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

No. BHE/PW/PUR/SLT-CWP/522

COLLECTION OF MATERIALS FROM BHEL/CLIENT'S STORES/STORAGE YARD INCLUDING LOADING; TRANSPORTATION TO SITE; ERECTION, TESTING, ASSISTANCE FOR COMMISSIONING, HANDING OVER ETC OF MAIN CIRCULATING WATER, CCW PIPING AND DRINKING WATER PIPELINES WITH FITTINGS, VALVES, SUPPORTS ETC

AT

2 X 125MW SURAT LIGNITE POWER PLANT (EXPANSION UNIT 3 & 4)
GUJARAT INDUSTRIES POWER COMPANY LIMITED
SURAT LIGNITE POWER PLANT, VILLAGE-NANI NAROLI
TAL- MANGROL, DIST - SURAT, GUJARAT

PART-I

TECHNICAL BID SPECIFICATION

AND

NOTICE INVITING TENDER, REVERSE AUCTION PROCEDURE & GCC

BHARAT HEAVY ELECTRICALS LIMITED
(*A GOVERNMENT OF INDIA UNDERTAKING*)
POWER SECTOR : WESTERN REGION
345-KINGSWAY: NAGPUR-440001

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LEGEND:

$: Attached at the end of hard copy of Tender Specifications Part-I. Hosted in BHEL web page (www.bhel.com) as file titled **"NIT+RA+GCC-522".**

@: Issued as separate hard copy booklet 'Tender Specifications Part-II (Price Bid)'. Hosted in BHEL web page (www.bhel.com) as files titled **"PRICE BID-522"**

Note:
Rest of the tender documents are included in Tender Specifications Part-I. Hosted in BHEL web page (www.bhel.com) as file titled "**TECH BID-522."**

BHARAT HEAVY ELECTRICALS LIMITED
(A GOVERNMENT OF INDIA UNDERTAKING)
POWER SECTOR - WESTERN REGION
SHREEMOHINI COMPLEX
345-KINGS WAY, NAGPUR-440001

No. BHE/PW/PUR/ SLT-CWP/522

COLLECTION OF MATERIALS FROM BHEL/CLIENT'S STORES/STORAGE YARD INCLUDING LOADING; TRANSPORTATION TO SITE; ERECTION, TESTING, ASSISTANCE FOR COMMISSIONING, HANDING OVER ETC OF MAIN CIRCULATING WATER, CCW PIPING AND DRINKING WATER PIPELINES WITH FITTINGS, VALVES, SUPPORTS ETC

AT

2 X 125MW SURAT LIGNITE POWER PLANT (EXPANSION UNIT 3 & 4)
GUJARAT INDUSTRIES POWER COMPANY LIMITED
SURAT LIGNITE POWER PLANT, VILLAGE-NANI NAROLI
TAL- MANGROL, DIST - SURAT, GUJARAT

EARNEST MONEY DEPOSIT : Please refer special conditions of contract (Section-15 of Part-I)

LAST DATE AND TIME FOR SUBMISSION OF OFFERS: Please refer web page (**WWW.BHEL.COM**) for latest updates.

THESE TENDER DOCUMENTS CONTAINING PART -I (TECHNICAL BID) AND PART- II (PRICE BID), ARE ISSUED TO:

M/S. ……

……..

(THESE TENDER DOCUMENTS ARE **NOT TRANSFERABLE** WITHOUT WRITTEN PERMISSION OF BHEL).

FOR BHARAT HEAVY ELECTRICALS LIMITED

DY. GEN MANAGER (PURCHASE)

PLACE: NAGPUR
DATE:

BHARAT HEAVY ELECTRICALS LIMITED
(A GOVERNMENT OF INDIA UNDERTAKING)
POWER SECTOR - WESTERN REGION
345-KINGSWAY, NAGPUR-440 001

PROCEDURE FOR SUBMISSION OF SEALED TENDERS

The bidder must submit their tenders as required in two parts in separate sealed covers prominently superscripted as **'Part-I Technical Bid'** and **'Part-II Price Bid'** and also indicating on each of the covers the tender specification number and due date & time as mentioned in the notice inviting tender.

PART-I (TECHNICAL BID) COVER-I

Excepting Rate Schedule, all other schedules, data sheets and details called for in the specification shall be enclosed in Part-I "Technical Bid" only.

PART-II (PRICE BID) COVER-II

All indications of price shall be given in this PART-II "PRICE BID". **EMD SHALL NOT BE INCLUDED IN THIS COVER.**

These two separate covers-I and II (Part-I and Part-II) shall together be kept in a third envelope (cover-III) along with requisite EMD as indicated earlier and this sealed cover shall be superscripted and submitted to Dy. General manager (purchase) at the above-mentioned address on or before the due date as indicated.

The qualified bidder will be intimated separately about the status of their offer.

Bidders are requested to make specific note of the following conditions:

- Contractor should have adequate resources including major T&P at his disposal for this job.
- Contractor should have sound financial stability.
- Bidder should meet quality requirement regarding workmanship, deployment of personnel, erection tools and necessary inspection, measurement & testing instruments.
- All information as called for in various appendices and clauses of tender specification should be furnished in completeness. Please refer the checklist.
- Clarification on tender specification if any shall be obtained by the bidder at least one week before submitting their offer.
- Offers must be submitted without any deviation.

- Offers received with any deviation or without relevant information as described above are liable to be rejected.

- Price bids received in the form other than specified in part-II (Price Bid) are liable to be rejected.

- Bidders shall enclose copies of relevant documents like work order, completion certificate etc in support of past experience of similar work in the last five years. Such documents shall be self-containing with regard to detailed scope of work, magnitude of job, resources in contractor's scope, time schedule etc.

- **Bidder shall note that their offer will be considered subject to the approval of BHEL's customer.**

PROJECT INFORMATION

1.00.00 BACKGROUND

Gujarat Industries Power Company Limited (GIPCL), as part of expansion plan is installing the two units each of 125 MW under "2x125 MW, expansion project (Phase II)-Unit-3 & 4" plan in their existing 2x125 MW phase-I premise at Surat Lignite Power Plant (SLPP), Nani Naroli, P.O. Nani Naroli-394110, Taluka-Mangrol, Dist.- Surat.

The site is located at a distance of approximately 28 kms from Kosamba, Village Nani Naroli, Taluk- Mangrol, District Surat, Gujarat.

The further informations are as given below:

1.0	CUSTOMER	:	Gujarat Industries Power Co. Ltd. P. O. Petrochemicals – 391 346 District Baroda, India
2.0	CONSULTANT	:	TCE Consulting Engineers Limited 73/1, St. Mark's Road Bangalore – 560 001.
3.0	PROJECT	:	Surat Lignite Power Plant 2 x 125 MW – Phase II (Expansion Project) Unit Nos. 3 & 4
4.0	LOCATION	:	At a distance of 28 kms from Kosamba, Village Nani Naroli, Taluk Mangrol, District Surat, Gujarat State, India.
5.0	NEAREST AIRPORT	:	Baroda, Gujarat State
6.0	ROAD APPROACH	:	Accessible by road from two points Kim and Kosamba which are on Mumbai-Ahmedabad highway. From Kim, the site is around 23 kms and from Kosamba, the site is around 28 kms.
7.0	NEAREST RAILWAY STATION	:	Kim/Kosamba is on Mumbai-Ahmedabad broad gauge line. Same is at a distance of 32 kms from the proposed power project site.
8.0	NEAREST PORT	:	Mumbai
9.0	ALTITUDE	:	About 50 m above mean sea level.

10.0	SEISMIC ZONE	:	Zone – III as per Indian Standard IS:1893 (Current Issue).
11.0	RAINFALL(ANNUAL TOTAL R.O.MEAN)	:	1800 mm (Maximum rainfall occurs during June to September)
12.0	AMBIENT AIR EMPERATURE		
	(a) Maximum dry bulb	:	45.6 Deg. C.
	(b) Minimum dry bulb	:	4.4 Deg. C.
	(c) Maximum daily average dry bulb	:	37.3 Deg. C
	(d) Reference Temperature for design of electrical equipment / devices	:	(+) 50 Deg. C
13.0	RELATIVE HUMIDITY		
	(a) Maximum	:	87%
	(b) Minimum	:	33%
	(c) Average	:	71%
	(d) Relative humidity for design of equipment / devices	:	(+) 100%
14.0	CLIMATIC CONDITION	:	Hot, humid and dusty.
15.0	WIND DATA		
15.1	(a) Wind load as per IS 875 (Part-3) 1987		
	(i) Basic wind speed	:	44 m/sec.
	(ii) Factor KI	:	1.07
	(iii) Terrain category 1 & the corresponding value of K2	:	1.09

Above information furnished are for general guidance of contractor. Contractor is advised to visit the site and appraise himself about the conditions of site and infrastructure available in the area for fulfilling their commitments under the contract.

Check List (Vide Para 1.3 Of Section-I of General Conditions Of Contract)				
1	Name of the Bidder with Postal Address for Correspondence			
2	Name of Contact Person with Telephone & Fax No.	Mr./Ms Tel No. Fax No.		
3	Nature of the firm	PROPRIETARY / PARTNERSHIP / LIMITED CO.		
4	Details of EMD Please Indicate whether 1) One Time EMD or, 2) Only for this Tender	DD No. …… DD Date…… Name of Bank……... Amount: Rs……		
5	Validity of Offer (BHEL's Requirement: 180 days from Due Date)	Validity _____ days		
6	Mobilization Time (Please refer Section-11 of SCC)	Mobilization Time _____		
7	Whether any conditions stipulated?	**Yes** (vide Document reference:	**No**	
		Bidder to note that tender with conditions unacceptable to BHEL shall be rejected.		
8	Bidder has visited the project site and acquainted with the site conditions		Yes	No
9	Details of concurrent jobs are furnished (**Appendix-VI**)		Yes	No
10	Headquarters organization is furnished		Yes	No
11	Proposed site organization is furnished		Yes	No
12	Names and particulars of directors/partners are furnished		Yes	No
13	Financial status of the firm (**Annexure 'A' of GCC**) is furnished		Yes	No
14	Profit & Loss Account for preceding three years is furnished		Yes	No

	Check List (Vide Para 1.3 Of Section-I of General Conditions Of Contract)		
15	Latest *Solvency Certificate* from *Govt. Authority* or **Certificate by Bidder's Banker for Overdraft & BG Limits** is Furnished (Certificate shall not be older than six months from the Last Date for offer submission)	Yes	No
16	Latest **Income Tax Clearance Certificate** or c**opy of IT Return along with copy of PAN Card** is Furnished	Yes	No
17	Manpower deployment plan (**Appendix – IV**) is furnished	Yes	No
18	Analysis of unit rates quoted (**Appendix-III**) is furnished	Yes	No
19	Month wise deployment plan for major T&P (**Appendix-II**) is furnished	Yes	No
20	Whether all the pages of the Tender Specification documents are read, understood and signed	Yes	No
21	Power of Attorney Enclosed in favour of Person Making Offer	Yes	No
22	Bidder has familiarized himself with all Relevant Local Laws & Local Conditions	Yes	No
23	Safety Requirement of this work in a Running plant Premises has been understood.	Yes	No
24	Erection and Commissioning programme furnished	Yes	No
25	Whether copies of detailed Work Orders (with BOQ) and Completion Certificates in support of above furnished	Yes	No
26	Whether contractor has left any job unfinished? If so, give reasons.	Yes	No
27	Whether any client has terminated the contractor's work before completion? If so, furnish reasons for the same	Yes	No

NOTE: STRIKE OFF **YES** OR **NO**, AS APPLICABLE

DATE: SIGNATURE OF BIDDER

DECLARATION BY BIDDER'S AUTHORIZED SIGNATORY

I, hereby certify that all the information and data furnished by me with regard to the tender specification no. BHE/PW/PUR/SLT-CWP/522 is true and complete to the best of my knowledge. I have gone through the specifications, conditions and stipulations in detail and agree to comply with the requirements and intent of the specification. I further certify that I am duly authorized representative of the under-mentioned bidder and a valid **power of attorney to this effect is also enclosed**.

Authorized representative's signature with

Name and address

Date:

Bidder's name and address

CERTIFICATE OF NO DEVIATION

TENDER SPECIFICATION NO. BHE/PW/PUR/SLT-CWP/522.

I/We, M/s
……
……

Hereby certify that notwithstanding any contrary indications / conditions elsewhere in our offer documents, I/we have neither set any terms and conditions nor there is any deviation taken from the conditions of BHEL's tender specifications, either technical or commercial, and I/we agree to all the terms and conditions mentioned in BHEL's tender specification with associated amendments, clarifications etc.

SIGNATURE OF THE BIDDER

DATE:

SECTION-3
OFFER OF THE BIDDER

To,
The DGM (Purchase)
Bharat Heavy Electricals Limited
Power Sector - Western Region
Shreemohini Complex
345, Kingsway
Nagpur 440 001

Dear Sir,

I/we hereby offer to carry out the work detailed in tender specification no. BHE/PW/PUR/SLT-CWP/522. issued by Bharat Heavy Electricals Limited, Power Sector-Western Region, Nagpur, in accordance with the terms and conditions thereof.

I/we have carefully perused the following documents connected with the above work and agree to abide by the same.

1. Instructions to bidders
2. General conditions of contract
3. Special conditions of contract
4. Other sections, appendices, schedules and drawings.

I/we have deposited/enclosed herewith the earnest money deposit (EMD) for a sum of Rs. 2, 00,000/- (Rupees two lakh only) details of EMD payment are furnished in the check list.

EMD shall be refunded should our offer not be accepted / **EMD need not be refunded and the amount may be treated as "One Time EMD" for erection and commissioning tenders of BHEL-PSWR, NAGPUR**. Should our offer be accepted, I/we further agree to deposit security deposit for the work as provided for in the tender specification within the stipulated time as may be indicated by BHEL, Power Sector-Western Region, and Nagpur.
I/we further agree to execute all the works referred to in the said documents upon the terms and conditions contained or referred to therein and as detailed in the appendices annexed thereto.

Place: Signature of bidder:
Date: Address:

Witnesses with their address

Signature	Name	Address
1.		
2.		

SECTION-4

SPECIAL CONDITIONS OF CONTRACT

4.1 SCOPE OF WORK

The scope of work, detailed more specifically herein below, is for the following systems

A) Main Circulating Water (CW) System completed with all associated valves, supports and other fittings, mountings etc.

B) Auxiliary Cooling Water (ACW) System complete with all associated valves, supports and other fittings, mountings etc.

C) CW Make up pipeline.

D) Any other pipeline contingent to completion of the aforesaid systems.

4.1.1 DETAILED SCOPE

1. Collection & loading of materials from BHEL's & client's stores/storage yard
2. Transportation to site of work including to pre-assembly yard and unloading
3. Pre-assembly, if any; pre-erection check of components
4. Loading, transportation from pre-assembly area to site of work & unloading
5. Erection, alignment, welding / bolting / fastening of pipes, butterfly valves, air release valves, and other valves, Duplex strainer, manhole doors, ladders etc.
6. Fabrication and erection of supports.
7. Non-destructive examination of joints welded at site
8. Hydraulic test of piping
9. Pre-commissioning checks / tests and assistance for commissioning
10. Handing Over

The work shall conform to dimensions and tolerances specified in the various drawings/ documents that will be provided during various stage of erection. If any portion of work is found to be defective in workmanship, not conforming to drawings or other stipulations due to contractor's fault, the contractor shall dismantle and re-do the work duly replacing the defective materials at his cost, failing which the work will be got done by engaging other agencies and recoveries will be effected from the contractor's bills towards expenditure incurred including departmental overheads of BHEL.

The scope of work is further detailed in the specifications hereinafter.

4.1.2 The intent of specification is to provide erection and commissioning services according to the most modern and proven techniques and codes. The omission of specific reference to any method, equipment or material necessary for proper and efficient erection and commissioning of the plant shall not relieve the contractor of the responsibility of providing such facilities to complete the work without any extra compensation.

4.1.3 The terminal points decided by BHEL shall be final and binding on the contractor for deciding the scope of work and effecting payment for the work done.

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

4.1.5 Contractor shall erect and commission all the equipments and auxiliaries as per the sequence & methodology prescribed by BHEL. The BHEL engineer depending upon the technical requirements, availability of materials and fronts, will decide this. No claims for extra payment from the contractor will be entertained on the ground of deviation from the methods adopted in erection of similar sets elsewhere.

4.1.6 The work covered under this specification is of highly sophisticated nature, requiring the best quality workmanship, engineering and construction management. The contractor should ensure successful and timely completion of the work. The contractor must deploy adequate quantity of tools, construction aids, equipment etc he must also deploy adequate trained, qualified and experienced supervisory staff and skilled personnel.

4.1.7 All necessary certificates and licenses, permits & clearances required to carry out this work are to be arranged by the contractor expeditiously at his cost.

4.1.8 All tools, tackles, fixtures, equipments, materials handling and transportation, manpower, supervisors/ engineers, consumables etc, required for this scope of work shall be provided by the contractor. These tools & plant, equipments, men & material shall remain at site throughout the duration of contract and extension thereof, if any. Diversion/removal of these shall be done only on the approval of BHEL. BHEL will be providing their T&P on sharing basis for erection and related activities at site as per details specified in Section-7.

4.1.9 During the course of erection, testing and commissioning certain rework/ modification/ rectification/ repair/ fabrication etc, will be necessary on account of feed back from various power station units already commissioned and/ or units under erection and commissioning and also on account of design discrepancies or manufacturing defects and site operation/ maintenance requirements. This will also include modifications/ re-works suggested by FES/ other inspection group (refer Section-8). Contractor shall carry out such rework/modification/ rectification/ fabrication/ repair etc, promptly and expeditiously. Daily log sheets signed by BHEL engineer and indicating the details of work carried out, man-hours etc shall be maintained by the contractor. Claim of contractor, if any for such works will be governed by clauses in Section-13.

4.1.10 All works such as cleaning, leveling, aligning, trial assembly, dismantling of certain equipments/ components for checking and cleaning, surface preparation, fabrication of sheets, tubes and pipes as per general engineering practice and as per BHEL engineer's instructions at site, cutting, weld depositing, grinding, straightening, chamfering, filing, chipping, drilling, reaming, scrapping, lapping, fitting up etc, as may be applicable in such erection works and which are treated incidental to the

erection works and necessary to complete the work satisfactorily, shall be carried out by the contractor as part of the work.

4.1.11 The contractor shall provide, excepting those specifically in BHEL scope, all fixtures, concrete block supports, wooden sleepers, steel structures required for jigs & fixtures, temporary supports, anchors for load and guide pulleys required for the work.

4.1.12 The contractor shall take delivery of the components, equipments, chemicals, lubricants etc from the BHEL/client's stores/storage area after getting the approval of BHEL engineer on standard requisition forms to be specified by BHEL. Complete and detailed account of the equipments erected as well as the progress shall be submitted to the BHEL engineer as directed.

4.1.13 Contractor shall plan and transport equipments, components from storage to erection site and erect them in such a manner and sequence that material accumulation at site does not lead to congestion at site of work. Materials shall be stacked neatly, preserved and stored in the contractor's shed and at work areas in an orderly manner. In case it is necessary to shift and re-stack the materials kept at work areas/ site to enable other agencies to carry out their work or for any other reason, contractor shall do it most expeditiously. No claim for extra payment for such work will be entertained.

4.2.0 PREPARATION OF FOUNDATIONS PITS ETC.

4.2.1 The dimensional accuracy, axes, elevation, levels etc, with reference to benchmarks of foundations and anchor bolt pits have to be checked and logged by the contractor before taking over the foundations. The contractor, as part of the work, should do adjustments of foundation level, dressing and chipping of foundation surfaces of all equipments as per BHEL engineer's instructions. Dressing and chipping of foundations to the extent of 25mm for achieving proper levels is within the scope of work.

4.2.2 All minor foundations and anchor points required for installing erection equipments and winches etc are in the scope of contractor

4.2.3 Welder's pit for in-situ welding of buried part of CW piping shall be made in the trench for CW Piping by the contractor as incidental to work.

4.3.0 WELDING, RADIOGRAPHY AND NDE

A) Installation of equipment involves good quality welding; NDE checks, etc contractor's personnel engaged should have adequate knowledge on the above works.

B) The method of welding (viz.) will be arc welding and details will be indicated in the drawing / documents. BHEL engineer will have the option of changing the method of welding as per site requirement. Welding of weld joints, including root, will have to be done with specified welding electrodes. The root welding has to be back gouged from inside the pipe by grinding

and welded. That is welding has to be done both from inside as well as from outside the pipes as per the relevant engineering document.

C) Welding of all attachments to piping shall be done only by the qualified and approved welders.

F) All the welders (structural and piping) shall be tested and approved by BHEL engineer before they are actually engaged on work though they may possess the IBR/other certificate. BHEL reserves the right to reject any welder without assigning any reason.

G) Welding electrodes have to be stored in enclosures having temperature and humidity control arrangement. This enclosure shall meet BHEL specifications.

H) Welding electrodes, prior to their use, call for baking for specified period and will have to be held at specified temperature for specified period. Also, during execution, the welding electrodes have to be carried in portable ovens.

I) Unsatisfactory and continuous poor performance may result in discontinuation of concerned welder.

J) The external welded surface shall be cleaned of slag, rust etc; ground finished to obtain smooth surface free of excess undulations, wrinkles etc and painted over a band width suitably covering the entire Heat Affected Zone for each site weld joint. Refer clause 4.8 hereinafter for further details.

K) The contractor shall maintain welding records in the form as prescribed by BHEL containing all necessary details, and submit the same to the BHEL engineer as required. Interpretation of BHEL engineer regarding acceptability of the welds shall be final.

L) NDE (radiography & LPI/DPT) shall be done as per approved field quality plan/ other BHEL documents.

M) 100% radiography may have to be taken in respect of certain in-situ weld joints.

N) Contractor shall make complete arrangement for radiography test of welds connected with this work. It may be noted that invariably the radiography work will be carried out only after the close of other site activities.

O) Radiography inspection of welds shall be performed in accordance with requirements and recommendation of BHEL engineer. The quantum of radiographic inspection shall be as per provision of BHEL's erection documents/ FQP. They may, however be increased depending upon the performance of the individual welder at the discretion of BHEL engineer.

P) All radiography films and records of weld joints shall be preserved properly and be handed over to BHEL. These shall become the property of BHEL.

Q) **For the radiography test of weld joints cleared and accepted by BHEL/client, payment @ Rs.10 per centimeter of accepted film length (of standard width applicable for these joints)**. No payment shall be made for film lengths not accepted by BHEL and reasons for which are attributable to the contractor such as retakes on account of bad shot, poor joint quality etc. Please refer section-12 special conditions of contract (Terms of Payment) for release of payment.

4.4.0 **GENERAL RESPONSIBILITY OF THE CONTRACTOR**

4.4.1 The contractor shall have total responsibility for all equipments and materials in his custody at his stores, loose, semi-assembled, assembled or erected by him at site. He shall effectively protect the finished works from action of weather and from damages or defacement and shall also cover the finished parts immediately on completion of work as per BHEL engineer's instructions. The machine surfaces/ finished surfaces should be greased and covered.

4.4.2 **PRESERVATION & PROTECTION OF COMPONENTS**

At all stages of work, equipments/materials in the custody of contractor, including those erected, will have to be preserved as per the instructions of BHEL.

4.4.3 The contractor shall make suitable security arrangements including employment of security personnel and ensure protection of all materials/equipment in their custody and installed equipments from theft/fire/pilferage and any other damages and losses.

4.4.4 Contractor shall collect all scrap materials periodically from various area of work site and pre- assembly area, deposit the same at the place earmarked at site or shift the same to a place earmarked in BHEL / client's stores. In case of failure of contractor in compliance of this requirement, BHEL will make suitable arrangement at contractor's risk and cost.

4.4.5 The entire surplus, damaged, scrap, unused materials, package materials / boxes / containers, special transporting frames, gunny bags, etc, shall be returned to BHEL stores by the contractor with proper records.

4.4.6 The contractor shall not waste any materials issued to him. In case it is observed at any stage that the wastage/excess utilization of materials is not within the permissible limits, recovery for the excess quantity used or wasted will be affected with departmental charges from the contractor. Decision of BHEL on this will be final and binding on the contractor.

4.4.7 For any class of work for which no specifications have been laid down in these specifications, work shall be executed as per the instructions of BHEL.

4.5.0 **ERECTION OF CW PIPING**

The detail of equipments to be erected under this contract is generally as per the indicative weight given in APPEXDIX-I These details are approximate and meant only to give a general idea to the bidder about the magnitude of the work involved, actual quantum and type of equipments will be based on the erection documents, which will be furnished in the course of erection. The piping will run in excavated trenches underground as well as over the ground and will be encased in concrete as per relevant drawings. Excavation of trenches, construction of ducts, concrete encasing of piping are not in the scope of work.

On condenser end, Main CW supply pipe from & including RE Joint to condenser and return piping from condenser to and including R.E. Joints is included in the scope of other erection agency. Accordingly, these works are excluded from scope of this specification. Work under this specification includes Main CW supply piping from CW PH terminal point to RE joints at condenser inlet and the return line from RE joints at condenser outlet to CW PH/ Cooling Tower as per the drawings/ documents.

On CW Pump house end for CW supply line the work beyond CW pump discharge terminal point is in the scope.

However, connection to the above terminal points including edge preparation, fit-up, welding applicable NDE etc are in the scope of work.

4.5.1 Tubes/pipes sent in standard length shall be cut to suit the site conditions and the layouts. Tubes or pipes wherever deem convenient will be sent in running lengths. Bends of tubes up to O.D. 65 mm will have to be fabricated at site as incidental to the work.

4.5.2 Welding of all attachments on piping is included is in the scope of work.

4.5.3 The work on piping systems include laying, edge preparation, fixing & welding/ bolting of the elbows/fittings/valves of all types and sizes/ strainers (e.g. duplex strainers etc)/ filter and any other equipment shown in the drawing/documents etc coming in the pipelines, fixing & adjustment of supports/angles shock absorbers and carrying out all other activities/work to complete the erection and also carrying out all pre-commissioning/commissioning operations mentioned in the specification as per BHEL engineers instructions and/or as per approved drawings/documents.

4.5.4 Fittings like bends tees, elbows, miter bends, reducers, flanges etc, will be supplied as loose items.

4.5.5 Certain adjustments in length may be necessary while erecting pipelines. The contractor should remove the extra lengths/add extra lengths to suit the final layout after preparing edges afresh at no extra cost.

4.5.6 Minor adjustment like removal of ovality in pipes is in the scope of work.

4.5.7 All drains / vents / relief tubes / escape pipes / air relief valves/ safety valve/ piping to various tanks / sewage / drain canal / flash box / sump / atmosphere etc from the piping and equipments erected by the contractor is completely covered in the scope of work.

4.5.8 Connection (either flanged/bolted or welded) of piping to the terminal points/ equipments etc is in the scope of work even though such terminal point/ equipment may not form part of this work. All NDE including radiography of joints so made, is also within the scope of work/specification.

4.5.9 Hydraulic test of piping assembly shall be conducted after completion of certain number of weld joints as instructed by BHEL. Supply of suitable blanks/ dished ends, welding/ bolting the same, removal of blanks and fresh edge preparation/ restoration of pipeline after successful completion of hydraulic test is to be carried as part of the work. No separate payment shall be made for this work

4.5.10 Manhole door openings have to be cut on the main piping and necessary attachments such as access pipe, flange, pad plates etc is in the scope of work. The access pipe may have to be suitably cut in length and in profile to suit the requirement. Blind/blank flanges have to be bolted later on to close the access opening. Materials, fasteners etc for these permanent installations will be provided by BHEL free of charge.

4.5.11 **De-watering of pits and shuttering to avoid land-slide:**

De-watering of pits excavated by the respective agency has to be done periodically to ensure safe and proper working condition. Similarly, contractor shall arrange shuttering with props of side walls to avoid land slide in the pit wherever required for work.

4.6 **OTHER IMPORTANT POINTS**

4.6.1 Suspensions/supports for tubes/piping will be supplied in running/random lengths/ sizes, which shall be fabricated as per drawing and erected as required. Similarly ladders for approaching manhole doors shall also be fabricated from random sized materials provided by BHEL as free issue.

4.6.2 Layout of small-bore piping shall be done as per site requirement. Necessary sketch for routing these lines should be prepared by the contractor and got approved from BHEL. There is a possibility of slight change in routing the above pipelines even after completion of erection; contractor's scope includes such re-routing within the quoted rates.

4.6.3 Welding of necessary instrumentation tapping points, root valves, flow metering & measurement devices, and control valves to be provided on pipe lines covered within the scope of this specification, will also be the responsibility of the contractor and will be done as per the instructions of BHEL site engineer. It may be necessary to cut and remove parts of already erected pipeline for introducing such items. All necessary activities like edge preparation, fit-up, welding, NDE etc. For installation/introduction of all the above items will be contractor's responsibility even if the:

i) Items are not specifically indicated under the respective product groups as given in the technical specifications.

II) Items are supplied by an agency other than BHEL.

NDE for above shall be done as per the specifications as part of work.

4.6.4 Actuators/drives of valves, gates, etc may have to be serviced, lubricated, before erection, during pre-commissioning & commissioning, including carrying out minor adjustments required as incidental to the work.

4.6.5 All electrical motors have to be tested for IR & PI values prior to the trial run. Where required, dry out may have to be carried out by using external heating source. Contractor shall make all arrangements in this regard and complete the work as instructed. Contractor shall provide the requisite Meggar for this purpose.

4.7.0 TESTING, PRE-COMMISSIONING AND ASSISTANCE FOR COMMISSIONING

4.7.1 Hydraulic testing of the piping shall be conducted in segments after laying.

4.7.2 Testing, pre-commissioning, & commissioning will involve, flushing of the lines by water as informed by BHEL from time to time shall be completed.

4.7.3 All the tests should be repeated till all the equipments satisfy the requirement/ obligations of BHEL to their client and also the relevant statutory authority.

4.7.4 Contractor shall lay/install necessary temporary piping, pumps, valves, gauges, cables, switches etc, for conduct of hydraulic test, this may involve cutting of some portion of existing piping/valves, placing of rubber wedges / blanks in the valves and other openings where required, bends have to be fabricated at site from running length of pipe. Temporary installation itself has to be tested, tried, and subject to non-destructive examinations as per the instructions of BHEL as part of work.

4.7.5 Contractor shall arrange all the materials, equipments such as pumps with drive motors, starters, cables & switches etc, pipes and fittings, valves, and supports, pressure gauges etc for water filling, pressure testing and de-watering of pipes and pits.

4.7.6 **Providing blanking plates, dished ends, fabrication, fit-up, welding, of requisite blanks for conduct of hydraulic test is part of work. Contractor shall arrange dished ends – at least 2 sets for each size of pipes suitably**. Removal of blanks and restoration of the concerned system/line is to be done as part of work. No separate payment will be made for these activities.

4.7.7 Overhauling, cleaning, servicing of valves, during erection and commissioning stages are in the scope of work.

4.7.8 During pre-commissioning / commissioning, a replacing / changing mechanical/ other seal of equipments is within the scope of work.

4.7.9 In case any defect is noticed during tests, trial runs such as loose components, undue noise or vibration, strain on connected equipment etc, the contractor shall immediately attend to these defects and take necessary corrective measures. If any readjustment and realignment are

necessary, the same shall be done as per BHEL engineer's instructions. Claim, if any, for these works from the contractor shall be governed by Section-13.

4.7.10 Contractor shall cut/open work, if needed, as per BHEL engineer's instructions during commissioning for inspection, checking and make good the works after inspection is over.

Similarly, during the course of erection, if certain portion of equipment's erected by the contractor has to be undone for enabling other contractors/agencies of BHEL/customer to carry out their work, contractor shall carry out such jobs expeditiously and promptly and make good the job after completion of work by other contractor's/ agencies of BHEL/customer as per BHEL engineer's/agencies of BHEL/customers instructions. Claims, if any, in this regard shall be governed as per Section-13.

4.7.11 During this period, though BHEL/ client's staff will also be associated in the work, the contractor's responsibility will be to arrange for complete requirement of men and required tools and plants, consumables, scaffolding and approaches etc, till such time the commissioned unit is taken over by BHEL's client.

4.7.12 It shall be specifically noted that the contractor may have to work round the clock during the pre-commissioning and commissioning period along with BHEL engineers and hence considerable overtime payment is involved. The contractor's quoted rates shall be inclusive of all these factors.

4.7.13 The contractor shall carry out any other tests as desired by BHEL engineer on erected equipment covered under the scope of this contract during testing, pre-commissioning and commissioning, to demonstrate the completion of any part or whole of work performed by the contractor.

4.8 CONCRETING / PROTECTION -PIPES:

4.8.1 **INTERNAL SURFACE (FOR PIPES DIA ABOVE 1000 mm)**

BHEL will supply pipes with internal surfaces cement concrete coated (15mm thickness) / or the pipes will be coated with cement concrete at site by the civil agency, except a band of approx 150 mm at each end of the straight pipes, where site welding is to be done with next pipe after alignment. After the weld joint completion at site, these areas have to be cleaned thoroughly by mechanical wire brushing, and handed over to the civil contractor for completing the concreting at welded joints. Proper co ordination is required with the civil contractor for the concreting work. Contractor shall supply all required items and consumables etc **(conforming to BHEL standards as specified in the next table)** for this activity excluding concreting. There will be no separate payment for this and the activity shall be done as part of work.

4.8.2 **EXTERNAL SURFACE OVERGROUND PIPING**

The pipes will be supplied red-oxide coated for protection both outside and inside. The pipes will have to be cleaned, coated as specified in the next table. This shall be done as incidental to work and not to be paid for separately. Primers, paints and all consumables etc (**conforming to BHEL standards as specified in the next table**) is in contractor's scope.

4.8.3 **EXTERNAL SURFACE – CW PIPE ENCASED IN CONCRETE**

The pipes will be supplied red-oxide coated for protection both outside and inside The area where the primer coating has got damaged during various stages of handling and erection and also the area adjoining site weld joints, shall be, as incidental to work, applied with coating as specified in the next table. This will not be paid for separately. Contractor shall provide the primer and other consumables (**conforming to BHEL standards as specified in the next table**) etc for this application. After that the encased concreting will be done by civil agency.

4.9 All the specifications detailed herein above shall be applicable, mutatis-mutandis, to all the piping covered under this scope of work.

Table 1

S No	PGMA Description	Surface Preparation &Surface Profile	Primer Coat		Intermediate Coat		Finish Coat		Total DFT microns minimum
			Paint	No of Coat	Paint	No of Coat	Paint	No of Coat	
1	CW BURIED PIPING DIAMETER>1000mm a) External Surface	SSPC-SP3 Power Tool Cleaning	ROZP IS12744 DFT 30µ	1			** refer Note below		**
	b) Internal Surface	Blast Clean to Sa 2 1/2	Coal Tar Primer DFT 50 µ	1			Coal tar Epoxy DFT 80µ	1	130
2	**CW OVER GROUND PIPING DIAMETER> 1000mm**	Blast Clean to Sa 2 1/2	Epoxy Polyamide resin-based ROZP DFT 30µ	2	high build resin-based MIO paint DFT 100 µ	1	# Epoxy Polyamide Enamel DFT 40 µ	2	160+80#
3	**CW OVER GROUND PIPING DIAMETER< 1000mm** External surface (Boiler Aux Cooling Water)	Blast Clean to Sa 2 1/2	Epoxy Polyamide resin-based ROZP DFT 30µ	2	high build resin-based MIO paint DFT 100 µ	1	# Epoxy Polyamide Enamel DFT 40 µ	2	160+80#

Note:

1. ROZP: Red Oxide Zinc Phosphate Paint 2. #: Painting at site by BHEL_ PSWR 3. µ= micron

4. **: Coal tar primer, coal tar enamel inner wrap of fiber glass, final outer warp of enamel impregnated fiber glass. Total thickness of coating shall not be less than 4.0 mm or with anticorrosive tape of 4.0 mm thick confronting to IS 10220 and AWWA C 203-93. This will be done at site by BHEL-PSWR.

SECTION-5

SPECIAL CONDITIONS OF CONTRACT

5.0 OBLIGATIONS OF THE CONTRACTOR (TOOLS, TACKLES, CONSUMABLES, INFRASTRUCTURES, ETC)

5.1 ACCOMMODATION, DRINKING WATER & LOCAL TRANSPORTATION FOR THE LABOUR OTHER EMPLOYEES

No space/land for labour colony will be provided by BHEL/customer. Contractor shall make his own arrangements for accommodation with necessary facilities such as drinking water, sanitation and lighting/Electricity etc for his workmen and the staff. Also, the contractor has to make his own arrangement for transportation of his workmen and other employees. BHEL/client shall not provide any facility in this regard.

5.2 TOOLS AND TACKLES, MEASURING AND MONITORING DEVICES:

5.2.1
The contractor shall provide all (excepting those indicated in BHEL scope) required tools and plants, monitoring and measuring devices (MMD) and handling & transportation equipments for the scope of work covered under these specifications. Contractor has to provide suitable cranes for material handling at BHEL/Client's stores/storage yard. BHEL's crane will not be available for this purpose. Please refer relevant appendix for the list of T&P being provided by BHEL free of charges on sharing basis. Further, contractor shall provide the blanks/ dished ends suitable for all sizes of pipes (as per Drgs supplied by BHEL) involved in this work for conduct of hydraulic test of pipelines.

5.2.2
All tools and tackles to be deployed by the contractor for the work shall have the prior approval of BHEL engineer with regard to brand, quality and specification. Indicative list of major T&P to be arranged by the contractor has been furnished in relevant appendix. Contractor shall also mobilize all other T&P necessary for timely and satisfactory completion of the work in scope.

5.2.3
Contractor's responsibilities with regard to operator, fuel, lubricants and daily upkeep of T&P provided by BHEL is further detailed in section-7 and appendix detailing BHEL's T & P to be provided for this work.

5.2.4
Timely deployment of adequate quantity of T&P is the responsibility of the contractor. The contractor shall be prepared to augment the T & P at short notice to match the planned programme and to achieve the milestones.

5.2.5
Contractor shall maintain and operate his tools and plants in such a way that major breakdowns are avoided. In the event of major breakdown, contractor shall make alternative arrangements expeditiously so that the progress of work is not hampered.

5.2.6
In the event of contractor failing to arrange the required tools, plants, machinery, equipment, material or non-availability of the same owing to breakdown, BHEL will make the alternative arrangement at the risk and cost of the contractor including BHEL's departmental overhead @ 30%.

5.2.7
The T&P to be arranged by the contractor shall be in proper working condition and their operation shall not lead to unsafe condition. The movements of cranes and other equipment should be such that no damage / breakage occur to foundations, other equipments, material, property and men. All arrangements for the movement of the T&P etc shall be the contractor's responsibility. Contractor shall submit the necessary test certificates for equipments.

5.2.8
Use of welding generators/ rectifiers for welding only shall be permitted. Use of welding transformers will be subject to specific approval of BHEL engineer.

5.2.9
The contractor at his cost shall carry out periodical testing of his construction equipments and calibration of measuring & monitoring devices (MMD). Test/ calibration certificates shall be furnished to BHEL. MMD shall be calibrated only at accredited laboratory as per the list available with BHEL or any other laboratory approved by BHEL.

5.2.10
BHEL T&P will be issued in basic assembled condition; contractor shall transport these T&P to & fro between BHEL stores and site. Additional loose components / sub-assemblies / attachments as and when necessary, will be issued by BHEL, to & fro between BHEL stores and site of such items shall also be done by the contractor. Assembly of such additional loose components/sub-assemblies/ attachments is in contractor's scope. Any boom reduction/ extension of BHEL cranes for contractor's use and restoration to previous state or as directed by BHEL shall be the contractor's responsibility. Contractor shall provide all enabling services with tools and tackles for assembly/dismantling and boom extension/reduction as above.

5.2.11
Contractor shall provide fuel or bear the cost as decided by BHEL for the crane(s) for his use (in respect of both BHEL owned as well as hired crane).

5.3 **CONSUMABLES**

5.3.1
The contractor shall provide all consumables required for carrying out the work covered under these specifications excepting those specifically indicated as BHEL scope.

5.3.2
All consumables to be used for the work shall have prior approval of BHEL engineer with regard to brand and quality specifications. Test reports / certificates

in respect of these consumables, wherever applicable, shall be submitted to BHEL engineer.

5.3.3 **PRIMERS & PAINTS**

All primers and paints required for this contractual work are in the contractor's scope.

5.3.4 Consumables for BHEL supplied equipments (cranes, T &P etc)

Refer relevant clause of section-7 special conditions of contract in this regard.

5.3.5 Welding electrodes, filler wires for TIG welding and gases .

5.4.1
All the required welding electrodes, except those indicated as BHEL scope elsewhere in these specifications, as approved by BHEL shall be arranged by contractor at his cost. It shall be the responsibility of the contractor to obtain prior approval of BHEL, before procurement, regarding manufacturer, type of electrodes etc. On receipt of the electrodes at site, it shall be subject to inspection and approval by BHEL regarding type of electrodes, batch number, date of expiry etc. Batch test certificates shall be made available for verification & record before the actual use of the welding consumables.

BHEL reserves the right to reject the use of any electrodes, if found non-acceptable because of bad quality, deterioration in quality due to improper storage, shelf life expiry, unapproved type / brand etc.

5.4.2
Filler wires, for TIG welding of piping, to the extent supplied by the manufacturing units of BHEL along with the components / equipments only shall be provided by BHEL as free issue. Contractor shall at his cost meet requirements of TIG filler wires, if any, beyond this free issue by BHEL.

5.4.3
Gases like argon, oxygen, acetylene etc that are required for erection related activities shall be arranged by the contractor at his cost.

5.5 **FIELD OFFICE**

5.5.1
The contractor shall make his own arrangements for field office and stores for accommodating necessary equipments, tools room for execution of the work. Only open space will be provided by BHEL customer free of charges as per the availability of space.

5.5.2
On completion of work, all the temporary buildings, structures, pipelines, 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, the same will be arranged to be removed and expenditure thereof will be recovered from the

contractor. The decision of BHEL engineer in this regard shall be final. However, the scope of dismantling and leveling the area is limited only to the contractor's site office, yard and other spaces occupied by the contractor.

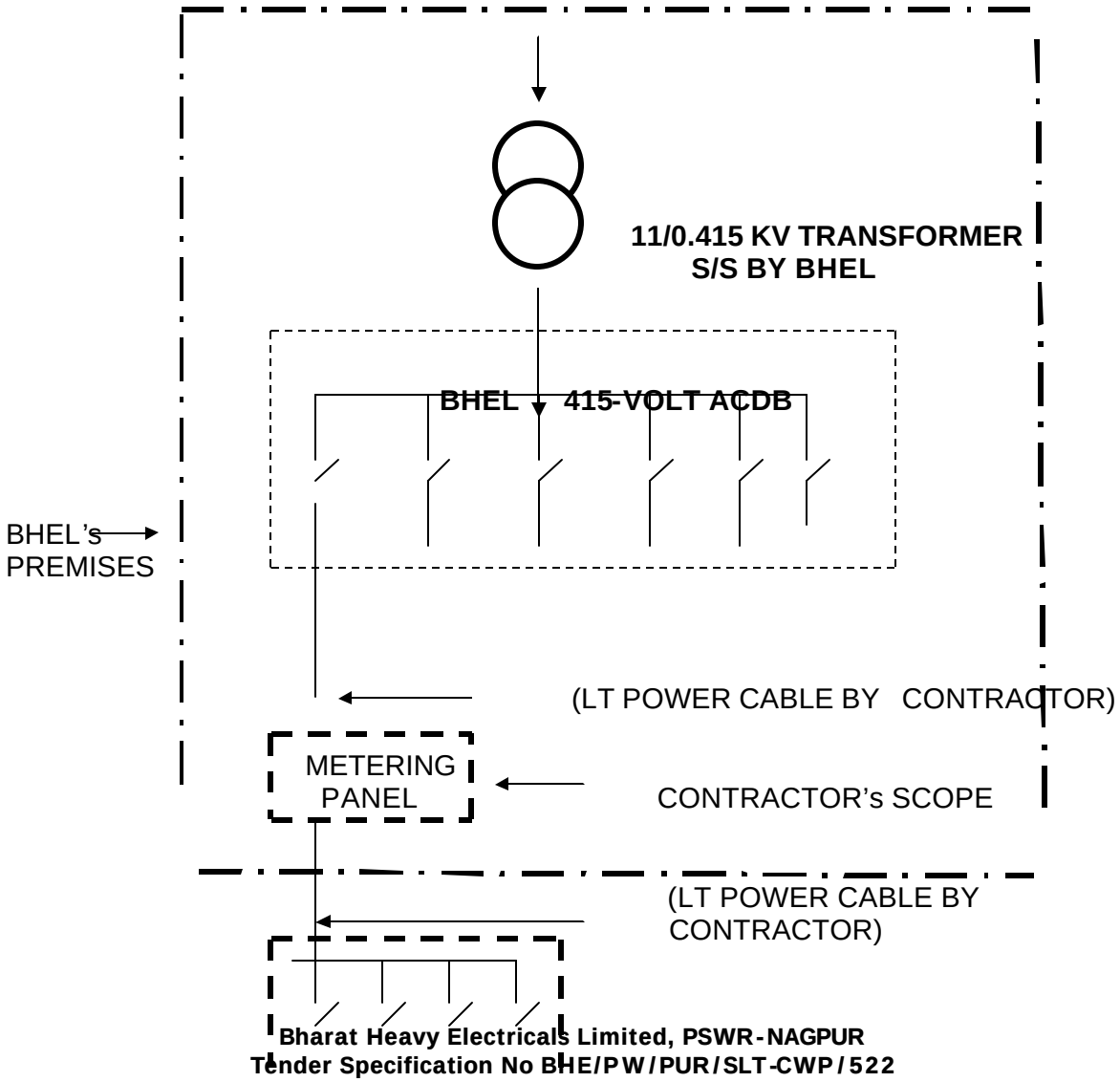
5.6 AREA LIGHTING

5.6.1
Contractor shall arrange adequate floodlights, hand lamps and area lighting. Contractor shall use his own materials like cables, fuses, switch-boards etc. BHEL/client will not provide anything in this regard.

5.7 CONSTRUCTION POWER & WATER

5.7.1
BHEL shall provide 3-phases, 415 volts construction power on chargeable basis at one single point located at a radial distance of 500 meters from transformer sub-station. Contractor shall make necessary arrangement for tapping the power from sub station board at his cost as per the below mentioned **sketch**.

SINGLE LINE DIAGRAM FOR 11/0.415 KV CONSTRUCTION POWER DISTRIBUTION (A TYPICAL ARRANGEMENT)



5.7.1.1

Contractor shall install metering panel suitable for out door installation with locking arrangement within the premises of BHEL Transformer sub-station. Metering panel should have provision of bus bars (3 Phase & Neutral), Energy Meter C.T. operated for metering the power consumption for three-phase four wires system. The CT ratio 400/ 1 or 5 Amps preferably meter should be of M/s L&T make digital energy meter type ER-300P, CTR 400/5 Amps, 3 Phase, 4 wire connection. Further contractor, shall abide for the following obligation at his cost:

- Contractor shall carry out necessary cabling from BHEL's ACDB to metering panel & from metering panel to contractor's ACDB which is to be installed near to their load Center.
- Contractor shall install the power factor improvement devices in their ACDB for improvement of power factor in order to achieve the system stability in distribution network.
- Once the contractor's feeder is charged, only authorized person shall be allowed to access the metering panel with due permission of BHEL's engineer.
- In case energy meter installed by contractor become defective due to unforeseen reasons, it shall be brought to the notice of BHEL site engineer and shall arrange its immediate replacement. the recovery of the power consumed, for the period/ duration of the outage of meter, shall on the basis of past average consumption and shall be binding on contractor as per decision/discretion of BHEL engineer at site.

5.7.1.2

Contractor shall submit daily power consumption report in prescribed format; however meter reading shall be jointly recorded for monthly power consumption from first day to last day of month or as per billing duration as prescribed by GIPCL. **Energy consumption shall be recovered from the monthly running bills as per meter reading jointly recorded at rates charged by Customer; p**resent rate is Rs 12.50 per unit (KWH) of power consumption**.**

5.7.1.3

Contractor shall ensure compliance of statutory requirement for his electrical installations and construction power flow shall be permitted only after submission of test report/certificate by contractor from authorized authorities for installation as per the requirement of statutory authority. The all expenses towards the certification of installation shall be borne by contractor.

5.7.1.4

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

5.7.1.5

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

5.7.2 Construction & Drinking Water

5.7.2.1

The contractor shall make his own arrangements for tapping off Construction water & testing water from available single point as provided by customer. However in case of inadequate supply / non-availability of construction water from customer, contractor shall have to arrange construction water himself at his own expenses.

Contractor shall collect drinking water from sources/tapping point as provided by customer by making his own arrangement.

5.7.2.2

Contractor shall be well equipped with back-up power supply arrangement like dg set and diesel operated welding machine etc. To tackle situations arising due to failure of customer supplied power, so as to ensure continuity and completion of critical processes that are underway at the time of power failure or important activities planned in immediate future.

5.7.2.3

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

5.8 Responsibilities with regard to labour employment etc.

Refer clause 2.8 of general conditions of contract also in this regard.

5.8.1

Contractor shall also comply with the requirements of local authorities/ project authorities calling for police verification of antecedents of the workmen, staff etc.

5.8.2

The contractor in the event of his engaging 10 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.

5.8.3

Contractor will deduct the necessary amount from his employees towards provident fund and contribute equal amount as per government of India labour laws regularly, will deposit this amount to the provident fund commissioner and get the account code. Contractor shall submit the account code duly certified by PF commissioner to BHEL project in-charge.

5.8.4

Contractor shall also comply with the provisions of ESIS act in vogue and submit evidence thereof to BHEL site in-charge. Also all other employees' benefits to be borne by the contractor as per the labour laws. Contractor shall produce necessary certificates towards their compliance with such statutes and payment of all statutory dues.

5.8.5
Contractor shall also comply with the requirements of local authorities/ project authorities calling for police verification of antecedents of the workmen, staff etc.

5.8.6
Where applicable, provisions of workman compensation act shall be adhered too.

5.8.7
BHEL / customer may insist for witnessing the regular payment to the labour. They may also like to verify the relevant records for compliance with statutory requirements. Contractor shall enable such facilities to BHEL / customer.

5.8.8
It is the responsibility of the contractor to arrange gate pass for all his employees, T&P etc for entering the project premises. Necessary coordination with customer officials is the responsibility of the contractor. Contractor to follow all the procedures laid down by the customer for making gate passes. Where permitted, by customer / BHEL, to work beyond normal working hours, the contractor shall arrange necessary work permits for working beyond normal working hours.

5.9
If at any time during the execution of work, it is noticed that the work is suffering on account of non-availability/shortfall in provision of resources from the contractor's side, BHEL will make suitable alternate arrangements at the risk and cost of contractor. The expenditure incurred with overheads thereon shall be recovered from the c ontractor.

TAXES, DUTIES, LEVIES

5.10

Refer to Clause 2.8.4 of General Conditions of Contract. Notwithstanding anything

Contained therein, the following provisions shall be applicable for this contract.

5.10.1

The contractor shall pay all (save the specific exclusions as enumerated in this contract) taxes, fees, license charges, deposits, duties, tools, royalty, commissions or other charges which may be levied on the input goods & services consumed and output services delivered in course of his operations in executing the contract. In case BHEL is forced to pay any of such taxes, BHEL shall have the right to recover the same from his bills or otherwise as deemed fit.

5.10.2 Service Tax & Cess on Service Tax

Service Tax and Cess on Service Tax as applicable on output Services are excluded from contractor's scope; therefore contractor's price/rates shall be **exclusive** of Service Tax and Cess on Output Services. In case, it becomes mandatory for the contractor under provisions of rele vant act/law to collect the Service Tax & Cess from BHEL and deposit the same with the concerned tax authorities, such applicable amount will be paid by BHEL. Contractor shall submit to BHEL documentary evidence of Service Tax registration and remittance record of such tax immediately after depositing the tax with concerned authorities. Contractor

shall obtain prior written consent from BHEL before billing the amount towards such taxes.

With introduction of Cenvat Credit Rules 2004, which came into force w.e.f. 10.09.2004, Excise Duty paid on Input Goods including Capital Goods and Service Tax paid on Input Services that are used for providing the output services can be taken credit of against the Service Tax payable on output services. However BHEL may opt for availing the abatement provision in which case cenvat credit may not be available on input duty.

5.10.3 VAT/WCT

As regards Sales Tax on transfer of property in goods involved in Works Contract applicable as per local laws, the price quoted by the contractor shall be **exclusive** of the same. Where such taxes are required to be paid by the contractor, this will be reimbursed on production of proof of payment made to the authorities by the Contractor. In any case the Contractor shall register himself with the respective Sales Tax authorities of the state and submit proof of such registration to BHEL along with the first RA bill. The contractor has to take all necessary steps to **minimize tax on input goods** by purchasing the materials from any registered dealer of the concerned state only. In case contractor opts for composition, it will be with the prior express consent of BHEL. Deduction of tax at source shall be made as per the provisions of law unless otherwise found exempted. In case tax is deducted at source as per the provisions of law, this is to be construed as an advance tax paid by the contractor and no reimbursement thereof will be made unless specifically agreed to.

5.10.4 Modalities of Tax Incidence on BHEL

Wherever the relevant tax laws permit more than one option or methodology for discharging the liability of tax/levy/duty, BHEL will have the right to adopt the appropriate one considering the amount of tax liability on BHEL/Client as well as procedural simplicity with regard to assessment of the liability. The option chosen by BHEL shall be binding on the Contractor for discharging the obligation of BHEL in respect of the tax liability to the Contractor.

5.10.5 New Taxes/Levies

In case the Government imposes any new levy/tax on the output service/ goods/work after award of the contract, the same shall be reimbursed by BHEL at actual.

In case any new tax/levy/duty etc. becomes applicable after the date of Bidder's offer, the Bidder/Contractor must convey its impact on his price duly substantiated by documentary evidence in support of the same **before opening of Price Bid**. Claim for any such impact after opening the Price Bid will not be considered by BHEL for reimbursement of tax or reassessment of offer.

No reimbursement/recovery on account of increase/reduction in the rate of taxes, levies, duties etc. on input goods/services/work shall be made. Such impact shall be taken care of by the Price Variation/Adjustment Clause (PVC) if any. In case PVC is not applicable for the contract, Bidder has to make his own assessment of the impact of future variation if any, in rates of taxes/duties/ levies etc. in his price bid.

SECTION-6

SPECIAL CONDITIONS OF CONTRACT

6.0 CONTRACTOR'S OBLIGATION IN REGARD TO EMPLOYMENT OF SUPERVISORY STAFF AND WORKMEN

6.1
The contractor shall deploy all the skilled/semiskilled/unskilled labour including highly skilled workmen like high-pressure welders etc these workmen should have previous experience on similar job. They shall hold valid certificates wherever necessary. BHEL reserves the right to insist on removal of any employee of the contractor at any time if he is found to be unsuitable and the contractor shall forthwith remove him. Manpower as required vides APPENDIX-IV. Also the actual deployment will be so as to satisfy the erection and commissioning targets set by BHEL.

6.2
It is the responsibility of the contractor to engage his workmen in shifts and or on overtime basis for achieving the targets set by BHEL. This target may be set to suit BHEL's commitments to its customer or to advance date of completion of events or due to other reasons. The decision of BHEL in regard to setting the erection and commissioning targets will be final and binding on the contractor.

6.3
Contractor shall deploy only qualified and experienced engineers/ supervisors. They shall have professional approach in executing the work.

6.4
The contractor's supervisory staff shall execute the work in the most professional manner in the stipulated time. Accuracy of work and aesthetic finish are essential part of this contract. They shall be responsible to ensure that the assembly and workmanship conform to dimensions and tolerances given in the drawings/instructions given by BHEL engineer from time to time.

6.5
The supervisory staff employed by the contractor shall ensure proper outturn of work and discipline on the part of the labour put on the job by the contractor. Also in general they should see that the works are carried out in a safe and proper manner and in coordination with other labour and staff employed directly by BHEL or other contractors of BHEL /customer.

6.6 INDUSTRIAL RELATIONS AND LABOUR LAWS

An industrial relations supervisor shall coordinate for the implementation of local labour laws, maintenance of records as required by contract labour (regulation and abolition) act and also coordinate with the local labour authorities and any other such authorities under whom this work falls.

6.7

If at any time, it is found that the contractor is not in a position to deploy the required engineers/supervisors/workmen due to any reason; BHEL shall have the option to make alternate arrangements at the contractor's risk and cost.

6.8 **SITE ORGANIZATION**

The contractor shall provide adequate staffing in the following areas.

1. Overall planning, monitoring & control
2. Piping
3. Welding & NDE
4. Quality control and quality assurance
5. Materials management
6. Safety, fire & security
7. Industrial relations and fulfillment of labour laws and other statutory obligations.

Contractor shall furnish an organization chart indicating the staffing pattern for the above functions. Contractor shall provide the names and details of engineer/supervisors at the time of mobilization to BHEL as per the proposed organization chart.

SECTION-7

SPECIAL CONDITIONS OF CONTRACT

7.0 **OBLIGATIONS OF BHEL**

7.1 FACILITIES PROVIDED BY BHEL

7.1.1 **SPACE FOR SITE OFFICE/STORES**

REFER SECTION-5 IN THIS REGARD.

7.1.2 **CONSTRUCTION POWER & WATER**

REFER SECTION-5 IN THIS REGARD.

7.1.3 **OTHER MATERIALS AND CONSUMABLES:**

BHEL shall not provide any material/consumables except those specifically mentioned in this tender specification.

7.1.4 **TEST BLANKS (TUBES & PIPES)**

BHEL will provide raw materials tube and pipes in random length for preparation of test coupons for conducting the site qualification test of pipe welders. Contractor shall prepare the required test blanks from such raw materials. Contractor shall arrange for raw plates and make test coupons out of such plates for testing of welders as required by BHEL.

7.2 FILLER WIRE FOR TIG WELDING

Refer Section-5 in this regard.

7.3 TOOLS & PLANTS (T&P)

7.3.1 **CRANES**

(A) BHEL will provide free of charge their one or more of 75T /100T/ 150T capacity crawler cranes **on sharing basis free of charge** as may be required in judgment of BHEL and as per the availability of these cranes for work at site and pre-assembly yard. These will not be available for material handling at stores/storage yard.

(B) Contractor shall lay necessary sleeper beds, backfilling of approaches wherever necessary for safe movement of the cranes as directed by BHEL. Contractor shall transport the equipments and components/sub assemblies/attachments of BHEL equipments to & fro between BHEL stores and site.

(C) Cranes will be initially issued in existing condition. Any alteration/addition like boom reduction/extension, assembly of components/sub-assemblies needed for modulating the capacity/reach/other features of cranes and restoration to the state as directed by BHEL shall be the contractor's responsibility.

(D) Day-to-day upkeep and running maintenance like filling / topping up of lubricants, labour for changing filters etc of BHEL cranes shall be the responsibility of the contractor. Spares if any, required in normal course will be provided by BHEL. Major breakdowns will be attended to by BHEL. The cranes provided by BHEL will be withdrawn for regular and capital maintenance as per the respective schedule of maintenance. As far as possible such schedules will be intimated to the contractor in advance and

may be adjusted depending on the work requirements at site. However no claim whatsoever will be entertained on account of non-availability of crane(s).

(E) The cranes listed above may be either BHEL owned crane and/or the hired crane. For hired crane the operator will be provided along with crane without any charge. However, for BHEL owned crane contractor has to share the charges for operator with the agency to which the crane is originally issued.

(F) Where the services of the cranes provided by BHEL are to be shared by other agencies/ contractors of BHEL, the contractor's responsibilities defined above will also be apportioned accordingly to the beneficiary agency. Working arrangements in this regard will be done at site by BHEL engineer and in any case his decision shall be final and binding.

7.4 **OTHER T & P**

7.4.1
Special tools which are supplied by BHEL manufacturing unit as part of maintenance tools to be handed over to customer under regular DU/DESS numbers in various product groups may be issued to the contractor free of charges for specific activities, at the discretion of BHEL. Contractor shall return them after the completion of the specific activity, for which the tools were spared, in good working order.

7.4.2
The contractor must not use these equipments for any purpose other than what they are intended for. Misuse, if any, will result in imposition of penalty.

7.4.3
If the above items issued to contractor are found not utilized/not maintained to the satisfaction of BHEL engineer or misused, these will be withdrawn and no replacement will be done for such items.

7.5
Steam, water and air for pre-commissioning and commissioning will be provided by BHEL/client at one point. Contractor shall make all arrangement for drawing the same from these points and connection to the system for the use during these activities.

7.6
Foundations and other necessary civil works for structures, supports and saddles etc will be provided by BHEL.

7.7
Necessary preservation agents, excepting the primer & paint, for the above work shall be provided by BHEL.

7.8
Spare parts, gaskets, packing for replacement will be provided by BHEL.

SECTION-8
SPECIAL CONDITIONS OF CONTRACT

8.1.0 INSPECTION/QUALITY ASSURANCE/ STATUTORY INSPECTION

8.1.1.1 Various inspection/ quality control/ quality assurance procedures/ methods at various stages of erection and commissioning will be as per BHEL/customer quality control procedure/ codes and other statutory provisions and as per BHEL engineer's instructions.

8.1.1.2 Preparation of quality assurance log sheets and protocols with customer/ consultants/statutory authority, welding logs, NDE records, testing & calibration records and other quality control and quality assurance documentation as per BHEL engineer's instructions, is within the scope of work/specification. These records shall be submitted to BHEL/customer for approval from time to time.

8.1.1.3 A daily logbook of all measurements and testing/calibration should be maintained by contractor on the job for detailing inspection details of various equipments.

8.1.1.4 The performance of welders will be reviewed from time to time as per the BHEL standards. Welders' performance record shall be furnished periodically. Corrective action as informed by BHEL shall be taken in respect of those welders not conforming to these standards. This may include removal/ discontinuance of concerned welder(s). Contractor shall arrange for the alternate welders immediately.

8.1.1.5 All the welders shall carry identity cards as per the pro-forma prescribed by BHEL only welders duly utilized by BHEL/customer/consultant shall be engaged on the work.

8.2.0 Contractor shall provide all the measuring monitoring devices (MMD) required for completion of the work satisfactorily. These MMD shall conform to job requirement in respect of measurement range, accuracy level & any other specification. The indicative list of MMD required for this work and to be made available by the contractor is given in APPENDIX-II. The list will be reviewed by BHEL and the contractor shall meet any augmentation needed.

8.3.0 The MMD deployed by the contractor shall, at all stages of work, have valid and current calibration certificate. The calibration of these MMD shall be got done from the agencies accredited/ approved BHEL. Copy of calibration certificates in respect of these MMD has to be submitted to BHEL. Periodical status report regarding validity of calibration has to be submitted to BHEL. Re-calibration/ re-validation shall be done for the continuity of usage, as per BHEL specifications. Contractor shall conform to the specifications of BHEL regarding storage of the MMD.

8.4.0 Re-work necessitated on account of use of invalid MMD shall be entirely to the contractor's account. He shall be responsible to take all corrective

actions, including resource augmentation if any, as specified by BHEL to make-up for the loss of time.

8.5.0 In the course of work BHEL may counter/ finally check the measurements with their own MMD. Contractor shall render all assistance in conduct of such counter/final measurements **.**

8.6.0 Total quality is the watchword of the work and contractor shall strive to achieve the quality standards, procedures laid down by BHEL. He shall follow all the instructions as per BHEL drawings and quality standards. Contractor shall provide for the services of quality assurance engineer.

8.7.0 STAGE INSPECTION BY FES/QA ENGINEERS

Apart from day-to-day inspection by BHEL engineers stationed at site and also by customer's engineers, stage inspection of equipments under erection and commissioning at various stages of erection and commissioning by teams of engineers from field engineering services of BHEL's manufacturing units and quality assurance teams from field quality assurance factory quality assurance and commissioning engineers from technical services of BHEL will also be conducted. Contractor shall arrange all labour, tools and tackles etc, for such stage inspections as part of work.

8.7.1 The contractors shall pay all fees connected with testing of his welders/workers and testing, inspection & calibration of his MMD and T&P.

8.7.2 The quality management system of BHEL, power sector – western region (PSWR) has already been certified and accredited under ISO 9002 standards in this regard. The basic philosophy of the quality management system is to define the organizational responsibility, work as per documented procedures, verify the output with respect to acceptance norms, identify the non-conforming product/ procedure and take corrective action for removal of non-conformance specifying the steps for avoiding recurrence of such non-conformities, & maintain the relevant quality records. The non-conformities are to be identified through the conduct of periodical audit of implementation of quality systems at various locations/stages of work. Suppliers/vendors of various products/services contributing in the work are also considered as part of the quality management system. .as such the contractor is expected not only to conform to the quality management system of BHEL but also it is desirable that they themselves are accredited under any quality management system standard.

SECTION-9
SPECIAL CONDITIONS OF CONTRACT

SAFETY, OCCUPATIONAL HEALTH AND ENVIRONMENTAL MANAGEMENT

Introduction:-

BHEL PSWR has been certified for environmental management under ISO 14001:1996 standard and occupational health & safety under OHSAS: 18001 by DNV. In order to comply with the above standards, it shall be the endeavor of BHEL and all its subcontractors to meet and implement the requirements by following the guidelines issued under environmental, occupational health and safety management (EHS) manual a copy of which will be available with the BHEL site-in-charge.

Contractor shall also enter into a "memorandum of understanding" as given in clause 9.9 in case of award of contract.

9.0 RESPONSIBILITY OF THE CONTRACTOR IN RESPECT OF SAFETY OF MEN, EQUIPMENT, MATERIAL AND ENVIRONMENT.

9.1 THE CONTRACTOR SHALL

9.1.1 Abide by the safety regulations applicable for the site/project and in particular as mentioned in the booklet "safe work practices" issued by BHEL. Contractors are also to ensure that their employees and workmen use safety equipments as stipulated in the factories act (latest revision) during the execution of the work. Failure to use safety equipment as required by BHEL engineer will be a sufficient reason for issuance of memo, which shall become part of safety evaluation of the contractor at the end of the project. Also all site work may be suspended if it is found that the workmen are employing unsafe working practice and all the costs/losses incurred due to suspension of work shall be borne by contractor. A comprehensive list of national standards from which the contractor can draw references for complying with various requirements under this section is given under 9.10

9.1.2 Hold BHEL harmless and indemnified from and against all claims, cost and charges under workmen's compensation act 1923 and 1933 and any amendment thereof and the contractor shall be solely responsible for the same.

9.1.3 Abide by the procedure governing entry/exit of the contractor's personnel within the customer/client premises. All the contractors employees shall be permitted to enter only on displaying of authorized photo passes or any other documents as authorised by the customer/client

9.1.4 Be fully responsible for the identity, conduct and integrity of the personnel/workers engaged by them for carrying out the contract work and ensure that none of them are ever engaged in any anti national activity

9.1.5 Prepare a sign board giving the following information and display it near the work site:

- Name of contractor
- Name of contractor site-in-charge & telephone number
- Job description in short
- Date of start of job
- Date of expected completion
- Name of BHEL site-in-charge.

9.1.6 Abide by the rules and regulations existing during the contract period as applicable for the contractors at the project premises.

9.1.7 Observe the timings of work as advised by BHEL engineer-in-charge for carrying out the contract work.

9.2 SPECIAL CONDITIONS

9.2.1 SAFETY

9.2.1.1 SAFETY PLAN

Before commencing the work, contractor shall submit a "safety plan" to the authorized BHEL official. The safety plan shall indicate in detail the measures that would be taken by the contractor to ensure safety to men, equipment, material and environment during execution of the work. The plan shall take care to satisfy all requirements specified hereunder.

The contractor shall submit "safety plan" before start of work. During negotiations, before placing of work order and during execution of the contract, BHEL shall have right to review and suggest modifications in the safety plan. Contractor shall abide by BHEL's decision in this respect.

9.2.1.2 The contractor shall take all necessary safety precautions and arrange for appropriate appliances and/or as per direction of BHEL or its authorized person to prevent loss of human lives, injuries to men engaged and damage to property and environment.

9.2.1.3 The contractor shall provide to his work force and also ensure the use of personnel protection equipment (PPE) as found necessary and/or as directed and advised by BHEL officials without which permission is liable to be denied.

- Safety helmets conforming to is 2925/1984 (1990)
- Safety belts conforming to is 3521/1989
- Safety shoes conforming to is 1989 part-ii /1986(1992)
- Eye and face protection devices conforming to is 2573/1986(1991), is 6994 (1973), part-I (1991), is 8807/1978 (1991), is 8519/1977(1991).
- Other job specific PPE'S of standard ISI make as may be prescribed

9.2.1.4 All tools, tackles, lifting appliances, material handling equipment, scaffolds, cradles, cages, 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 found to be unsafe

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

9.2.1.6 The contractor shall not use any hand lamp energized 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.

9.2.1.7 The contractor shall adopt all fire safety measures as per relevant Indian standards

9.2.1.8 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 provisions and/or storage in accordance with the rules and regulations laid down by 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. The contractor in all such matters shall also take prior approval of the authorized BHEL official at the site.

9.2.1.9 Proper means of access must be used e.g. Ladders, scaffolds, platforms etc. No makeshift access such as oil drums or pallets shall be used. Design of these will be in accordance with relevant standards and certified by competent persons before use.

9.2.1.10 Temporary arrangements made at site for lifting, platforms, approach, access etc should be properly designed and approved before being put to use.

9.2.1.11 All excavations and openings must be securely and adequately fenced/ barricaded and warning signs erected when considered necessary as per relevant code of practice.

9.2.1.12 No persons shall remove guard rails, covers or protective devices unless authorized by a responsible supervisor and alternative precautions have been taken

9.2.1.13 Access ways, means of escape and fire exits shall be clearly marked, kept clear and unobstructed at all times

9.2.1.14 Only authorized persons holding relevant license will drive and operate site plant and equipments Eg cranes, dumpers, excavators, transport vehicles etc

9.2.1.15 Only authorized personnel are allowed to repair, commission electrical equipments.

9.2.1.16 Gas cylinders shall be handled and stored as per gas cylinder rules and relevant safe working practices

9.2.1.17 All wastes generated at site shall be segregated and collected in a designated place so as to prevent spillage/contamination/scattering at site, until the waste is lifted for disposal to designated disposal area as advised by BHEL official.

9.2.1.18 The contractor shall arrange at his cost (wherever not specified) appropriate illumination at all work spots for safe working when natural day light is not adequate for clear visibility.

9.2.1.19 The contractor shall train adequate number of workers/supervisors for administering "first aid". List of competent first aid administers should be prominently displayed.

9.2.1.20 The contractor shall display at strategic places and in adequate numbers the following in fluorescent markings

- Emergency telephone numbers
- Exit, walkways
- Safe working load charts for wire ropes, slings, d shackles etc
- Warning signs

9.2.1.21 The contractor shall be held responsible for any violation of statutory regulations (local, state or central) and BHEL instructions that may endanger safety of men, equipment, material and environment in his scope of work or other contractors or agencies. Cost of damage, if any, to life and property arising out of such violation of statutory regulations and BHEL instructions shall be borne by the contractor.

9.2.1.22 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.

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

9.2.1.24 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 payments due to the contractor after notifying the contractor suitably and giving him opportunity to present his case.

9.2.1.25 If the contractor fails to improve the standards of safety in its operation to the satisfaction of BHEL after being given a 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 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.

9.2.1.26 **Emergency Response**

9.2.1.15.1 BHEL will have an emergency response plan for each project site in consultation with the owner as the case may be, detailing the procedure for mobilization of personnel and equipment, and defining the responsibilities of the personnel indicated, in order to prepare for any emergency that may arise in order to ensure the priorities of

- Safeguard of life
- Protect assets under construction or neighboring
- Protect environment
- Resumption of normal operations as soon as the emergency condition is called off

All contractors shall also be part of the emergency response plan and the personnel so nominated shall be aware of their duties and responsibilities in an emergency response situation.

9.2.1.15.2 At least 5% contractor's supervisors and workmen shall undergo training in administering 'first aid'. The trained persons should represent for all categories of work and for all areas of work. Adequate number of trained persons should be available for each shift. These first aiders shall be included in the emergency response team. Contractor employees and workmen are encouraged to participate in first aid training programmes whenever organized by BHEL.

9.2.2 Occupational Health

9.2.2.1 Specific occupational health hazards will be identified through the hazard evaluation processes in consultation with BHEL engineers and the necessary prevention/reduction/elimination methods implemented.

9.2.2.2 All personnel working in an activity with a potential risk to health shall be made aware of all those risks and the actions they must take to reduce/control/eliminate the risk

9.2.2.3 Safety coordinator shall conduct periodic checks to ensure that every group of workers engaged in similar activities are aware of potential risks to health and the actions required to be taken to mitigate the risk

9.2.2.4 In order to protect personnel from associated health hazards, the following main areas will be focused.

- Issue of approved personnel protective equipment

- Verification that the PPE are adequate/maintained and worn by all staff involved in operations that are potentially hazardous to their health
- Ensure that the personnel deployed are physically fit for the operation/work concerned
- Provide hygienic and sanitary working conditions

9.2.2.5 Contractor workers employees engaged in noise risk areas shall be issued with hearing protection aids and the use of the same will be enforced. Further, these workers will be educated on the hazards of noise

9.2.2.6 Contractor workers engaged in dust environment shall be issued with necessary dust protection aids and the use of the same shall be enforced

9.2.2.7 Workers engaged in exposure to bright light/rays as in welding or radiation shall be issued with eye protection devices and the use of the same shall be enforced

9.2.2.8 Adequate arrangements shall be made to provide safe drinking water

9.2.2.9 Health monitoring records on at least sample basis for contractor employees & workmen shall be maintained for persons engaged in specified categories of work. These shall include

- Noise induced hearing loss
- Lung function test
- Ergonomic test
- Eye test for welders, grinders, drivers etc

9.2.3.0 HYGIENE AND HOUSEKEEPING

9.2.3.1 Good house keeping and proper hygiene is one of the key requirements of occupational health safety and environment management. Towards this the contractor shall encourage his workers and supervisors to maintain cleanliness in their area of work.

9.2.3.2 The contractor shall arrange to place waste bins/chutes at convenient locations for the collection of scrap and other wastes. The bins shall be clearly marked and segregated for metal, non-metal, hazardous and non hazardous wastes.

9.2.3.3 BHEL may take up appropriate remedial measures at the cost of the contractors if the contractors fail good house keeping and if there is an imminent risk of pollution

9.2.4 ENVIRONMENT MANAGEMENT

9.2.4.1 BHEL has a sound environmental management system, which is to be maintained and implemented by all the contractors. The system allows for project specific objectives to be set and developed sensitive to client requirements, applicable environmental legislation and BHEL's own objectives and policy. BHEL engineers will assess and monitor the environmental impact of their work and lay

out objectives for their minimization. The contractors shall implement the objectives for continual improvement of environmental performance. BHEL shall regularly audit environmental impacts and their improvements.

9.2.4.2 WASTE MANAGEMENT

9.2.4.3.1 The objective of waste management is to ensure the safe and responsible disposal of waste, ensuring that it is correctly disposed of and being able to audit the process to ensure compliance.

9.2.4.3.2 Chemical wastes if any shall be collected separately and disposed of to BHEL designated refuse yard as per BHEL advise

9.2.4.3.3 No dangerous chemicals, noxious waste products or materials will be disposed off on or off site without approval obtained through BHEL.

9.2.4.3.4 All disposal of wastes generated during construction shall be in accordance with all relevant legislation.

9.2.4.3.5 Acid and alkali cleaning wastes shall be neutralized to acceptable norms before disposal to the designated area.

9.2.4.3.6 All necessary measures shall be taken to ensure safe collection and disposal of waste oils. In particular to ensure the prevention of their discharge into surface waters, ground waters, coastal waters or drainages

9.3 SUPERVISION

9.3.1 Contractor must provide at least one full time on site safety coordinator when the manpower engaged is in excess of 50 for the contract activities in the premises. If the manpower is less than 50, the on site safety coordination responsibilities shall be assumed by any one of the contractor's other supervisory staff; however in both the cases, the contractor must specify in writing the name of such persons to the BHEL engineer in charge .

9.3.2 Contractor's safety coordinator or his supervisor responsible for safety as the case may be shall conduct at his work site, and document formal safety inspection and audits at least once in a week. Such documents are to be submitted to BHEL engineer in charge for his review and record.

9.3.3 Contractor, supervisor must attend all schedule safety meetings as would be intimated to him by the BHEL engineer in charge.

9.3.4

9.3.5 Before starting work under any contract, the contractor must ensure that a job specific safety procedures/field practices as required over and above the safety permit conditions are prepared and followed .he should also ensure that all supervisors and workers involved understand and follow this procedures /field practices.

9.3.6 Contractor must ensure that in his work site appropriate display boards are put displaying signs for site safety , potential hazards and precautions required

9.4.0 TRAINING & AWARENESS

9.4.1 Contractor shall deploy experienced supervisors and other manpower who are well conversant with the safety and environment regulations of the project. The electricians to be deployed on the job should have wireman license.

9.4.2 All supervisors & workmen of the contractor shall undergo fire safety training/demonstration whenever arranged by BHEL with the help of either customer's fire and safety department or outside faculty so as to acquire knowledge of fire prevention and also to be able to make use of appropriate fire extinguishers.

9.4.3 Contractor must familiarize himself from BHEL engineer in charge about all known potential fire, explosion or toxic release hazards related to the contract. He in turn will ensure that same information has been passed to the supervisors and workmen

9.4.4 Contractor must ensure that all his supervisors are properly trained and each employee has received and understood from his supervisor necessary training and briefing about the safety requirement. Necessary document as a means to verify that employees have understood the training is to be maintained.

9.4.5 The contractor supervisors shall also give a small safety briefing to all the workmen under his charge before undertaking any new work and specially understand the safety requirements that are mandatory

9.5.0 REPORTING

9.5.1 The contractor shall submit report of all accidents, fires and property damage, dangerous occurrences to the authorized BHEL official immediately after such occurrence but in any case not later than twelve hours of the occurrence. Such report shall be furnished in the manner prescribed by BHEL and also to meet statutory requirement.

9.5.2 Any injury sustained by any of the contractor's employees within the project premises must be reported to BHEL supervisor and first aid should be immediately administered. The contractor shall be responsible for keeping and maintaining proper records of accidents to his personnel.

9.5.3 Contractor must arrange to immediately investigate, properly document and report any injury, accident or near miss involving any of his employees and take appropriate follow up action. He must furnish within 12 hours of the incident a written report to BHEL engineer in charge and the safety section.

9.5.4 According to the factory act and the employee's state insurance act & regulation, any person sustaining any injury within the project premises and absenting himself from work for more than 46 hours, his accident report has to be

sent to the respective government authorities. Therefore contractor shall inform the owner's representative such matter immediately for their needful action.

9.5.5 In addition, contractor shall submit periodic reports on safety to the authorized BHEL official from time to time as prescribed.

9.5.6 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.

9.6 **AUDIT REVIEW AND INSPECTION**

9.6.1 BHEL shall conduct audit on the contractor performance and compliance with the project specific requirements of the environment and occupational health & safety management systems. The programme of audit shall cover all activities under the contract but will focus particularly on high-risk activities. The construction manager shall decide the schedule of audit. The audit findings shall be communicated to the contractors and necessary remedial action as advised by BHEL engineers shall be under taken within the stipulated time.

9.6.2 Inspections shall be carried out regularly by the contractors and by BHEL engineers on activities, facilities, equipment, documentation, to cover the following aspects.

- Compliance with procedures and systems
- Availability, condition and use of PPE
- Condition of maintenance tools, equipments, facilities
- Availability of fire fighting equipments and its condition
- Use of fire fighting equipments and first aid kit
- Awareness of occupational health hazard
- Awareness of safe working practices
- Presence of quality supervision
- Housekeeping

The safety co-ordinator shall visit and inspect work sites daily. All unsafe acts, unsafe conditions that have imminent potential for causing harm/injury/damage will be immediately corrected. He shall maintain a daily logbook giving details of unsafe acts or conditions observed and the corrective action taken and recommendations for preventing recurrence. Adequacy of corrective actions will be verified.

The contractor shall take remedial measures as per the findings of each inspection

Besides the above, the contractor shall be required to carry out the following inspections

SN	Equipment	Scope of inspection	Inspection by	Schedule
1	Hand tools	To identify unsafe/defective tool	User	Daily
2	Power tools	To identify unsafe/defective tool	User	Daily
3	Fire extinguishers	To check pressure and any defect	User Safety	Daily

SN	Equipment	Scope of inspection	Inspection by	Schedule
			coordinator	Every month
4	Lifting equipment/tackles	To check for defects and efficacy of brakes	User Third party	Daily Every year
5	PPE	To check for defects	User	Daily

9.7 **NON COMPLIANCE**:-

9.7.1 NONCONFORMITY OF SAFETY RULES AND SAFETY APPLIANCES WILL BE VIEWED SERIOUSLY AND THE BHEL HAS RIGHT TO IMPOSE FINES ON THE CONTRACTOR AS UNDER **FOR EVERY INSTANCE OF VIOLATION** NOTICED:

SN	INCIDENT OF VIOLATION	FINE (Rs)
01	Not wearing safety helmet	50/-
02.	Not wearing safety belt	100/-
03.	Grinding without goggles	50/-
04.	Not using 24 v supply for internal work	500/-
05.	Electrical plugs not used for hand machine	100/-
06.	Not slinging property	200/-
07.	Using damaged sling	200/-
08.	Lifting cylinders without cage	500/-
09.	Not using proper welding cable with lot of joints and not insulated property.	200/-
10.	Not removing small scrap from platforms	200/-
11.	Gas cutting without taking proper precaution or not using sheet below gas cutting	200/-
12.	Not maintaining electric winches which are operated dangerously	500/-
13.	Improper earthing of electrical T&P	500/-
14.	Accident resulting in partial loss in earning capacity	25,000/- per victim
15.	Fatal accident/accidents resulting in total loss in earning capacity	1,00,000/- per victim

Any other non-conformity noticed not listed above will also be fined as deemed fit by BHEL. The decision of BHEL engineer is final on the above. The amount will be deducted from running bills of the contractor. The amount collected above will be utilized for giving award to the employees who could avoid accident by following safety rules. Also the amount will be spent for purchasing the safety appliances and supporting the safety activity at site.

9.8 Citation:-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

9.9 MEMORANDUM OF UNDERSTANDING

After award of work, contractors are required to enter into a memorandum of understanding as given below:

4 MEMORANDUM OF UNDERSTANDING

BHEL PSWR is committed to health, safety and environment policy (EHS policy) as given in the booklet titled "safe working practices" issued to all contractors.

M/s _____ do hereby also commit to the same EHS policy while executing the contract number _____

M/s _____ shall ensure that safe work practices not limited to the above booklet are followed by all construction workers and supervisors. Spirit and content therein shall be reached to all workers and supervisors for compliance.

BHEL will be carrying out EHS audits twice a year and M/s _____ shall ensure to close any non-conformity observed/ reported within fifteen days.

Signed by authorised representative of m/s----------

Name :

Place & date:

9.10 COMPREHENSIVE LIST OF NATIONAL STANDARDS FOR REFERENCE AND USE WHEREVER APPLICABLE IN THE EXECUTION OF CIVIL, ERECTION AND COMMISSIONING CONTRACTS

IS NO	YEAR	AMD UPTO	DESCRIPTION
IS 10204	1982		PORTABLE FIRE EXTINGUISHERS MECHANICAL FOAM TYPE
IS 10245	1994		SPECIFICATION FOR BREATHING APPARATUS
IS 10291	1982		SAFETY CODE FOR DRESS DRIVERS IN CIVIL ENGINEERING WORKS
IS 10658	1983		HIGHER CAPACITY DRY POWDER FIRE EXTINGUISHERS (TROLLEY MOUNTED)
IS 10662	1992		COLOUR TELEVISION
IS 10667	1983		GUIDE FOR SELECTION OF INDUSTRIAL SAFETY EQUIPMENT FOR PROTECTION OF FOOT AND LEG
IS 11037	1984		ELECTRONIC FAN REGULATORS
IS 11057	1984		INDUSTRIAL SAFETY NETS
IS 11451	1998		RECOMMENDATION FOR SAFETY AND HEALTH REQUIREMENT RELATING TO OCCUPATION EXPOSURE TO ASBESTOS
IS 1169	1967		PEDESTAL FANS
IS 1179	1967		SPECIFICATION FOR EQUIPMENT FOR EYE AND FACE PROTECTION DURING WELDING
IS 11833	1986		DRY POWDER FIRE EXTINGUISHERS FOR METAL FIRES
IS 11972	1987		CODE OF PRACTICE FOR SAFETY PRECAUTION TO BE TAKEN WHEN ENTERING A SEWARAGE SYSTEM
IS 1287	1986		ELECTRIC TOASTER
IS 13063	1991		STRUCTURAL SAFETY OF BUILDINGS ON SHALLOW FOUNDATIONS ON ROCKS
IS 13385	1992		SPECIFICATIONS FOR FIRE EXTINGUISHERS 50 LITRE WHEEL MOUNTED WATER TYPE (GAS CARTRIDGES)
IS 13386	1992		SPECIFICATIONS FOR FIRE EXTINGUISHERS 50 LITRE MECHANICAL FOAM TYPE
IS 13415	1992		CODE OF SAFETY FOR PROTECTIVE BARRIERS IN AND AROUND BUILDINGS
IS 13416	1992		RECOMMENDATIONS FOR PREVENTIVE MEASURES AGAINST HAZARDS AT WORKING PLACE PART 1 TO PART 5
IS 13430	1992		CODE OF PRACTICE FOR SAFETY DURING

IS NO	YEAR	AMD UPTO	DESCRIPTION
			ADDITIONAL CONSTRUCTION AND ALTERATION TO EXISTING BUILDINGS
IS 13849	1993		PORTABLE FIRE EXTINGUISHERS DRY POWDER TYPE (CONSTANT PRESSURE)
IS 1446	1985		CLASSIFICATION OF DANGEROUS GOODS (FIRST REVISION)
IS 1476	1979		REFRIGERATORS
IS 1641	1988		CODE OF PRACTICE FOR FIRE SAFETY OF BUILDINGS (GENERAL): GENERAL PRINCIPLES OF FIRE GRADING AND CLASSIFICATION
IS 1642	1989		CODE OF PRACTICE FOR FIRE SAFETY OF BUILDINGS - DETAILS OF CONSTRUCTION
IS 1643	1988		CODE OF PRACTICE FOR FIRE SAFETY OF BUILDINGS (GENERAL): EXPOSURE HAZARD
IS 1646	1997		CODE OF PRACTICE FOR FIRE SAFETY OF BUILDINGS (GENERAL): ELECTRICAL INSTALLATIONS
IS 1904	1986		CODE OF PRACTICE FOR DESIGN AND CONSTRUCTION OF FOUNDATIONS IN SOIL
IS 1905	1987		STRUCTURAL SAFETY OF BUILDINGS MASONARY WALLS
IS 2082	1985		ELECTRICAL GEYSERS
IS 2171	1985		PORTABLE FIRE EXTINGUISHERS DRY POWDER TYPE (CARTRIDGE)
IS 2309	1989		PRACTICE FOR THE PROTECTION OF BUILDINGS AND ALLIED BUILDINGS AGAINST LIGHTENING
IS 2312	1967		EXHAUST FANS
IS 2361	1994		SPECIFICATION FOR BUILDING GRIPS - FIRST REVISION
IS 2418	1977		TUBULAR FLUORSCENT LAMPS IS 2418 (FT-1)
IS 2750	1964		STEEL SCAFFOLDINGS
IS 2762	1964		SAFE WORKING LOADS IN KGS FOR WIRE ROPE SLINGS
IS 2878	1986		FIRE EXTINGUISHERS CARBON DIOXIDE TYPE (PORTABLE AND TROLLEY MOUNTED)
IS 2925	1984		SPECIFICATION FOR INDUSTRIAL SAFETY HELMETS
IS 3016	1982		CODE OF PRACTICE FOR FIRE PRECAUTIONS IN WELDING AND CUTTING OPERATIONS- FIRST REVISION
IS 3315	1974		DESERT COOLERS

IS NO	YEAR	AMD UPTO	DESCRIPTION
IS 3521	1989		INDUSTRIAL SAFETY BELTS AND HARNESS
IS 368	1983		IMMERSION WATER HEATERS
IS 3696	1991		SAFETY CODE OF SCAFFOLDS AND LADDERS PART 1 TO 2
IS 3737	1996		LEATHER SAFETY BOOTS FOR WORKERS IN HEAVY METAL INDUSTRIES
IS 374	1979		CEILING FANS INCLUDING REGULATORS
IS 3764	1992		EXCAVATION WORK - CODE OF SAFETY
IS 3786	1983		METHOD FOR COMPUTATION OF FREQUENCY AND SEVERITY RATES FOR INDUSTRIAL INJURIES AND CLASSIFICATION OF INDUSTRIAL ACCIDENTS
IS 3935	1966		CODE OF PRACTICE FOR COMPOSITE CONSTRUCTION
IS 4014	1967		CODE OF PRACTICE FOR STEEL TUBULAR SCAFFOLDING
IS 4081	1986		SAFETY CODE FOR BLASTING AND RELATED DRILLING OPERATIONS
IS 4082	1977	1996	STACKING AND STORAGE OF CONSTRUCTION MATERIALS AND COMPONENTS AT SITE
IS 4130	1991		DEMOLITION OF BUILDINGS - CODE OF SAFETY PART 1 TO 2
IS 4138	1977		SAFETY CODE FOR WORKING IN COMPRESSED AIR (FIRST REVISION)
IS 4155	1966		GLOSSARY OF TERMS RELATING TO CHEMICAL AND RADIATION HAZARDS AND HAZARDOUS CHEMICALS
IS 4209	1967		CODE OF SAFETY FOR CHEMICAL LABORATORY
IS 4250	1980		FOOD MIXERS
IS 4262	1967		CODE OF SAFETY FOR SULFURIC ACID
IS 4756	1978		SAFETY CODE FOR TUNNELING WORK
IS 4912	1978		SAFETY REQUIREMENTS FOR FLOOR AND WALL OPENINGS, RAILINGS AND TOE BOARDS
IS 5121	1969		SAFETY CODE FOR PILING AND OTHER DEEP FOUNDATIONS
IS 5182	1969	1982	METHODS FOR MEASUREMENT OF AIR POLLUTION
IS 5184	1969		CODE OF SAFETY FOR HYDROFLUORIC ACID
IS 5216	1982	2000	RECOMMENDATIONS ON SAFETY

IS NO	YEAR	AMD UPTO	DESCRIPTION
			PROCEDURES AND PRACTICE IN ELECTRICAL WORK PART I AND II
IS 555	1979		TABLE FANS
IS 5557	1995		INDUSTRIAL AND SAFETY LINED RUBBER BOOTS (SECOND REVISION)
IS 5916	1970		SAFETY CODE FOR CONSTRUCTION INVOLVING USE OF HOR BITUMINOUS MATERIALS
IS 5983	1980		SPECIFICATION FOR EYE PROTECTORS - FIRST REVISION
IS 6234	1986		PORTABLE FIRE EXTINGUISHERS WATER TYPE (STORED PRESSURE)
IS 692	1994		CRITERIA FOR SAFETY AND DESIGN OF STRUCTURES SUBJECTED TO UNDERGROUND BLASTS
IS 6994	1973		SPECIFICATION FOR SAFETY GLOVES
IS 7155	1986		CODE OF RECOMMENDED PRACTICE FOR CONVEYOR SAFETY (PART 1 TO 8)
IS 7205	1974		SAFETY CODE FOR ERECTION OF STRUCTURAL STEEL WORK
IS 7293	1974		SAFETY CODE FOR WORKING WITH CONSTRUCTION MACHINERY
IS 7323	1994		GUIDELINES FOR OPERATIONS OF RESERVOIRS
IS 7812	1975		CODE OF SAFETY FOR MERCURY
IS 7969	1975		SAFETY CODE FOR HANDLING AND STORAGE OF BUILDING MATERIALS
IS 8089	1976		CODE OF SAFE PRACTICE FOR LAYOUT OF OUTSIDE FACILITIES IN AN INDUSTRIAL PLANT
IS 8091	1976		CODE OF PRACTICE FOR INDUSTRIAL PLANT LAYOUT
IS 8095	1976		ACCIDENTS PREVENTION TAGS
IS 818	1968	1997	CODE OF PRACTICE FOR SAFETY AND HEALTH REQUIREMENTS IN ELECTRIC AND GAS WELDING, AND CUTTING OPERATIONS
IS 8448	1989		AUTOMATIC LINE VOLTAGE CORRECTOR (STABILISER)
IS 8519	1977		GUIDE FOR SELECTION OF INDUSTRIAL SAFETY EQUIPMENT FOR BODY PROTECTION
IS 8520	1977		GUIDE FOR SELECTION OF INDUSTRIAL SAFETY EQUIPMENT FOR EYE, FACE AND EAR PROTECTION

IS NO	YEAR	AMD UPTO	DESCRIPTION
IS 875	1987		STRUCTURAL SAFETY OF BUILDING: LOADING STANDARD PART 1 TO 5
IS 8807	1978		GUIDE FOR SELECTION OF INDUSTRIAL SAFETY EQUIPMENT FOR PROTECTION OF ARMS AND HANDS
IS 8978	1985		INSTANTANEOUS WATER HEATERS
IS 8989	1978		SAFETY CODE FOR ERECTION OF CONCRETE FRAMED STRUCTURES
IS 940	1989		PORTABLE FIRE EXTINGUISHERS WATER TYPE (GAS CARTRIDGE)
IS 9457	1980		SAFETY COLOURS AND SIGNS
IS 9679	1980		CODE OF SAFETY FOR WORK ENVIRONMENTAL MONITORING
IS 9706	1997		CODE OF PRACTICE FOR THE CONSTRUCTION OF AERIAL RPEWAYS FOR THE TRANSPORTATION OF MATERIAL
IS 9759	1981		GUIDELINES FOR DEWATERING DURING CONSTRUCTION
IS 9815	1989		SERVO MOTOR OPERATED LINE VOLTAGE CORRECTOR (SERVO STABILISER)
IS 9944	1992		RECOMMENDATIONS ON SAFE WORKING LOAD FOR NATURAL AND MAN-MADE FIBRE ROPE SLINGS
IS 996	1979		SINGLE PHASE ELECTRIC MOTORS
ISO 3873	1977		SAFETY HELMET

SECTION-10

SPECIAL CONDITIONS OF CONTRACT

10.0 DRAWINGS AND DOCUMENTS

10.1 The detailed drawings, specifications available with BHEL engineers will also form part of this tender specification. Revision of drawings/documents may take place due to various considerations as is normal in such large project. Work will have to be carried out as per revised drawings/ documents. These documents will be made available to the contractor during execution of work at site.

10.2 One set of necessary drawings/documents to carry out the erection work will be furnished to the contractor by BHEL on loan that shall be returned to BHEL after completion of the work. Contractor's personnel shall take care of these documents given to them.

10.3 The data furnished in various sections and appendices and the drawings enclosed with this tender specification describe the equipment to be installed, tested and commissioned under this specification, briefly. However, the changes in the design and in the quantity may be expected to occur as is usual in any such large scale of works.

10.4 If any error or ambiguity is discovered in the specification/information contained in the documents/drawings and tender, the contractor shall forthwith bring the same to the notice of BHEL before submission of offer.

10.5 In case an ambiguity is detected after award of work, the same must be brought to the notice of BHEL before commencement of the work/activity. BHEL's interpretation in such cases will be final and binding on the contractor.

10.6 In case of any conflict between General Instructions to Bidders, General Conditions of Contract contained in Sections 1 & 2 respectively and Special Conditions of Contract contained in Sections 4 to 15 and Appendices, provisions contained in Special Conditions of Contract in Sections 4 to 15 and Appendices shall prevail.

10.7 In case of discrepancy between quoted item rate and corresponding amount in the rate schedule, the **quoted item rates shall be reckoned as correct and amount recalculated**. Quoted item rates shall also prevail for arriving at the total price quoted for offer evaluation and Work Order placement.

10.8 The total work will be awarded by BHEL to a single bidder without splitting.

10.9 Bank Guarantees to be furnished by the contractor towards Security Deposit and Performance Guarantee (last 5% payment against workmanship warranty/defect liability) shall have a claim period of six months over and above the validity period required for the respective cases.

SECTION-11
SPECIAL CONDITIONS OF CONTRACT

11.0 TIME SCHEDULE, MOBILISATION, PROGRESS AND MONITORING, COMPLETION ETC

11.1 INITIAL MOBILIZATION AND TENTATIVE SCHEDULE

Contractor shall reach site, make his site establishment and be ready to commence the work within **four weeks** from the date of fax letter of intent (LOI) or as per directions of construction manager of BHEL.

The contractor has to subsequently augment his resources in such a manner that the entire work is completed to achieve the following schedule:

SN	ACTIVITY/MILESTONE	TENTATIVE SCHEDULED COMPLN	
		UNIT#1	UNIT#2
01	BOILER LIGHT UP & ALKALI BOIL OUT COMPLETION	July '08	Nov '08
02	SYNCHRONIZATION & COAL FIRING	Sept '08	Jan '08
03	COMPLETION OF TRIAL OPERATION	Nov '08	Mar '08
04	COMPLETION OF FACILITIES	Feb '09	April'09

11.2
The contractor shall reach site and establish his site office and mobilize to commence the work as per directions of BHEL engineer. Mutually agreed programme shall be drawn by the contractor primarily to achieve the schedules as above, taking into account available and anticipated materials inflow, and other inputs. These may have to be further fine tuned with shorter duration programmes as the case may be.

The contract period shall commence from the date of erection of first major equipment / component / assembly / sub-assembly in its permanent location/ foundation. Minor components like sole plate/packer plate/anchor etc. will not be considered for this purpose.

11.3 CONTRACT PERIOD & GRACE PERIOD

The total contract period will be **15 (FIFTEEN) months**, however each unit has to be completed within the time schedule specified above.

Grace period of 3 (three) months beyond the end of contract period will be applicable at the discretion of BHEL.

11.4.0 PROGRESS MONITORING, CONTRACT EXTENSION AND OVERRUN

11.4.1 PROGRESS MONITORING

Progress will be reviewed periodically including month end review vis-à-vis the plans drawn as above. The contractor shall submit periodical progress reports, and other reports/ information including manpower, consumables etc, as desired by BHEL.

11.5 ASCERTAINING AND ESTABLISHING THE REASONS FOR SHORTFALL

The onus probandi that the causes leading to extension in the contract period is not due to any reasons attributable to the contractor is on him (the contractor). Review of the performance as stated vide cl. 11.3.1 above will be made considering the availability of components to be erected and other inputs over which the contractor has no control. The programme will be reviewed area-wise and the following facts will be recorded in case of shortfall at the end of every month:

1. Erection/commissioning programme not achieved owing to non-availability of fronts.

2 Erection/commissioning programme not achieved owing to non-availability of materials.

3. Erection/commissioning programme not achieved owing to non-availability of tools and plants, manpower and consumables by the contractor or any other reason attributable to the contractor.

11.6 CONTRACT EXTENSION

If the completion of work as detailed in these specification gets delayed beyond the end of contract period and grace period then depending on the balance work left out, BHEL at its discretion may extend the contract.

11.6.1
A joint programme shall be drawn for the work to be completed during the extended contract period. Review of the program and record of shortfall as describe vide clause no. 11.2.2 shall be done during the extended period. The over run charges will be paid in proportion to the achievement of the respective month vis-à-vis the plan for the month (for assessing the performance, the agreed plan shall be reduced by shortfall attributable to the BHEL). BHEL may disallow contractor's claim for over run charges if the monthly programme as mentioned here not made by him.

11.6.2
The part of extension attributable to the contractor, if any, in total contract extension shall be exhausted first i.e. immediately after end of grace period. This shall be followed by the extension on account of force majeure conditions, if any, and then on account of BHEL.

11.7.0 OVERRUN COMPENSATION

If the contract is extended for any reason other than those attributable to the contractor or force majeure conditions, the contractor will be compensated by payment of overrun charges at the rate of rs.50,000/- (rupees fifty thousand only) per month. Overrun compensation will be paid for the extension attributable to

BHEL. No overrun compensation will be payable for the extension on account of reasons attributable to contractor and/or force majeure conditions.

11.8 PRICE VARIATION

11.8.1
The accepted Item rates shall remain firm throughout the contract period, grace period and extension period, if any. No price variation is provided for in this contract. Accordingly clause 2.15 of general conditions of contract is not applicable.

11.8.2 VARIATION IN QUANTITIES & MEASUREMENT OF WORK

Quantities indicated in rate schedule are approximate and liable to vary/alter at the discretion of BHEL. The accepted unit rates shall remain firm for any variation in the indicated quantities.

11.9 INTEREST BEARING RECOVERABLE ADVANCE

Interest bearing (rate of interest will be 1% per annum more than bank interest rate, on monthly reducing balance basis) recoverable advance limited to 5% of the contract value may be paid by BHEL at its discretion depending on the merit of the case against receipt & acceptance of bank guarantee from the contractor for the amount sought. This bank guarantee (BG) shall be valid at least for one year or the recovery duration. In case recovery of dues does not get completed within the aforesaid BG validity period, the contractor must renew the validity of BG or submit fresh BG for the outstanding amount and remaining recovery period. BHEL is entitled to make recovery of the entire outstanding amount in case the contractor fails to comply with the BG requirement as above.

Recovery of dues will be made minimum @ 10% of the admitted gross running bill amount from the first applicable running bill onwards till entire due (principal plus interest) is recovered. In the event sufficient time duration is not left for recovery @10%, the rate of recovery shall be suitably enhanced so that entire due is recovered within the contract period (including extensions granted or foreclosure if any).

11.10 DEFINITION OF WORK COMPLETION

The contractor's scope of work under these specifications will be deemed to have been completed in all respect, only when all the activities are completed satisfactorily and so certified by BHEL site in charge. The decision of BHEL in this regard shall be final and binding on the contractor.

SECTION-12

SPECIAL CONDITIONS OF CONTRACT

12.1 **PAYMENT FOR WORK COMPLETED**.

12.0 **TERMS OF PAYMENT**

12.0.1
The contractor shall submit his monthly on account bills with all the details required by BHEL on specified date every month covering progress of work in all respects and areas from the 25th of previous calendar month to 24th of the current month.

12.0.2
Clause 2.6 of general conditions of contract shall be referred to as regards mode of payment and measurement of the work completed.

12.0.3
Release of payment in each running bill will be restricted to 95% of the value of work admitted, as per the percentage break-up for the stage of work completion stipulated vide clauses hereinafter. The 5% thus remaining shall be on account of workmanship guarantee of work executed. The same will be released after completion of the guarantee period of 15 months from the date of completion of entire work as certified by BHEL. However, this amount may be released earlier on receipt and acceptance of bank guarantee of equal amount in prescribed format and the BG shall be kept valid till completion of such guarantee period and an additional six months claim period.

12.0.4
The contractor shall submit his bills once in a calendar month duly furnishing all due information as desired by BHEL. Payment for running bills will normally be released in around 30 days of submission of running bill with measurement sheets. Contractor shall make his own arrangement for making payment of impending labour wages and other dues in the meanwhile.

12.2 STAGES OF PROGRESSIVE PRO-RATA PAYMENTS

12.2.1 PIPES & VALVES (ITEM NO. 1 OF RATE SCHEDULE)

(A) FOR PIPES WITHOUT PRE ASSEMBLY

(i) 25% of contract rate on pro rata basis on Placement/Erection

(ii) 30% of contract rate on pro rata basis on Fit up, Alignment and Welding

(iii) 20% of contract rate on pro rata basis on completion of Radiography/NDE

(iv) 15% of contract rate on pro rata basis on completion of Hydro test.

(v) 05% of contract rate on pro-rata basis on release for Concrete Encasement

or

05% of contract rate on pro-rata basis on release/ loading on permanent hangers & supports

(vi) 05% of contract value on completion of Trial Operation of respective units.

(B) FOR PIPES WITH PRE ASSEMBLY

(i) 35% of contract rate on pro rata basis on completion of Pre-assembly, Joint Fit-Up and Welding.

(ii) 10% of contract rate on pro rata basis on completion of radiography / NDE of pre-assy. Joints.

(iii) 35% of contract rate on pro rata basis on completion of erection in position, joint fit-up, in-situ welding.

(iv) 10% of contract rate on pro rata basis on completion of Radiography Test / NDE of in-situ weld joints.

(v) 05% of contract rate on pro-rata basis on release for Concrete Encasement

or

05% of contract rate on pro-rata basis on release/ loading on permanent hangers & supports

(vi) 05% of contract value on completion of Trial Operation of respective units.

12.2.2 Fabrication, Erection and Painting of supporting structures (item no. 2 of rate schedule)

(i) 40% of contract rate on pro-rata basis after completion of pre-assembly if required, placement and fit up in position with tack welding.

(ii) 55% of contract rate on pro-rata basis after completion of Welding, NDE, transfer of load and removal of temporary supports/scraps etc.

(iii) 5% of contract rate on pro-rata basis after completion of Trial Operation.

12.2.3 Radiography of site weld {Refer clause 4.3.0 (Q)}

100% of contract rate or pro rata basis on acceptance of films as good by BHEL.

12.3 Measurement of the work completed

A) Where payment is to be made on the basis of weight, the weight per unit given in the BHEL document only shall be taken in to consideration. In case such information is not available in BHEL documents, then the Indian standards in this regard shall be applied.

B) Spares, surplus quantity, erection contingency materials will not be paid for unless the same has been consumed in place of regular item of measurable work as per the rate schedule.

C) Where the payment is made on the basis of item rate, actual executed quantity measured jointly shall only be paid for.

D) It is clarified that as far as weight constituted by welding consumables and other consumables supplied by BHEL as well as by the contractor, shall be ignored for the purpose payment.

E) BHEL engineer's decision regarding stage of payment corresponding to progress of work, calculation of weight etc will be final and binding on the contractor.

F) No separate payment shall be made for grouting of equipments, structures etc specified elsewhere in these specifications.

G) No separate payment will be made for the weight/volume of lubricant, oils, chemicals, gases, water, preservatives etc.

H) No payment will be made for the special tools etc. Used in various activities of this work.

SECTION-13

SPECIAL CONDITIONS OF CONTRACT

13.0 EXTRA CHARGES FOR MODIFICATION AND RECTIFICATION

13.1 If extra works (requiring less than 100 man hours) for modification, rework, revamping, in brief, any work done to change the state existing to a stage desired and also fabrication, all or any, needed due to any change in or deviation from the drawings and design of equipment, operation/ maintenance requirements, mismatching, transit damages and other allied works which are not very specifically indicated in the drawings, but are found essential for satisfactory completion of the work, are done, no extra charges will be paid. The bidders are requested to take this aspect into account and the quoted rate should include all such contingencies.

However, BHEL may consider for payment as extra on man day basis, for such of those works detailed in clause 13.1 which require more than 100 man hours and such payment will be regulated by the terms, conditions and stipulations contained in the clauses contained hereinafter. It may be specifically noted that the decision of BHEL as to whether such payment is due shall be final and binding on the contractor.

13.2 A separately identifiable gang should do extra works, without affecting routine activities. Daily log sheets in the pro format prescribed by BHEL should be maintained and shall be signed by the contractor's representative and BHEL engineer. No claim for extra work will be considered/entertained in the absence of the said supporting documents i.e.. Daily log sheets. It may, however, be noted that signing of log sheets by BHEL engineer does not mean the acceptance of such works as payable extra works.

13.3 Such extra works arising out of transit, storage and erection damages,payment, if found due, will be regulated as per section-14.

13.4 BHEL retains the right to award or not to award any of the major repair/rework/modification/rectification/fabrication works as defined above to the contractor, at their discretion without assigning any reason for the same.

13.5 It shall be noted that all extra works that arise on account of the contractor's fault, will have to be carried out by the contractor free of cost. Under such circumstances, any material and consumable required for this purpose will also have to be arranged by the contractor at his cost.

13.6 After eligibility of extra works is established and finally accepted by BHEL engineer/ designer, payment will be released on competent authority's approval at the following rate.

13.7 <u>Man-Day Rate For Eligible Extra Works</u>

Single average man hour rate, including overtime if any, and other site expenses and incidentals, including supervision, consumables, tools and tackles, will be Rs. 40/- (Rupees forty only).

No payment will be made if an item of work lasts less than 100 man-hours.

SECTION-14

SPECIAL CONDITIONS OF CONTRACT

14.0 Insurance

14.1 Marine, Storage cum Erection (MCE) Insurance and Repairing Damages

14.1.1
BHEL/client has an MCE insurance cover, inter-alia, for all the permanent project equipments/components supplied by BHEL under scope of this work by way of a transit and storage cum erection policy covering liability against damages/ losses etc.

14.2 Reporting Damages and Carrying out Repairs

14.2.1
Checking all components/equipments at siding/site and reporting to transporter and /or insurance authorities of any damages/losses will be done by BHEL.

14.2.2
Contractor shall render all help to BHEL in inspection including handling, re-stacking etc, assessing and preparing estimates for repairs of components damaged during transit, storage and erection, commissioning and preparing estimates for fabrication of materials lost/damaged during transit, storage and erection. Contractor shall help BHEL to furnish all the data required by railways, insurance company or their surveyors.

14.2.3
Contractor shall report to BHEL in writing any damages to equipments/ components on receipt, storing, and during drawl of the materials from stores, in transit to site and unloading at place of work and during erection and commissioning. The above report shall be as prescribed by BHEL site management. Any consequential loss arising out of non-compliance of this stipulation will be borne by contractor.

14.2.4
Contractor shall carry out fabrication of any material lost/damaged as per instructions from BHEL engineer.

14.2.5
BHEL, however, retains the right to award or not to award to the contractor any of the rectification/rework/repairs of damages and also fabrication of components.
14.2.6
All the repairs/rectification/rework of damages and fabrication of materials lost, if any, shall be carried out by a separately identifiable gang for certification of man-hours. Daily log sheets should be maintained for each work separately and should be signed by contractor's representative and BHEL engineer. Signing of log sheets does not necessarily mean the acceptance of these as extra works.
14.2.7

All rectification, repairs, rework and fabrication of components lost, which are minor and incidental to erection work (consuming not more than 100 man-hours on each occasion) shall be treated as part of work without any extra cost.

14.2.8
Insurance cover under this policy will generally be as per clauses 2.10.1 to 2.10.4 of General Conditions of Contract unless and otherwise specified differently in the Special Conditions.

14.2.9
In case the loss/damage is not attributable to the contractor, Payments of all extra works on account of repair / rectification / reworks of damages and fabrication of materials lost will be as per provisions of Section-13 of SCC.

14.2.10
In case the repairs/rectification/rework and fabrication of materials lost, the work has been done by more than one agency including the contractor, the payment towards extra charges will be on pro-rata basis and the decision of BHEL in this regard is final and binding on the contractor.

14.2.11
In case of theft / damage / loss of materials due to **repeated and continued instances of negligence/failure** attributable to the contractor, the expenses incurred on account of repair/ replacement of such components including BHEL's overhead expenses as applicable (presently @ 30%) in excess of the amount realized from the underwriters, if any, shall be recovered from the contractor. Recovery will be limited to Normal Deductible Franchise (DF)/Excess as per applicable Insurance (TAC) tariff guidelines for every incidence of loss/damage.

14.2.12
In case any insurance claim does not become tenable due to **willful** negligence/ damage/loss attributable to the contractor, the total cost of repair/replacement including BHEL overhead expenses shall be recovered from the contractor.

14.3 Insurance by the Contractor and Indemnification of BHEL

14.3.1
BHEL has taken a third party liability insurance, indicating in the proposal for such insurance that sub-contractors will be taking part in the erection work detailed in this tender. However, the bidder has to bear any expenses /consequences over and above the amount that may be reimbursed to BHEL by such coverage of third party liability insurance taken by BHEL.

Such additional liability will be to cover and indemnify BHEL and its customer of all liabilities which may come up and cause harm/damage to other contractors/customer/BHEL properties/ personnel or all or anybody rendering service to BHEL/ customer or is connected with BHEL/ customer's work in any manner whatsoever. The bidder's specific attention is also invited to clause 2.10 of General Conditions of Contract.

14.3.2

Contractor shall obtain suitable statutory as well as non-statutory insurance policies for all the properties belonging to him and also for his personnel deployed at project for execution of the contract work.

SECTION-15

Special Condition of Contract

15.0 Earnest Money Deposit & Security Deposit

15.1 EARNEST MONEY DEPOSIT :

Earnest Money Deposit for this tender will be Rs. 2,00,000/- (Rupees two lacs only).

One time EMD will also be Rs. 2 lacs.

EMD shall be deposited in cash (as permissible under income tax act), pay order or demand draft (payable at Nagpur in favour of 'Bharat Heavy Electricals Limited') only. **No other form of EMD remittance shall be acceptable to BHEL.**

EMD by the tenderer will be forfeited as per tender documents if

i) After opening the tender, the tenderer revokes his tender within the validity period or increases his earlier quoted rates.

ii) The tenderer 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.

EMD shall not carry any interest.

15.2 Security Deposit

15.2.1 Security Deposit should be collected from the successful tenderer. The rate of Security Deposit will be as below:

Sn	Contract value	Security deposit amount
1	Up to Rs. 10 lakhs	10% of contract value
2	Above Rs. 10 lakhs upto rs.50 lakhs	1 lakh + 7.5% of the contract value exceeding Rs. 10 lakhs.
3	Above Rs. 50 lakhs	Rs 4 lakhs + 5% of the contract value exceeding Rs. 50 lakhs.

The Security Deposit shall be remitted <u>before start of the work</u> by the contractor in the manner specified as follows.

15.2.2 Security deposit may be furnished in any one of the following forms

i) Cash (as permissible under the income tax act)

ii) Pay order, demand draft in favour of BHEL.

iii) Local cheques of scheduled banks, subject to realization.

iv) 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).

v) 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.

vi) 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.

vii) 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 remitted (either by cash/DD or BG **for maximum 50%** of total SD) before start of the work and the balance 50% may be recovered from the running bills.

EMD of the successful tenderer, excepting those who have remitted one time EMD, shall be converted and adjusted against the security deposit or specific request by the contractor.

The Security Deposit shall not carry any interest.

Note: acceptance of Security Deposit against Sl. No. (iv) and (vi) 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.

15.2.3

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

APPENDIX-I

DETAIL OF QUANTITIES

1. PIPING (Main Circulation Water Piping & CCW Piping under PGMA 80-468) =1150MT

2. PIPING (Drinking Water Piping under PGMA 80-478) and valves, supports etc. =15 MT

2. EQUIPMENTS SUCH AS, R.E. Joints, Butterfly valves, (eo & geared, manual, strainers etc) and other related valves =80 MT

3. SUPPORTS =10 MT

* The pipes will be supplied in standard length and these are to be cut at site as per layout/site conditions.

** Wherever the pipes are cut at site to suit the layout/ site condition, edge preparation shall be done at site.

Cutting and edge preparation for joints for air release, instrumentation tapings, and all smaller sizes shall be as per actual site routing and shall be done completely at site by the contractor.

Figures above are approximate and only indicative. These are furnished only as general indication and variations in these are likely. It is to be specifically noted that no claim whatsoever on account of any variation in these quantities shall be entertained by BHEL. Only the payment based on accepted item rate applied on respective actual quantity executed shall be made.

The standard pipe sizes of CW piping and CCW piping involved are having OD & thickness as 21.8X3.2 MM, 34.2X4.0MM, 48.8X4.0MM, 60.8X4.5MM, 89.5X4.8MM, 115X5.4MM, 166.5X5.4MM, 219.1X7.0MM, 273.1X7.0MM, 323.9X7.0MM, 355.6X8.0MM, 406.4X8.0MM, 457X8.0MM, 508X8.0MM, 610X8.0MM, 711X10.0MM, 813X10.0MM, 1224X12.0MM, 1422X12.0MM and 1626X14.0MM

APPENDIX-II

MAJOR TOOLS PLANTS AND MMD TO BE DEPLOYED BY THE CONTRACTOR

A: **TOOLS & PLANTS**

SL	DESCRIPTION OF EQUIPMENTS	CAPACITY	MIN. QTY
01	MOBILE CRAWLER CRANE	15 T	1 NO.
02	TRAILER WITH PRIME MOVER	20 MT	1 NO.
03	HYDRAULIC JACKS	100 MT	15 NOS
04	DEWATERING PUMP –VACUUM SUCTION, COMPLETE WITH MOTOR, STARTER, CABLES, SWITCHES ETC.	10 HP	AS PER REQUI'MENT
05	DEWATERING PUMP –VACUUM SUCTION, COMPLETE WITH MOTOR, STARTER, CABLES, SWITCHES ETC.	5 HP	3 NOS.
06	DEWATERING PUMP, COMPLETE WITH MOTOR, STARTER, CABLES, SWITCHES ETC.	1 HP	2 NOS.
07	CENTRIFUGAL PUMP WITH MOTOR, STARTER PANEL, CABLES BETWEEN STARTER PANEL AND MOTORS, INLET AND OUT LET VALVES FOR THE PUMPS FOR FILLING AND HYDRAULIC TESTING OF THE SYSTEM	150-200 TPH	2 SETS
08	HYDRAULIC TEST PUMPS COMPLETE WITH MOTOR, STARTER, CABLES, SWITCHES ETC - HIGH DISCHARGE CAP. – ABOVE 15 LIT/MIN		2 NOS
09	DISHED ENDS FOR HYD. TESTING OF PIPES/ ASSEMBLIES – REF CL. 4.7.6	Nb 1600 MM Nb 1400 MM Nb 1200 MM	2 SETS 2 SETS 2 SETS EACH
10	24 V TRANSFORMERS	24 V OUTPUT	4 NOS
11	WINCHES ETC	AS PER REQUIREMENT	
12	3 PH DISTRIBUTION BOARD WITH COMPLETE SET UP FOR DRAWL OF CONSTRUCTION POWER	600 AMP	2 NOS.
13	ELECTRIC CABLE FOR DRAWL & DISTRIBUTION OF CONSTRUCTION POWER	-	AS PER SITE REQMNT
14	RADIOGRAPHY ARRANGEMENT INCLUDING SOURCE	IR 192	2 SET

B: **MMD:**

AS PER SITE REQUIREMENT TO FULFILL FIELD QUALITY PLAN CHECKS.
NOTE:

1) THE ABOVE LIST IS NOT INTENDED TO BE EXHAUSTIVE. CONTRACTOR SHALL ARRANGE ALL THE T&P REQUIRED THOUGH NOT LISTED SPECIICALLY ACCEPTING THOSE PROVIDED BY BHEL.

2) ALL THE SMALL TOOLS & PLANTS ETC. HAVE TO BE PROVIDED BY THE CONTRACTOR.

APPENDIX-III

ANALYSIS OF UNIT RATE QUOTED

SL. NO.	DESCRIPTION	% OF QUOTED RATE	REMARKS
01	SITE FACILITIES VIZ., ELECTRICITY, WATER OTHER INFRASTRUCTURE.		
02	SALARY AND WAGES + RETRENCHMENT BENEFITS		
03	CONSUMABLES		
04	T&P DEPRECIATION & MAINTENANCE		
05	ESTABLISHMENT & ADMINISTRATIVE EXPENSES		
06	OVERHEADS		
07	PROFIT		
	TOTAL	100%	

DATE
SIGNATURE OF THE BIDDER

APPENDIX-IV

FORMAT FOR MONTH-WISE MANPOWER DEPLOYMENT PLAN
(CATEGORY-WISE NUMBERS TO BE INDICATED FOR EACH MONTH)

SL	CATEGORY ↓ MONTHS →	1	2	3	4	5	6 7	8	9	10	11	12	13	14	15	16
01	RESIDENT ENGINEER															
02	ERECTION ENGINEERS															
03	ERECTION SUPERVISORS															
04	QUALITY ASSURANCE ENGINEER															
05	SAFETY ENGINEER															
06	MATERIALS MANAGEMENT SUPERVISORS															
08	PIPE & OTHER WELDERS															
09	FITTERS															
10	CRANE OPERATOR															
11	TRUCK/TRAILER DRIVERS															
12	STORE KEEPERS															
13	ELECTRICIANS															
14	SEMISKILLED/ UNSKILLED WORKERS															
	MONTH WISE TOTAL															

SIGNATURE OF BIDDER

DATE:

APPENDIX–V

FORMAT FOR MONTHWISE DEPLOYMENT PLAN FOR MAJOR TOOLS & PLANTS

SN	DESCRIPTION & CAPACITY OF T&P ↓	MONTHS															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
01																	
02																	
03																	
04																	
05																	
06																	
07																	
08																	
09																	
10																	
11																	
12																	
13																	
14																	

SIGNATURE OF THE BIDDER
DATE:

APPENDIX-VI

CONCURRENT COMMITMENTS

SL. NO	FULL POSTAL ADRESS OF CLIENT AND NAME OF OFFICER IN-CHARGE	DESCRIPTION OF THE WORK	VALUE OF THE CONTRACT	COMMENC-EMENT DATE	SCHEDU-LED COMPLE-TION	% COMPL-TD. AS ON DATE	ANTICIPA-TED COMPLN. DATE	REMARKS

SIGNATURE OF THE BIDDER
DATE:

APPENDIX–VII

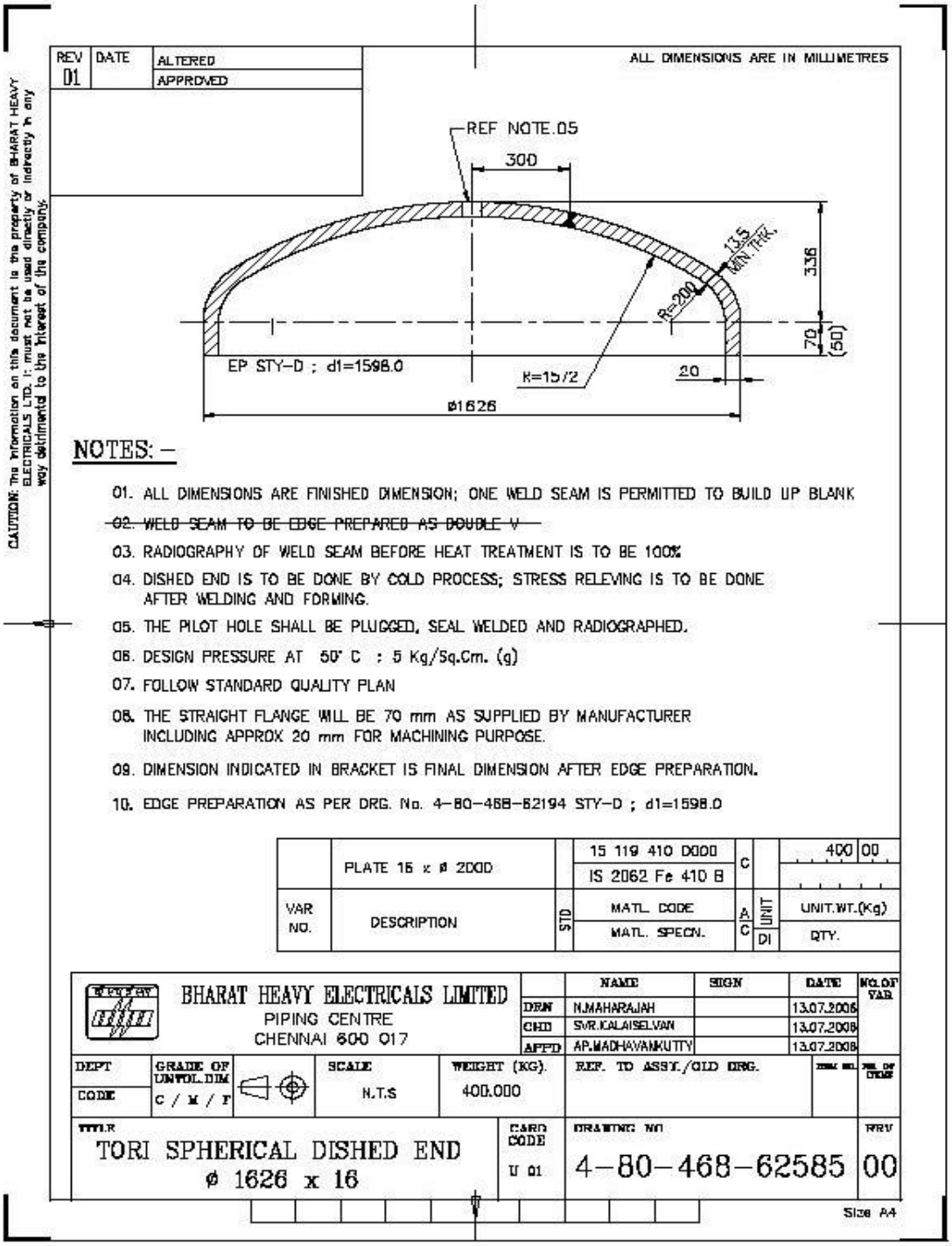
DETAILS OF WORK DONE DURING THE LAST SEVEN YEARS

SL. NO.	FULL POSTAL ADDRESS OF CLIENT & NAME OF OFFICER I/CHARGE	DESCRIP-TION OF WORK	VALUE OF CONTRACT	DATE OF AWARD OF WORK	DATE OF COMMENCEMENT OF WORK	ACTUAL COMPLETION TIME (MONTHS)	DATE OF ACTUAL COMPLETION OF WORK	REMARKS
1								
2								
3								
4								
5								

BIDDERS SHALL ENCLOSE COPIES OF DETAILED WORK ORDER (GIVING BIL L OF QUANTITIES AND SCOPE OF WORK) AND COMPLETION CERTIFICATE IN SUPPORT OF THIS STATEMENT.

DATE SIGNATURE OF TENDERER WITH SEAL

Sketch of Dished Ends for Circulating Water Pipeline of 2x125MW SLPP Mangrol Thermal Power Project.

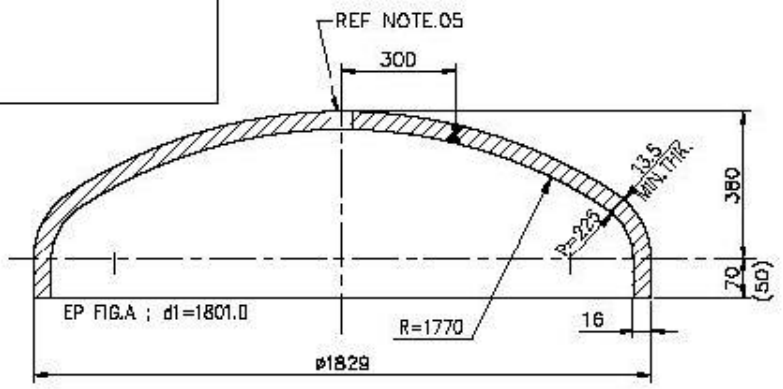


NOTE: THIS DRAWING IS GIVEN FOR REFERENCE PURPOSE ONLY. HOWEVER THE ACTUAL DRAWING WILL BE MADE AVALABLE LATER WITH CHANGED DISHED END DIAMETER.

Sketch of Dished Ends for Circulating Water Pipeline of 2x125MW SLPP Mangrol Thermal Power Project.

REV	DATE	ALTERED
01		APPROVED

ALL DIMENSIONS ARE IN MILLIMETRES



NOTES: –

01. ALL DIMENSIONS ARE FINISHED DIMENSION; ONE WELD SEAM IS PERMITTED TO BUILD UP BLANK
~~02. WELD SEAM TO BE EDGE PREPARED AS DOUBLE V~~
03. RADIOGRAPHY OF WELD SEAM BEFORE HEAT TREATMENT IS TO BE 100%
04. DISHED END IS TO BE DONE BY COLD PROCESS; STRESS RELEVING IS TO BE DONE AFTER WELDING AND FORMING.
05. THE PILOT HOLE SHALL BE PLUGGED, SEAL WELDED AND RADIOGRAPHED.
06. DESIGN PRESSURE AT 50° C : 5 Kg/Sq.Cm. (g)
07. FOLLOW STANDARD QUALITY PLAN
08. THE STRAIGHT FLANGE WILL BE 70 mm AS SUPPLIED BY MANUFACTURER INCLUDING APPROX 20 mm FOR MACHINING PURPOSE.
09. DIMENSION INDICATED IN BRACKET IS FINAL DIMENSION AFTER EDGE PREPARATION.
10. EDGE PREPARATION AS PER DRG. No. 4-80-468-62194 STY-D ; d1=1801.0

	PLATE 16 x ø2300		15 119 410 0000 / IS 2062 Fe 410 B	C		908	00
VAR NO.	DESCRIPTION	STD	MATL. CODE / MATL. SPECN.	A C	UNIT DI	UNIT WT.(Kg) / QTY.	

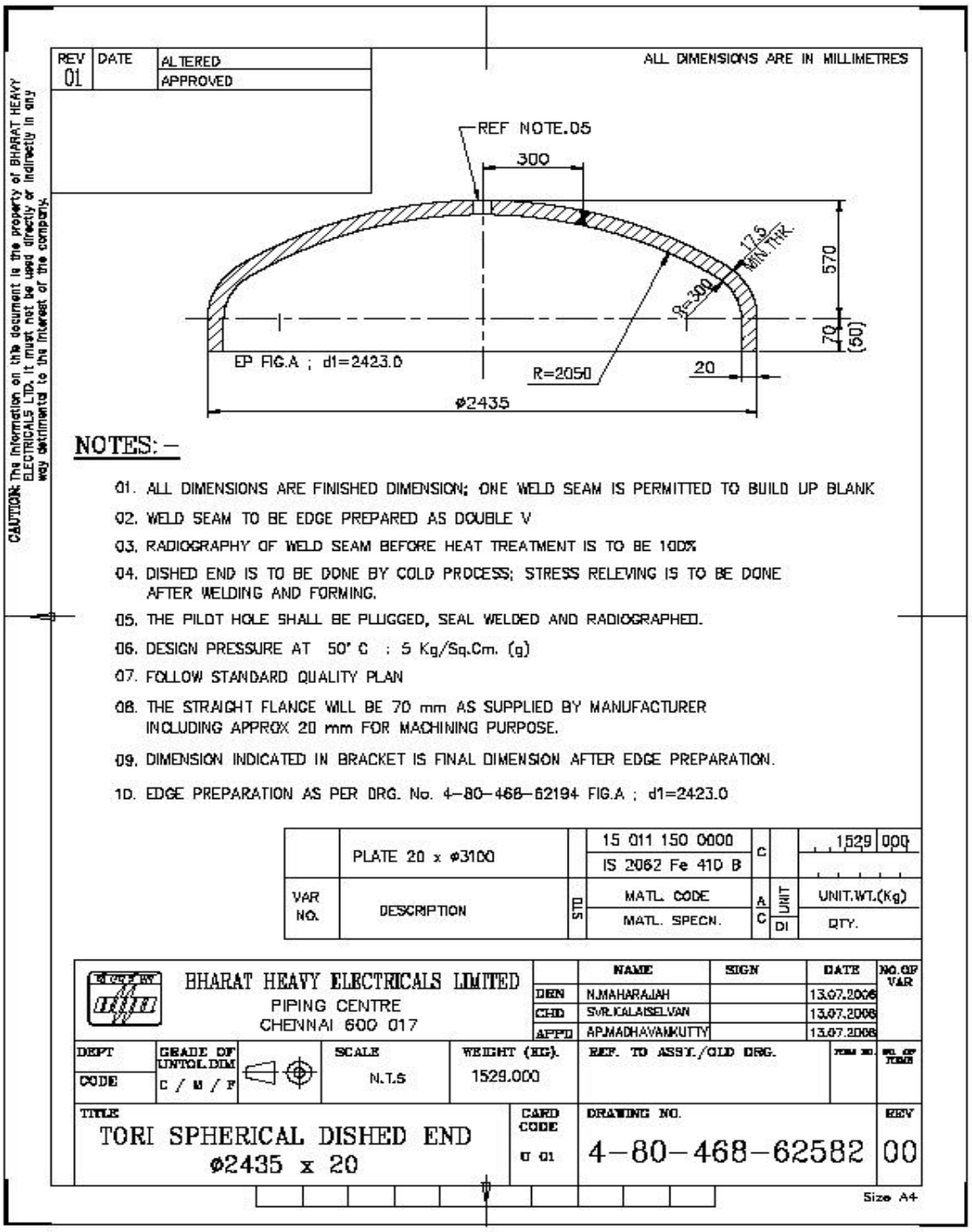
		NAME	SIGN	DATE	NO. OF VAR.
BHARAT HEAVY ELECTRICALS LIMITED PIPING CENTRE CHENNAI 600 017	DRN	N.NAHARAJAH		13.07.2008	
	CHD	SVR.KALAISELVAN		13.07.2008	
	APPD	AP.MADHAVANKUTTY		13.07.2008	

DEPT / CODE	GRADE OF UNTOL.DIM C / M / F	SCALE	WEIGHT (KG).	REF. TO ASSY./OLD DRG.
		N.T.S	908.000	

TITLE	CARD CODE	DRAWING NO.	REV
TORI SPHERICAL DISHED END ø 1829 x 16	U 01	4-80-468-62583	00

Size A4

NOTE: THIS DRAWING IS GIVEN FOR REFERENCE PURPOSE ONLY. HOWEVER THE ACTUAL DRAWING WILL BE MADE AVALABLE LATER WITH CHANGED DISHED END DIAMETER.



NOTE: THIS DRAWING IS GIVEN FOR REFERENCE PURPOSE ONLY. HOWEVER THE ACTUAL DRAWING WILL BE MADE AVALABLE LATER WITH CHANGED DISHED END DIAMETER

Bharat Heavy Electricals Limited: PSWR:Nagpur

P&I Diagram of Circulating Water Pipeline of 2x125MW SLPP Mangrol Thermal Power Project.