the said works such sum as determined by BHEL in accordance with this Agreement.
9. That this Agreement shall be deemed to have come into force from ----- the date on which the letter of intent has been issued to the Contractor.
10. That whenever under this contract or otherwise, any sum of money shall be recoverable from or payable by the Contractor, the same may be deducted in the manner as set out in the General Conditions of Contract or other conditions governing this Agreement.

11. That all charges on account of Octroi, Terminal and other taxes including sales tax or other duties on material obtained for execution of the said works shall be borne and paid by the Contractor.
12. That BHEL shall be entitled to deduct from the Contractor's running bills or otherwise Income Tax under Section 194 (C) of the Income Tax Act, 1961.
13. That BHEL shall be further entitled to recover from the running bills of the Contractor or otherwise such sum as may be determined by BHEL from time to time in respect of consumables supplied by BHEL, hire charges for tools and plants issued (Where applicable) and any other dues owed by the Contractor.
14. That it is hereby agreed by and between the parties that non- exercise, forbearance or omission of any of the powers conferred on BHEL and /or any of its authorities will not in any manner constitute waiver of the conditions hereto contained in these presents and the liability of the Contractor with respect to compensation payable to BHEL or Contractor's obligations shall remain unaffected.
15. It is clearly understood by and between the parties that in the event of any conflict between the Letter of Intent and other documents governing this Agreement, the provisions in the Letter of Intent shall prevail.
16. The following documents
 1. Invitation to Tender No-----
and the documents specified therein.
 2. Contractor's Offer No----- dated-----.
 3. _____
 4. _____
 5. _____
 6. Letter of Intent No_____ dated_____.
 7. _____

shall also form part of and govern this Agreement.

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

WITNESS

1.

2.

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

WITNESS

1.

2.

(For and on behalf of BHEL)

ANALYSIS OF SIMILAR JOBS EXECUTED / IN PROGRESS

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

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

(SIGNATURE OF TENDERER)
WITH STAMP

MONTHWISE MANPOWER DEPLOYMENT PLAN

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

(SIGNATURE OF TENDERER)
WITH STAMP

ANNEXURE – D

(A) STATUS OF TOOLS & PLANTS

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

(B) MONTHWISE T&P DEPLOYMENT PLAN

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

(SIGNATURE OF TENDERER)
WITH STAMP

BANK GUARANTEE FOR SECURITY DEPOSIT

B.G. NO.

Date

This deed of Guarantee made this ----- day of -----two thousand by ----- (Bank) hereinafter called the "The Guarantor" (which expression shall unless repugnant to the context or meaning thereof be deemed to include its successors and assigns) in favour of M/s Bharat Heavy Electrical Limited (A Govt. of India Undertaking) a company incorporated under the Companies Act, 1956, having its registered office at BHEL House, Siri Fort, Asiad, New Delhi – 110049 through its unit at Power Sector – Northern Region, Noida, Distt. Gautam Budh Nagar, (UP) hereinafter called "The Company" (which expression shall unless repugnant to the context or meaning thereof be deemed to include its successors and assigns)

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

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

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

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

The decision of the company whether any default has occurred or has been committed by the contractor in the performance, observance or discharge of any of the terms, conditions, stipulations or undertakings or any one of them as contained in the contract and / or as to the extent of loss, damage, costs, charges and expenses caused to or suffered by the company by reason of the contractor making any default in the performance, observance or discharge of any of the terms, conditions, stipulations or undertakings or any one of them shall be conclusive and binding on the Guarantor irrespective of the fact whether the contractor admits or denies the default or questions the correctness of any demand made by the company in any Court, Tribunal or Arbitration proceedings or before any other Authority.

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

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

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

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

Notwithstanding anything contained herein before, our liability under the Guarantee is restricted to Rs.----- (Rupees-----). Our guarantee shall remain in force until -----, i.e. (the present date of validity of Bank Guarantee unless the date of validity of this Bank Guarantee is further extended from time to time) unless a claim or demand under this guarantee is made against us on or before --- ----- we shall be discharged from our liabilities under this Guarantee thereafter.

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

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

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

Signed for and on behalf of the Bank

(Signatory No.-----)

WITNESSES

1. Name & Address

2. Name & Address

Notes :

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

LIST OF MEMBER BANKS

- | | |
|---|---|
| 1. State Bank of India
CAG Branch,
10 th Floor, Vijaya Building,
Barakhamba Road,
New Delhi – 110001. | 9. HDFC Bank Ltd.,
5 th Floor, HT House,
K.G. Marg,
New Delhi – 110001. |
| 2. Canara Bank
74, Janpath,
New Delhi – 110001. | 10. Citi Bank N A
Jeevan Vihar Building,
Sansad Marg,
New Delhi – 110001. |
| 3. Punjab National Bank,
74, Janpath,
New Delhi – 110001. | 11. Standard Chartered Bank,
H2 Block, Connaught Place,
New Delhi – 110001. |
| 4. Bank of Baroda,
Corporate Banking Branch,
11 th Floor, BOB Building,
Sansad Marg,
New Delhi – 110001. | 12. ICICI Bank Ltd.,
ICICI Tower,
Bisham Pitamah Marg,
Pragati Vihar,
New Delhi – 110003. |
| State Bank of Hyderabad,
Surya Kiran Building, K.G. Marg,
New Delhi – 110001. | 13. IDBI Bank Ltd.,
19, K.G. Marg,
Surya Kiran Building,
New Delhi. |
| 5. State Bank of Mysore,
Antriksh Bhawan, K.G. Marg,
New Delhi – 110001. | 14. HSBC Ltd.,
ECE House,
28 KG Marg,
New Delhi – 110001. |
| 6. State Bank of Mysore,
Industrial Finance Branch,
18, Ramanashree Arcade,
M.G. Road, Bangaloe – 560001. | |
| 7. State Bank of Travancore,
Travancore House, IF Branch,
K.G. Marg, New Delhi – 110001. | |
| 8. Deutsche Bank,
Tolstoy Marg, New Delhi – 110001. | |

SECTION – I (a)
SPECIFICATION
FOR
HEALTH, SAFETY AND ENVIRONMENT (HSE)

1.0 SCOPE

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

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

2.0 REFERENCES

This document should be read in conjunction with following :

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

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

3.1 MANAGEMENT RESPONSIBILITY

3.1.1 The Contractor to comply with HSE requirement at Construction sites as enclosed to cover commitment of their organization to ensure health, safety and environment aspects in their line of operations.

3.1.2 The HSE management system shall cover the HSE requirements including but not limited to what is specified under Para 1.0 and para 2.0 above.

3.1.3 Contractor shall be fully responsible for planning and implementing HSE requirements. Contractor as a minimum requirement shall designate/deploy the following to co-ordinate the above :

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

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

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

3.2 HOUSE KEEPING

- 3.2.1 Contractor shall ensure that a high degree of house keeping is maintained and shall ensure interalia; the following :
 - a) All surplus earth and debris are removed / disposed off from the working areas to identified locations (s).
 - b) Unused/Surplus Cables, Steel items and steel scrap lying scattered at different places within the working areas are removed to identified locations (s).

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

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

3.3 HEALTH, SAFETY AND ENVIRONMENT

- 3.3.1 The Contractor shall provide safe means of access to any working place including provisions of suitable and sufficient scaffolding at various stages during all operations of the work for the safety of his workmen, and BHEL / Owner. Contractor shall ensure deployment of appropriate equipment and appliances for adequate safety and health of the workmen and protection of surrounding areas.
- 3.3.2 The contractor shall ensure that all their staff and workers wear Safety Helmet and Safety shoes. Contractor shall also ensure use of safety belt, protective goggles, gloves etc., by the personnel as per job requirements. All these gadgets shall conform to relevant IS specifications or equivalent.
- 3.3.3 The Contractor shall assign to his workmen, tasks commensurate with their qualification, experience and state of health for driving of vehicles, handling and erection of material and equipments. All lifting equipments shall be tested certified for its capacity before use. Adequate and suitable lighting at every work place and approach there to, shall be provided by the Contractor before starting the actual operations at night. It is mandatory for contractor to get his workmen medically examined / checked for fitness of work assigned once a year and furnish the certificate to that effect from RMP / Govt. Hospital.
- 3.3.4 Hazardous and / or toxic materials such as solvent, coating or thinners shall be stored in appropriate containers.
- 3.3.5 All hazardous materials shall be labeled with the name of the materials, the hazards associated with its use and necessary precautions to be taken.
- 3.3.6 Contractor shall ensure that during the performance of the work, all hazards of the health of personnel, have been identified, assessed and eliminated.

- 3.3.7 Chemical spills shall be contained and cleaned up immediately to prevent further contamination.
- 3.3.8 All personnel exposed to physical agents such as ionizing or non-ionizing radiation, ultraviolet rays or similar other physical agents shall be provided with adequate shielding or protection commensurate with the type of exposure involved.
- 3.3.9 Where contact or exposure of hazardous materials could exceed limits or could otherwise have harmful effects, appropriate personnel protective equipment such as gloves, goggles, aprons, chemicals resistant clothing and respirator shall be used.
- 3.3.10 All persons deployed at site shall be knowledgeable of and comply with the environmental laws, rules & regulations relating to the hazardous materials substances and wastes. Contractor shall not dump, release or otherwise discharge or dispose off any such materials without the express authorization of BHEL / Owner.

4.0 DURING JOB EXECUTION

- 4.1 Implement Health, Safety and Environment requirements including but not limited to as brought out under para 3.0. Contractor shall ensure to :
- arrange workmen compensation insurance, registration under ESI Act, third party liability insurance etc., as applicable.
 - arrange all HSE permits before start of activities (as applicable) like hot work, confined space, work at heights, storage of chemical / explosive materials and its use and implement all precautions mentioned therein.
 - Submit timely the completed checklist on HSE activities, Monthly HSE report, accident reports, investigation reports etc., as per BHEL / Owner requirements. Compliance of instructions on HSE shall be done by Contractor and informed urgently to BHEL / Owner.
 - Ensure the Resident Engineer / Site-Incharge of the Contractor shall attend all the Safety Committee / HSE meetings arranged by BHEL/Owner. In case of his absence from site that a second senior most person shall be nominated by him in advance and communicated to BHEL/Owner.
 - Display at site office and work locations caution boards, list of hospitals, emergency services available.
 - Display posters, banners made available by BHEL for safe working to promote safety consciousness.
 - Assist in HSE audits by BHEL / Owner and submit compliance report.
 - Generate and submit HSE records / report as per HSE plan.
 - Appraise BHEL / Owner on HSE activities at site.

ANNEXURE - I

RELEVANT IS – CODES FOR PERSONAL PROTECTION

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

ANNEXURE – II

1.0 HEALTH, SAFETY & ENVIRONMENT (HSE) PLAN

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

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

(To be prepared by each construction Agency)

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

PREPARED BY

REVIEWED BY

APPROVED BY
(RESIDENT ENGINEER)

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

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

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

INSPECTION BY:-----

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

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

HOUSING KEETING

Waste containers provided and used

Sanitary facilities adequate and clean

Passageways and Walkways Clear

General neatness of working areas

Others

PERSONNEL PROTECTIVE EQUIPMENT

Goggles: Shelds

Face protection

Hearing protection

Safety Shoes provided

Hand protection

Safety Belts

Others

EXCAVATIONS / OPENINGS

Openings properly covered or barricaded

Excavations shored

Excavations barricaded

Overnight lighting provided

Other

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

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

WELDING, CUTTING

Gas cylinders chained upright

Cables and hoses not obstructing

Screens or shields used

Flammable materials protected

Fire extinguisher (s) accessible

Other

SCAFFOLDING

Fully decked platforms

Guard and intermediate rails in place

Toe boards in place

Adequate shoring

Adequate access

Other

LADDERS

Extension side rails 1 m above

Top of landing

Properly secured

Angle + 70 from horizontal

Other

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

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

HOIST. CRANES AND DERRICKS

- Condition of cables and sheaves OK
- Condition of slings, chains, hooks & eyes O.K.
- Inspection and maintenance logs maintained
- Outriggers used
- Signs/barricades provided
- Signals observed and understood
- Qualified operators
- Other

MACHINERY, TOOLS AND EQUIPMENT

- Proper instruction
- Safety devices
- Proper cords
- Inspection and maintenance
- Other

VECHICLE AND TRAFFIC

- Rules and regulations observed
- Inspection and maintenance
- Licensed drivers
- Other

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

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

TEMPORARY FACILITIES

- Emergency instructions posted
- Fire extinguishers provided
- Fire-aid equipment available

Secured against storm damage
General neatness
In accordance with electrical requirements
Other

FIRE PREVENTION

Personnel instructed
Fire extinguishers checked
No smoking in Prohibited areas
Hydrants Clear
Other

ELECTRICAL

Proper wiring
ELCB's provided
Ground fault circuit interrupters
Protection against damage
Prevention of tripping hazards
Other

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

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

HANDLING AND STORAGE OF MATERIALS

Properly stored or stacked
Passageways clear
Other

FLAMMABLE GASES AND LIQUIDS

Containers clearly identified
Proper storage
Fire extinguishers nearby

Other

WORKING AT HEIGHT

Erection plan

Safety belts and lanyards; chute lines

Other

ENVIRONMENT

Chemical and other Effluents properly disposed

Cleaning liquid of pipes disposed off properly

Water used for hydrotesting disposed off as
Per agreed procedure

Lubricant Waste/Engine Oil properly disposed

Waste from Canteen, offices, sanitation etc.,
Disposed properly

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

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

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

**Signature of Resident
Engineer with Seal**

3.0 ACCIDENT CUM FIRE REPORT

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

Report : _____

Name of Site: _____ Date: _____

CONTRACTOR _____

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

BRIEF DESCRIPTION OF ACCIDENT

CAUSE OF ACCIDENT

NATURE OF INJURY/DAMAGE

MEDICAL AID PROVIDED/ACTIONS TAKEN

INTIMATION TO LOCAL AUTHORITIES

DATE: _____ **SIGNATURE OF CONTRACTOR**
_____ **WITH SEAL**

TO: SITE-IN-CHARGE/BHEL _____ **1 COPY**

4.0 SUPPLEMENTARY ACCIDENT & INVESTIGATION REPORT

Project: _____ Supplementary to Report

No. _____
_____ (Copy enclosed)

Site: _____

Date: _____

CONTRACTOR _____

NAME OF THE INJURED _____

FATHER'S NAME _____

SUB-CONTRACTOR _____
M/S _____

DATE & TIME OF ACCIDENT _____

LOCATION _____

BRIEF DESCRIPTION & CAUSE OF ACCIDENT

NATURE OF INJURY/DAMAGE

COMMENTS FROM MEDICAL PRACTITIONER, WHO ATTENDED THE VICTIM / INJURED

SUGGESTED IMPROVEMENT IN THE WORKING CONDITION, IF ANY

LOSS OF MANHOURS AND IMPACT ON SITE WORKS

ANY OTHER COMMENT BY SAFETY OFFICER

DATE: _____ **SIGNATURE OF CONTRACTOR**
_____ **WITH SEAL**

TO: SITE-IN-CHARGE/BHEL 1 COPY

5.0 MONTHLY HEALTH, SAFETY & ENVIRONMENT (HSE) REPORT

(To be submitted by each Contractor)

Actual work start Date: _____ For the month of

Project: _____ Report
No. _____

Name of the Contractor: _____ Status as
on: _____

Name of Work: _____ Name of safety
officer _____

<u>ITEM</u>	<u>THIS MONTH</u>	<u>CUMMULATIVE</u>
-------------	-------------------	--------------------

Total Strength (Staff + Workmen)

Number of HSE meetings organized at site

Number of HSE awareness programmes
Attended at site

Whether workmen compensation policy taken Y/N

Whether workmen compensation policy is valid Y/N

Whether workmen registered under ESI Act Y/N

Number of Fatal Accidents

Number of Loss Time Accidents (Other than Fatal) _____

Other accidents (Non Loss Time)

Total No. of Accidents

Total man-hours worked

Man-hour loss due to fire and accidents

Compensation cases raised with Insurance

Compensation cases resolved and paid to workmen

Remarks

Date _____ Safety Officer/Resident
Engineer

(Signature & Name)

To: SITE-IN-CHARGE,BHEL 1 COPY