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

No. - BHE/PW/PUR/SKT- VERTICAL PKG/601

FOR

COLLECTION OF MATERIALS FROM BHEL/CLIENT'S STORES/STORAGE YARD; TRANSPORTATION TO SITE OF WORK; ERECTION; TESTING; ASSISTANCES FOR COMMISSIONING & TRIAL OPERATION; HANDING OVER AND ASSISTANCE FOR PERFORMANCE GUARANTEE TEST OF BOILER AND ITS AUXILIARIES, ESP, POWER CYCLE PIPING, INSULATION, CLADDING & APPLICATION OF FINAL PAINT ETC OF 2x250 MW (UNIT Nos. 3 & 4)

AT

SIKKA THERMAL POWER STATION
GUJARAT STATE ELECTRICITY CORPORATION LIMITED
DISTT- JAMNAGAR
GUJARAT

PART I

(TECHNICAL BID SPECIFICATION, NOTICE INVITING TENDER & GCC)

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

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LEGEND:

$: Included in Tender Specifications Part-I. Hosted in BHEL web page (www.bhel.com) as file titled **"NIT+GCC-601".**

@: Issued as separate hard copy booklet 'Tender Specifications Part-II (Price Bid-601)'. Hosted in BHEL web page (www.bhel.com) as file titled **"PRICE BID-601"**

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-601"**

BHARAT HEAVY ELECTRICALS LIMITED

(A GOVERNMENT OF INDIA UNDERTAKING)
POWER SECTOR - WESTERN REGION
SHREEMOHINI COMPLEX
345-KINGSWAY, NAGPUR 440 001

TENDER SPECIFICATION DOCUMENT ISSUE DETAILS

TENDER SPECIFICATION No. BHE/PW/PUR/SKT- VERTICAL PKG/601

NAME OF THE WORK: COLLECTION OF MATERIALS FROM BHEL/CLIENT'S STORES/STORAGE YARD; TRANSPORTATION TO SITE OF WORK; ERECTION; TESTING; ASSISTANCES FOR TRIAL OPERATION; HANDING OVER AND ASSISTANCE FOR PERFORMANCE GUARANTEE TEST OF BOILER AND ITS AUXILIARIES, ESP, POWER CYCLE PIPILINE, INSULATION, CLADDING & APPLICATION OF FINAL PAINT ETC OF 2x250 MW (UNIT Nos. 3 & 4)

AT

SIKKA THERMAL POWER STATION
GUJARAT STATE ELECTRICITY CORPORATION LIMITED
DISTT- JAMNAGAR
GUJARAT

EARNEST MONEY DEPOSIT: Please see Special Conditions of Contract.

LAST DATE FOR TENDER SUBMISSION: Please obtain updated information from web page "http://www.bhel.com" → Tender Notifications → View Corrigendums.

THESE TENDER SPECIFICATION DOCUMENTS CONTAINING **PART-I** AND **PART-II** ARE ISSUED TO:

M/s. ……

……

PLEASE NOTE:
THESE TENDER SPECS DOCUMENTS ARE NOT TRANSFERABLE.

For Bharat Heavy Electricals Limited

Dy. General 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 TENDERER MUST SUBMIT THEIR TENDERS AS REQUIRED IN TWO PARTS IN SEPARATE SEALED COVERS PROMINENTLY SUPERSCRIBED AS PART-I TECHNICAL BID AND PART-II PRICE BID AND ALSO INDICATING ON EACH OF THE COVERS THE TENDER SPECIFICATION NUMBER AND DUE DATE AND TIME AS MENTIONED IN THE TENDER NOTICE.

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 ENCLOSED IN A THIRD ENVELOPE (COVER-III) ALONGWITH REQUISITE EMD AS INDICATED EARLIER AND THIS SEALED COVER SHALL BE SUPERSCRIBED AND SUBMITTED TO ADDL. GEN MANAGER (PURCHASE) AT THE ABOVE MENTIONED ADDRESS ON OR BEFORE THE DUE DATE AS INDICATED.

THE QUALIFIED TENDERER WILL BE INTIMATED SEPARATELY ABOUT THE STATUS OF THEIR OFFER.

TENDERER ARE REQUESTED TO MAKE SPECIFIC NOTE OF THE FOLLOWING CONDITIONS:

CONTRACTOR SHOULD HAVE ADEQUATE RESOURCES INCLUDING MAJOR T&PS AT HIS DISPOSAL FOR THIS JOB.

CONTRACTOR SHOULD HAVE SOUND FINANCIAL STABILITY.

TENDERER 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 IF ANY, SHALL BE OBTAINED BY THE TENDERER 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.

TENDERER SHALL NOTE THAT THEIR OFFER WILL BE CONSIDERED SUBJECT TO THE APPROVAL OF BHEL'S CUSTOMER.

PROJECT INFORMATION

BACKGROUND

Sikka Thermal Power Station is presently having two sets (units) of 120 MW units in operating condition. The plant owner M/s Gujarat State Electricity Corporation Limited (GSECL) has undertaken expansion of this power plant by installing two units of 250 MW each (name plate rating) in the same premises. Though both the new units are of 250 MW name plate rating, they are guaranteed to produce an output of 270 MW each.

The Bidder shall acquaint himself by a visit to the site, if felt necessary, with the conditions prevailing at site before submission of the bid. The information given here in under is for general guidance and shall not be contractually binding on BHEL/ Owner. All relevant site data/information as may be necessary shall have to be obtained /collected by the Bidder.

LOCATION AND APPROACH :

In Sikka, Jamnagar district, Latitude 22^{O} 26' N & Longitude 69^{O} 49' E.

The site is surrounded by villages Mungai, Sikka, Gagva & Nanikkhavri of Jamnagar district of Gujarat state.

Access by Road:
It is connected to State Highway (SH-25) by a 5 km long road through Sikka village.

Access by Railways:
Jamnagar – Okha broad-gauge section is passing at a distance of 12 km form Sikka.

Nearest Airport:

Jamnagar

Nearest Seaport:

Okha & Navalakhinare located 140 Km & 130 Km respectively from the site.

Other Salient Information:

1. Owner — M/s GSECL
2. Owner's Consultant — M/s TCE, Bangalore
3. Project Title — 2x250 MW Sikka TPS Extension Units # 3 & 4
4. Location — 12 km from Sikka, District – Jamnagar, Gujarat
5. Nearest Railway Stn. — Jamnagar
6. Ambient Air Temperature
    a. Maximum — 42 Deg. C
    b. Minimum — 8 Deg. C
7. Relative Humidity
    a. Maximum — 100%
    b. Minimum — 21%
8. Rainfall
    a. Average annual — 650 mm
    b. Maximum — 900 mm
    c. Minimum — 400 mm
9. Wind Data
    a. Basic wind speed at 10m height — 50 m/sec
    b. Wind pressure — As per IS: 875 Part III
10. Seismic Zone — Zone IV as per IS: 1893-2002

CHECK LIST

(VIDE PARA 1.3 OF SECTION-I OF GENERAL CONDITIONS OF CONTRACT)

1	NAME OF THE TENDERER WITH ADDRESS		
2	NATURE OF THE FIRM	LIMITED / PARTNERSHIP / PROPRIETARY	
3	EMD DETAILS (Rs. 2.0 LACS BY DD ONLY OR ONE TIME EMD)		
4	VALIDITY OF OFFER (REQUIRED 6 MONTHS FROM TENDER OPENING DATE)		
5	MOBILIZATION TIME (NOT EXCEEDING 04 WEEKS FROM FAX LOI)		
6	WHETHER NO DEVIATION CERTIFICATE FURNISHED	YES	NO
7	TENDERER HAS VISITED THE PROJECT SITE AND ACQUAINTED WITH THE SITE CONDITIONS	YES	NO
8	DETAILS OF CONCURRENT JOBS ARE FURNISHED (AS PER RELEVANT APPENDIX)	YES	NO
9	HEAD QUARTER'S ORGANISATION IS FURNISHED	YES	NO
10	PROPOSED SITE ORGANISATION IS FURNISHED	YES	NO
11	FINANCIAL STATUS OF THE COMPANY (ANNEXURE 'A' OF GCC) IS FURNISHED	YES	NO
12	PROFIT & LOSS ACCOUNT FOR PRECEDING THREE YEARS IS FURNISHED	YES	NO
13	LATEST SOLVENCY CERTIFICATE FROM THE BANKER IS FURNISHED	YES	NO
14	LATEST INCOME TAX CLEARANCE CERTIFICATE OR COPY OF PAN CARD ACCOMPANIED BY 'IT RETURN' COPY IS FURNISHED	YES	NO
15	MANPOWER DEPLOYMENT PLAN (AS PER RELEVANT APPENDIX) IS FURNISHED	YES	NO
16	MONTHWISE DEPLOYMENT PLAN FOR MAJOR T&P (AS PER RELEVANT APPENDIX) IS FURNISHED	YES	NO
17	ANALYSIS OF UNIT RATES QUOTED (AS PER RELEVANT APPENDIX) IS FURNISHED	YES	NO
18	POWER OF ATTORNEY ENCLOSED IN FAVOUR OF PERSON MAKING OFFER.	YES	NO

19	DETAILS OF SIMILAR WORK DONE IN LAST SEVEN YEARS (AS PER RELEVANT APPENDIX) AND SUPPORTING DOUCMENTS FURNISHED.	YES	NO
20	PROGRAMME FOR THE SUBJECT WORK FURNISHED	YES	NO
21	BIDDER HAS FMILIARIZED HIMSELF WITH ALL RELEVANT LOCAL LAWS & CONDITIONS.	YES	NO
22	WHETHER ALL THE PAGES OF THE TENDER DOCUMENTS ARE READ, UNDERSTOOD AND SIGNED	YES	NO
23	WHETHER THE FOLLOWING DETAILS PERTAINING TO YOUR BANK ACCOUNT DULY ENDORSED BY THE BANK HAVE BEEN FURNISHED {TO ENABLE BHEL RELEASE PAYMENTS THROUGH ELECTRONIC FUND TRANSFER (EFT/RTGS) AS SPECIFIED IN SECTION 12 } 1. Name of the Company 2. Name of Bank 3. Name of Bank Branch 4. City/Place 5. Account Number 6. Account type 7. IFSC code of the Bank Branch 8. MICR Code of the Bank Branch NOTE: In case Bank endorsed certificate regarding above has already been submitted earlier, Kindly submit photocopy of the same	YES	NO

NOTE : STRIKE OFF YES OR NO, AS APPLICABLE

DATE : SIGNATURE OF TENDERER

DECLARATION BY BIDDER'S AUTHORIZED SIGNATORY

TENDER SPECIFICATION No. BHE/PW/PUR/SKT- VERTICAL PKG/601

I, HEREBY CERTIFY THAT ALL THE INFORMATION AND DATA FURNISHED BY ME WITH REGARD TO THIS TENDER SPECIFICATION ARE 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 AUTHORISED REPRESENTATIVE OF THE UNDERMENTIONED BIDDER AND A VALID POWER OF ATTORNEY TO THIS EFFECT IS ALSO ENCLOSED**.

DATE: SIGNATURE OF AUTHORIZED SIGNATORY WITH SEAL

CERTIFICATE OF NO-DEVIATION

TENDER SPECIFICATION No. BHE/PW/PUR/SKT-VERTICAL PKG/601

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 AND CLARIFICATIONS.

Signature of the Bidder

Date:

CERTIFICATE CONFIRMING BIDDER'S KNOWLEDGE ABOUT SITE CONDITIONS

TENDER SPECIFICATION No. BHE/PW/PUR/SKT-VERTICAL PKG/601

We, M/s ……

hereby declare and confirm that we have visited the project site as referred in BHEL's Tender Specification under reference above and acquired full knowledge and information about the site conditions. We further confirm that the above information is true and correct and we shall not be eligible for any additional payment of any nature due to lack of knowledge or non-familiarization of site conditions.

BIDDER'S NAME AND ADDRESS: ……..

PLACE:

DATE:

SIGNATURE & OFFICIAL SEAL OF BIDDER'S AUTHORISED SIGNATORY

SECTION-3

OFFER OF THE BIDDER

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

Dear Sir,
Sub: Offer against Tender Specification No. BHE/PW/PUR/SKT-VERTICAL PKG/601

I/we hereby offer to carry out the work detailed in the tender specification 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 listed 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 / forwarded herewith the requisite Earnest Money Deposit (EMD) 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, 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

SCOPE OF WORK

4.0 The work under the scope of these specifications is broadly as follows.

Collection of materials from BHEL/client's stores/storage yard; transportation to site of work; pre-erection checks, pre-assembly if necessary, erection, testing, assistances for commissioning & trial operation, handing over, assistance for performance guarantee test of Boiler and its Auxiliaries, Electrostatic Precipitator (ESP) Power Cycle Pipeline etc of unit nos. 3 & 4 of 2x250 MW Gujarat State Electricity Corporation Limited at Sikka, Distt. Jamnagar (Gujarat).

1) Following named systems are broadly in scope of the present contract:

i) Boiler supporting structures.
ii) Stairs, Platforms, Hand Rails, Toe Guards etc.
iii) Boiler pressure parts.
iv) Boiler trim & integral piping and mountings
v) Fuel oil Pumps & pipeline
vi) Non-pressure parts
vii) Rotating machines with their drives, lube oil system, approach platform, ladder/stair, canopy etc.
viii) Pulverised fuel pipeline (plain as well as ceramic lined) with special couplings.
ix) External structures (e.g. duct supporting, elevator structure etc).
x) Handling arrangements for rotating machines & other equipment.
xi) Power Cycle Pipeline.
xii) Low Pressure (Air & Water) Pipeline
xiii) HP by-pass system (Valves, Control Fluid system with pipeline).
xiv) De-aerating Heater & Feed Water Storage Tank with associated structures and platforms
xv) Electrostatic precipitator with stairways, galleries, roof & side cladding.
xvi) HP & LP chemical dozing systems.
xvii) Roof & Side Cladding (metapoly sheet) of Boiler & Elevator.
xviii) Insulation and Cladding.
xix) Appliaction of final paint on non-insulated surfaces.

For details of various sub-systems, please refer relevant Appendix. Please note that there is possibility of deletion or inclusion of some sub-systems with regatd to the scope of contract.

4.1 Scope of work is further detailed in various clauses hereinafter.

4.1.1 General requirements – common to all work

4.1.1.1
The intent of specification is to provide 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 execution of this work shall not relieve the contractor of the responsibility of providing such facilities to complete the work without any extra compensation.

4.1.1.2
The terminal points decided by BHEL should be final and binding on the contractor for deciding the scope of work and effecting payment for the work done.

4.1.1.3
The work shall be executed under the usual conditions affecting major power plant construction and in conjunction with numerous other operations at site. The contractor and his personnel shall cooperate with personnel of BHEL, BHEL's customer, customer's consultants and other contractors, coordinating his work with others and proceed in a manner that shall not delay or hinder the progress of work of the project as a whole.

4.1.1.4
The work covered under this specification is of sophisticated nature, requiring high quality workmanship, supervision, construction engineering & construction management. The contractor should ensure proper planning and successful & timely completion of the work to meet the overall project schedule. The contractor must deploy adequate quantity of tools & plants, modern / latest construction aids etc. He must also deploy adequate trained, qualified and experienced supervisory staff and skilled personnel.

4.1.1.5
Contractor shall erect and commission all the equipments and auxiliaries as per the sequence & methodology prescribed by BHEL depending upon the technical requirements. Availability of materials and fronts will decide this. BHEL engineer's decision regarding correctness of the work and method of working shall be final and binding on the contractor. No claims for extra payment from the contractor will be entertained on the ground of deviation from the methods / sequence adopted in erection of similar sets elsewhere.

4.1.1.6
All necessary certificates and licenses, permits & clearances required to carry out this work from the respective statutory/ local authorities are to be arranged by the contractor at his cost in time to ensure smooth progress of work.

4.1.1.7
The boiler shall be erected as per relevant provisions of latest Indian Boiler Regulations (IBR) and amendments/addendums thereof, if any.

4.1.1.8
The work shall conform to dimensions and tolerances specified in the various drawings / documents that will be provided during various stages 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 BHEL and recoveries will be effected from the contractor's bills towards expenditure incurred including cost of materials and departmental overheads of BHEL.

4.1.1.9
The contractor shall perform any services, tests etc, which may not be specified but nevertheless, required for the completion of work within quoted rates.

4.1.1.10
All necessary certificates and licenses required for carrying out this work are to be arranged by the contractor expeditiously.

4.1.1.11
The contractor shall execute the work in the most substantial and workmanlike manner. The stores shall be handled with care and diligence.

4.1.1.12
BHEL reserves right to recover from the contractor any loss which arises out of undue delay / discrepancy / shortage / damage or any other causes due to contractor's lapse during any stage of work. Any loss to BHEL due to contractor's lapse shall have to be made good by the contractor.

4.1.1.13
During the course of erection, testing and commissioning certain rework/ modification / rectification / repair / fabrication etc may become necessary on account of feedback / revision of drawing etc. This will also include modifications/ re-works suggested by BHEL / customer / other inspection group. 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 for such reworks. Claim of contractor if any, for such works will be governed by relevant clauses of Section-13 of SCC.

4.1.1.14
~~All works such as cleaning, levelling, aligning, trial assembly, dismantling of certain equipments / components for checking and cleaning, surface preparation, fabrication of structures, tubes and pipes as per general engineering practice and as per BHEL engineer's instructions at site, cutting, gouging, 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 within the quoted rates.~~

4.1.1.15
The contractor shall make temporary supports, jigs & fixtures, anchors for load and guide pulleys as required for the work. Contractor shall arrange necessary steel for such usage.

4.1.1.16
The contractor shall take delivery of the components, equipments, chemicals, and lubricants etc from the BHEL stores/ storage area after getting the approval of BHEL engineer on standard indent forms of BHEL. Contractor shall return the left over materials periodically and reconcile the detailed issue vis-à-vis consumption quantities of all such materials at regular intervals.

4.1.1.17
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. Contractor shall stack the materials neatly, preserve and store 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, same shall be done by contractor most expeditiously as incidental to work.

4.1.1.18
Plant materials should not be used for any temporary supports/scaffolding/ preparing pre-assembly bed etc.

4.1.1.19
The details of equipments to be erected under this contract are generally as per the schedule given in relevant appendices. 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 relevant erection documents which will be furnished to the contractor in due course of erection and the weight and quantity as per the relevant engineering documents will only be admissible for the billing purpose.

4.1.1.20
Hangers & suspensions, supports etc for tubes, piping, & ducts etc will be supplied in running / random lengths / sizes which shall be cut to suitable sizes and adjusted as required.

4.1.1.21
Spring suspension / constant load hangers may have to be pre-assembled for required load and erection carried out as per instructions of BHEL. Adjustments, removal of temporary arrests/locks, cutting of excess thread length of hanger tie-rod etc have to be carried out as and when required. Load setting of spring hangers, as per BHEL's documents/instructions, during various stages of erection & testing and after floating of piping/ducting during cold and hot condition will have to be done as part of work. This exercise may have to be repeated till satisfactory results are achieved.

4.1.1.22
Contractor shall lay/install the field-routed/small-bore pipelines to suit site condition/ requirement. Before laying/installing such pipelines, the contractor shall prepare

necessary sketch for routing these pipe lines and get the same approved by BHEL. Contractor must take care of the location/layout of other systems and equipment before preparing such sketch to avoid interference. There is a possibility of minor change in routing such pipelines even after completion of erection; contractor shall carry out the same without any extra cost to BHEL.

4.1.1.23
Welding of necessary instrumentation tapping points, thermo-well, thermocouple pad, metal temperature measurement (MTM) pad and clamps, root valve, condensing vessel, flow metering & measurement devices, and control valves to be provided on boiler & its auxiliaries and piping are covered within the scope of this specification. The installation of all the above items will be contractor's responsibility even if:

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

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

Pre-heating, NDE and post weld heat treatment for above shall be done as per the specifications as part of work.

4.1.1.24
Certain instrumentation like pressure switches, air sets, filters, regulators, pressure gauges, junction boxes, power cylinders, dial thermometers, flow meters, valve actuators, flow indicators, centrifugal/speed switches of motors, accumulators etc are received in assembled condition as integral part of equipments. Contractor shall dismount such instruments for calibration and hand over the same to BHEL. C&I erection agency of B HEL will do storage, re-erection and calibration etc.

4.1.1.25
Fixing and seal welding of thermo-wells & plugs before hydro test/ steam blowing of equipment or other piping system are within the scope of work. Contractor shall also remove the seal welded plugs by process of grinding and fix and seal weld thermo-wells after hydro test/steam blowing of lines as part of work.

4.1.1.26
Actuators/drives of valves, dampers, gates, powered vanes etc may have to be serviced, lubricated, before erection, during pre-commissioning & commissioning, including carrying out minor adjustments required as incidental to the work.

4.1.1.27
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. BHEL will provide the motorized insulation testers.

4.1.1.28
In installation of various equipments it may become necessary to install these on temporary supports/ hanger due to various reasons including non-availability of suspension materials. Contractor shall install such temporary suspensions/hangers

and later on shift the relevant equipments to their respective permanent hangers/ suspensions/ supports as incidental to work. Requisite materials for such temporary arrangements will be provided by BHEL on free-returnable basis which shall be returned to BHEL after the use.

4.1.1.29
The work shall be carried out strictly in accordance to the "Field Quality Plan" approved by BHEL/client. Contractor, jointly with BHEL, shall prepare all necessary records of measurements/readings/ protocols etc.

4.1.1.30
All works such as cleaning, levelling, aligning, trial assembly, dismantling of certain equipments / components for checking and cleaning, surface preparation, fabrication of sheets, tubes and pipes as per the general engineering practice and as per BHEL engineers instructions at site, cutting, weld disposing, grinding, straightening, chamfering, filing, chipping, drilling, reaming, scraping, lapping, fitting up etc as may be applicable in such erection works and which are treated incidental to the erection work and necessary to complete the work satisfactorily shall be carried out by the contractor as part of the work within the quoted rates.

4.1.1.31
Interconnection/ hook-up, if any, with the existing system shall form part of work. Such interconnections, hook-ups may require shut down of running plant and the relevant work have to be completed within such planned shutdowns. This may call for working with enhanced resources and on extended hours. Contractor's offer shall cover all such contingencies.

4.1.1.32
It may so happen that certain components like manhole doors, hanger etc may be supplied in loose items. They need to be assembled as per relevant drawings or as per advice of BHEL engineer prior to erection. This forms the part of the scope of work.

4.2 DETAILS OF SCOPE OF WORK FOR BOILER & AUXILIARIES & PIPING

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

4.2.1 Pressure Parts

A) Fabrication and installation of **temporary structure** for erection of Boiler Drum is in the scope of the contractor's work. BHEL will issue the required Structural Steel for this purpose free of charges. Contractor shall have to fabricate Built Up Beams and other structural members that are required for supporting the drum lifting equipment. Contractor shall erect, fasten, weld these structures and carry out NDE as per relevant codes and practices as part of work. After completion of drum erection activity, contractor shall dismantle these structures and return to BHEL stores. Contractor shall repair the areas of permanent equipment/ structures as well as Built-Up Structural Beams affected due to installation of temporary structures and finish as per relevant codes of practice or as instructed by BHEL. Payment for installation of temporary structures as aforesaid will be made at the

rate accepted for Structures; no separate payment will be made for fabrication, dismantling and finishing work and return of materials.

B) Pressure parts components like headers, panels, coils, loose tubes etc have to be flushed/blown with compressed air, checked for dimensional accuracy and configuration and minor rectifications, if necessary will have to be done before erection. This will involve making appropriate bed of steel structures over the concrete blocks/ steel pedestals. Necessary steel, concrete blocks shall be arranged by the contractor. Bed shall be fabricated as per BHEL requirement.

C) Normally the high pressure valves will have prepared edges for welding. But, if it becomes necessary, the contractor shall prepare new edges or recondition the edges by grinding or chamfering to match the corresponding tubes and pipes. No gas cutting will be permitted. All fittings like “T” pieces, weld neck flanges, reducers, etc shall be suitably matched with pipes for welding (this is applicable to piping work also).

D) Welding of all attachments on pressure parts including those required for insulation work is in the scope of work.

E) Surfaces inside seal box and other areas that are to be applied with castable refractory lining shall be painted with black bitumen paint before application of refractory. Seal boxes need to be partially cut open in order to pour refractory. Contractor shall carry out necessary cutting and subsequent seal welding of such cut-outs after setting of refractory. Contractor shall provide the black bitumen paint of required specification for such applications.

F) Furnace area and heat recovery area of flue gas passage has to be made leak proof by seal welding. Air leak test by pressurization has to be conducted to prove effectiveness of the seal weld and soap bubble or any other similar test will have to be carried out for the entire seal welds to ascertain the effective sealing is achieved. The tests may have to be repeated till satisfactory result is achieved.

G) If required, the pressure parts, after initial erection and tests, will have to be preserved by either dry or wet preservation procedure. Contractor shall erect the piping & valves and provide necessary assistance for the same. Required piping, valves and preservative (gas/chemicals) will be provided by BHEL as free issue.

H) The boiler drum internals, already installed at shop, shall have to be removed to facilitate inspection by statutory authorities and before chemical cleaning. The drum internals are to be preserved properly and re-fitted at appropriate stage as part of work.

I) Super-heater and/or re-heater system will have High Pressure butt weld joints of **T-91 material**. Welding of these HP joints shall involve pre-heating and post heating by resistance heating technique, argon purging of joints during welding process and full TIG welding. Contractor should follow required procedure for T-91 welding, NDE etc.

J) **Boiler drum**: BHEL will hand over the Boiler Drum duly unloaded and stacked on wooden sleepers at the unloading yard. Contractor shall transport the Boiler Drum

from the said spot to the cavity of boiler as required for its erection. Contractor shall make all necessary arrangements like arranging and laying of sleeper bed, steel structurals, steel plates & rails etc for transport of Boiler Drum.

Boiler Drum is to be erected using **strand & jack** method. Contractor may engage specialized agency to erect the Boiler Drum by this method. Contractor shall deploy the agency and other resources well in time to suit the milestone schedule.

K) Corrections in the profiles of scalloped plates/bars, skin casing, seal plates etc for proper matching with mating parts, wherever required, shall be done as incidental to the work.

4.2.2 Trim & Integral Pipeline of Boiler, Power Cycle Pipeline

4.2.2.1
The work on various piping systems will include cutting to required length, edge preparation, laying, fixing & welding of the pipes / elbows / fittings/ valves etc. In the pipeline, fixing & adjustment of supports / anchors / 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.

4.2.2.2
Tubes or pipes wherever deemed convenient, will be sent in random lengths. These shall be cut and edge prepared to suit the site conditions and the layouts. Fittings like bends tees, elbows, reducers, flanges etc will be supplied as loose items. However, bends of tube size up to Nb 65 mm will have to be formed at site as incidental to work.

4.2.2.3
All drains / vents / relief/ escape / safety valve exhaust piping etc to various tanks / sewage / drain canal / flash box / sump / atmosphere etc from the stubs on the piping and equipments are covered in the scope of work.

4.2.2.4
Connection (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, post-weld-heat-treatment if any, are also within the scope of work/specification. The terminal points work is inclusive of cutting of existing lines, if required, edge preparation, welding/ blanking and hook-up work.

4.2.2.5
It should be ensured that all the terminal point connections are done without transferring any undue load or strain to the connected equipment. Necessary log sheets have to be prepared for such fit-up along with BHEL/customer representative before connecting. All NDE including radiography of joints so made, post weld heat treatment if any, is also within the scope of work/ specification.

4.2.2.6
Mechanical freeness of valves has to be ensured prior to erection.

4.2.2.7
The above provisions shall be applicable, mutatis-mutandis, to other piping systems e.g. fuel oil piping, lube oil piping of rotating m/c, ACW lines etc.

4.2.2.8
Main Steam pipeline up to turbine including the strainer and terminal joint with turbine is included in the scope of work. The material will be SA-335 P-91. Bidder shall follow BHEL approved procedure for welding, pre heating, PWHT & NDT of SA-335 P-91 material. Detailed procedure will be issued to the contractor. The main steam pipeline between strainer and turbine does not undergo steam blowing, therefore this pipeline must be throwly cleaned of dust, scale, burr, any foreign materials and deposits by manual and mechanical cleaning method. Contractor shall take atmost care in the cleaning activity so as to ensure that no undesirable particle enters inside the turbine. Contractor shall obtain specific written clearance from BHEL before and after the cleaning activity.

4.2.2.9
Contractor shall take atmost care and work in co-ordination with BHEL's turbine erection egency to ensure that no undesirable stress/force/load gets tranfered to turbine or any other rotating machine that is connected to the pipelines in scope of this contract.

4.2.2.10 Following items of work shall also form part of piping erection:

1. Installation & removal of isolating devices/ NRVs and removal & re-fixing of internals required for hydraulic testing, pre-commissioning and commissioning activities. Required gaskets will be supplied by BHEL free of cost.

2. Matching of flanges for achieving parallelism and alignment resorting to heat correction or other suitable methods as per instructions of BHEL engineers.

3. To locate the cause of vibrations in pumps or other auxiliaries and to carry out necessary corrections in piping and its supports. This may involve cutting, fresh edge preparation, welding, radiography, stress relieving, etc. of suction, discharge, re-circulating and other connected piping and its supports at a number of places.

4. Fabrication and erection of racks and steel supports for all the piping including critical piping. Steel for this purpose will be supplied by BHEL.

5. Erection, welding, Heat Treatment and NDE of certain equipments like Flow Nozzles, Control Valves etc, after completion of certain activities e.g. Chemical Cleaning, Steam Blowing etc is part of work. This may involve removal of portions from the already erected pipelines in order to introduce these equipments and resultant edge preparation etc shall be incidental to work. BHEL will make payments for the fresh items on pro-rata basis; the contractual item rate as applicable for the concerned Pipeline shall be adopted for such payment. No separate/additional payment is envisaged for cutting and edge preparation in this regard. The removed pieces of pipes shall be returned to BHEL stores with proper cleaning, dressing and identification marking.

6. Welding of root valves with small length of pipeline to the pressure, flow and level tapping points on piping or flow nozzles / orifices / metering elements fixed on piping.
7. Opening of valve actuators, dismantling of actuators from the valves, refitting and rendering assistance connected with the electrical and mechanical problems.
8. Fixing and welding including due NDE & PWHT etc of carrier plates on to the pipes.

4.2.2.11
As far as possible pre-assy of piping on ground is to be done. The erection of various piping may have to be started from any random reference instead of the terminal points in order to meet milestone completion schedule.

4.2.2.12
The location of drain headers, valves, stations, steam traps of piping as indicated in the BHEL drawings are suggestive only. The final location and routings shall be decided to suit the site conditions. While routing such lines and fixing the stations, it has to be erected so as to provide easy accessibility and free path for the purpose of easy operation and maintenance. These locations shall be acceptable to the client. Sometimes, the locations of stations and routing of lines may have to be changed as per the site conditions. All such works shall be carried out expeditiously as per the instructions of BHEL engineer. The decision of BHEL engineer is final and binding on the contractor.

4.2.2.13
The contractual rates shall deem to be inclusive of pre-heating, welding, post heating, post weld heat treatment/ stress relieving and NDE of piping.

4.2.2.14
Erection of piping systems shall involve co-ordination with the erection of the turbine, turbo-generator, condenser, boiler, boiler feed pumps and other major equipments. Wherever required, approval of concerned BHEL engineer/other erection agency must be obtained prior to making piping interface connections to such equipments. Sequence of work shall be carefully planned to minimize interference with other groups working in the same area. Actual sequence to be followed shall be subject to the approval of BHEL. BHEL may direct the contractor to reschedule his work to suit the status of the site work.

4.2.2.15
While erecting the field- routed pipelines, the contractor shall check the accessibility of valves, instruments tapping points and maintain minimum headroom/access requirement and other necessary clearances from the adjoining work areas to avoid interference and congestion.

4.2.2.16
All pipelines shall be given proper slope towards the drain points during erection. For maintaining the slopes as given in the drawings for larger thickness and larger dia pipelines, edge preparation for welding may have to be altered suitably.

4.2.2.17

All pipelines shall be provided, as per the instructions of BHEL engineer, with suitable vent and the drain points with valve (s) at the highest and the lowest points respectively of the pipeline although they may not be specifically mentioned in the drawings.

4.2.2.18
It may become necessary to make & install temporary spool pieces for certain process requirements. Contractor's scope shall include preparation, erection, fit-up, welding, NDE etc and dismantling of such spool pieces at appropriate stage without any additional payment.

4.2.2.19
Normally, setting of hangers in cold condition is done by simulation adding additional temporary weight, which will be roughly equal to the weight of the insulation. Attachment of temporary weights and floating of the joints in the simulation test is to be treated as part of contractual work. Hanger settings may have to be repeated till free-floating joints are achieving. Hanger adjustments to be repeated for steam blowing by resetting hot and cold values if required. This may have to be repeated several times after steam blowing and synchronization. The weights will be supplied by BHEL. Contractor has to transport from BHEL stores and return the same after completion of work. No extra claim on this account will be entertained.

4.2.3 Rotating Machinery

A) Specifications covered under the following paragraphs and also other relevant specifications contained in other paragraphs elsewhere in this tender specification document will be applicable for rotating machines like FD / ID / PA fans, air pre-heaters, seal air fans, blowers, coal mills, fuel feeders, HP & LP dosing pump skids and other similar auxiliaries.

B) All lubricants for testing, preservation and lubricants for trial runs of the equipments shall be supplied by BHEL as free issue. All services including labour shall be provided by the contractor for drawing these from BHEL / customer's stores, transporting, handling, filling, emptying, re-filling, accounting and return of surplus lubricants / empty containers / old & used lubricants after draining etc. Contractor should clean the spilled / leaking lubricants thoroughly; consumables for such cleaning will be in contractor's scope.

C) All rotating machinery and equipments shall be cleaned, lubricated, checked for their smooth rotation, if necessary, by dismantling and re-fitting before erection. Also, the equipments may have to be checked for clearances, tolerances at any stage of the work including during testing, commissioning etc. Shaft of the rotating machines shall be rotated periodically to avoid damages. All these shall be part of work.

D) Trial run of the drives in un-coupled state and then coupled with equipment as to be done after necessary alignment.
Forced lube oil systems including lube oil piping of drives, rotating equipments etc form part of the work under these specifications. Hydraulic test of oil coolers, oil piping etc is in the scope of work. Where required cooler may have to be dismantled for hydraulic test and re-erected thereafter as part of work.

E) Certain rotating machinery, after testing, pre-commissioning may have to be re-aligned/hot aligned and vital clearances re-set. This may call for disconnection of cabling, removal of certain instruments etc and restoration at appropriate stage.
F) Protective lubricant coats / fill provided on / in the critical area of equipments have to remove at appropriate stage and regular lubricants, after removal / cleaning of protective coat / fill, as per specifications should be filled / applied. Cleaning / flushing agents / oils will be provided by BHEL.

G) Chemical cleaning, steam blowing and air drying of the connecting pipes for the lube oil system have to be carried out wherever required as per instruction manuals/drawings. Chemicals, suiting BHEL specification, for such chemical cleaning is in the scope of contractor.

H) Even though rotating machines may be grouted to foundation using non-shrink grout mix, blue matching of packer plates / shims with foundation / between packers / equipment base should be done as incidental to work wherever instructed by BHEL engineer.

J) Skid mounted equipments may need checking, re-setting due to various reasons as incidental to work.

K) There are six bowl mills for each boiler, all located in the mill & bunker bay between the boiler and the ESP.

4.2.4 Electrostatic Precipitator

4.2.4.1
Wherever called for, pre-assembly of supporting structures, casing walls have to be done, on ground.

4.2.4.2
Loading of collecting electrodes either from top or bottom, to be decided suiting site conditions, shall be done with due care as per instructions.

4.2.4.3
Straightness of all collecting electrodes has to be checked on ground prior to loading in to the field.

4.2.4.4
Bundle of collecting electrodes should be handled only with the set of special lifting beam & slings supplied by BHEL for the purpose.

4.2.4.5
Clearances as prescribed amongst collecting electrodes and with casing walls have to be maintained. Spot heating of collecting electrodes, wherever called for, shall be done as part of work to achieve the required clearances.

4.2.4.6
Erection, alignment/ fixing in final position, of high voltage rectifiers of ESP is in the scope of work. However testing & commissioning will be done by other agency.

4.2.4.7
Installation of high voltage interlocks (excepting rotary switch interlock of switchgear panels) is in the scope of work.

4.2.4.8
Complete erection, alignment, testing, pre-commissioning and commission etc for drive motors of collecting electrodes and emitting electrode rapping mechanism is in the scope of work.

4.2.4.10 **Air Leak Test**

After erection of ESP and before clearing for insulation, air leak test has to be carried out. Necessary equipment like, Air Blower, Ventury Meter and Instrument etc will be provided by BHEL. Handling such equipment at stores, transport, erection, commissioning and carrying out the leakage test, attending to the leakages till satisfactory sealing and demonstration of permissible pressure decay condition are in scope of the work. Contractor shall dismantle the test equipments and return to BHEL stores in good condition after due reconciliation, cleaning and servicing. No separate/ additional payment is envisaged for the same.

4.2.5 Main supporting structures, external structures, elevator structures, stairways, galleries & platforms, roofing and equipment handling arrangement

4.2.5.1
Boiler main supporting structures have to be erected in a sequential manner.

4.2.5.2
Quality norms with regard to verticality of column, inter-alia, have to be adhered to strictly, at various stages of erection.

4.2.5.3
Stiffening/strengthening of main supporting structure, if any, due to deviation in verticality of columns post drum lifting, shall be carried out, including fabrication, if any. Necessary steel for this will be provided in random sizes by BHEL as free issue. Payment for such stiffening/ strengthening shall be made for weight certified by BHEL engineer at the item rate applicable to structures, provided the deviation has occurred for the reasons not attributable to the contractor.

4.2.5.4
Each of the ceiling girders will be sent in 2 to 3 pieces which shall have to be assembled and welded. NDE & Post Weld Heat Treatment (Stress Relieving) shall be done on ground prior to their erection in position.

4.2.5.5
It is likely that, in deviation from prescribed sequence, erection of certain elements of structure may be deferred for later stage, to facilitate, say crane boom reach to higher elevation, passage of drum during drum lifting etc. This may necessitate temporary installation of some structural steels at appropriate locations to keep the stability of structure intact. Such temporary installations shall be removed subsequently and

returned to BHEL stores/ storage yard. Finishing work in the related permanent structures shall be done as per the instruction of BHEL engineer. BHEL will provide necessary steels on free issue basis in random sizes for such installations, which shall be fabricated by the contractor to suit the requirement.

Payment for such installations shall be made on the accepted tonnage rate of structures. No separate payment will be made for fabrication, removal & return of the materials to BHEL stores.

4.2.5.6
In some cases, the structural material will be supplied in random lengths, which have to be fabricated to suit the requirement as incidental to work. Also, it may sometimes be necessary to remove some of the erected members to facilitate erection of bigger/ pre-assembled equipments. In such cases, the removal and re-erection of such members as agreed by the BHEL engineer will have to be done by the contractor as incidental to work.

4.2.5.7
Contractor shall arrange materials required for temporary cat ladders & working platforms during erection of columns, platforms and other structural components. Such arrangements shall, as far as possible, be only of clamping & bolting type, as welding on columns etc will not be permitted. After the completion of work these shall be removed.

4.2.5.8
All the hand rails and toe guards shall be provided as per drawings and site requirement. Hand rails supplied in running lengths shall be suitably cut, edge prepared and welded. Also, hand rails/ guards may have to be provided from the safety point of view in certain places though not indicated in the erection drawings. The weld joints of hand rails shall be ground smooth to flush finish.

4.2.5.9
Galvanized electro-forged floor grills will be supplied for this project. These may have to be cut to suit requirement. Cutting shall be done only by mechanical cutters **and not by gas cutting**. Cold galvanizing compound is to be applied on the cut surface/edge. Cold galvanizing paint will be supplied by BHEL free of cost.

Fixing of floor grills shall be done by self-tapping screws (approximately 5.5 mm dia and 32 mm long) **and not by welding of studs.** Special purpose electrically operated hand tools are available in the market for this, which drills, taps and fixes the screws in a single operation. BHEL will supply the necessary self-drilling-cum-tapping screws and fixing clips. Contractor shall deploy the **drilling cum fixing machine** required for this purpose as a regular scope of work.

4.2.5.10
The contractor shall also install additional platforms of permanent nature for approaching different equipment as per the site requirement and to meet O&M requirements, though these may not indicated in the erection drawings. Materials required for such platforms will be supplied by BHEL in random sizes on free issue basis. These have to be fabricated to suit the requirement. Payment for erected weight

as certified by BHEL engineer shall be made at the rate applicable for structures. No payment is envisaged for fabrication of structures.

4.2.5.11
All relevant provisions as above shall apply, mutatis-mutandis, to the work of external structures, interconnecting structures, elevator structures, ESP stairways and galleries & equipment handling system etc.

4.2.6 Other products and systems and common requirements

A) The ducting covered under this scope of work is flue gas ducting up to boiler outlet flange, boiler outlet flange to ESP, ESP to ID fans, ID Fans to Chimney, hot and cold secondary air ducting from FD fans outlet up to wind box, hot and cold primary air ducting from PA fans to Coal Mills including interconnections, flow-meters, dampers/gates and their drives, supports and suspensions etc for these systems.

B) Ducts / expansion bellows (metallic & non-metallic) are normally supplied in loose components / segments and these are to be assembled and welded/ jointed at site before erection. The fabric portion of non-metallic expansion joints (NMEJ) namely bolster, fabric belt and canopy shall be installed by contractor under supervision/guidance of equipment supplier/BHEL for the first few cases. Contractor shall ensure that all subsequent NMEJ are assembled with due care and proper procedure. In similar manner all joints, connecting ducts, expansion pieces and dampers shall be seal welded. These welds have to be made leak proof and tested as per technical instruction / requirement.

C) Certain structural items like silencer supports, roof cladding structure, platform etc will be supplied in running lengths which shall be cut to required suitable sizes and adjusted/trimmed as part of work.

D) Contractor has to make canopies for motors, actuators, lube oil units, control valves, etc. Material for this will be supplied in random lengths / sizes. No separate payment for fabrication is envisaged. Only the erection tonnage rate applicable for structure will be paid for this work.

E) BHEL will supply **Metapoly Sheets** for roof and side cladding of Boiler and elevator structure. These sheets are to be fixed with self tapping screws (supplied by BHEL) in similar manner as in case of Galvanized floor grills. Contractor shall deploy the **drilling cum fixing machine** required for this purpose as a regular scope of work.

F) In case the ID fans are provided with variable frequency drive, Contractor has to erect & commission the mechanical components of the fan. Electrical/ Electronic Panels, transformers, cabling etc are not in this work specification. However in case of Hydraulic Coupling, the coupling shall be in scope of this contractor.

G) Actuators / drives of dampers, gates etc may have to be serviced, lubricated before erection, during pre-commissioning and commissioning, including carrying out adjustments required as incidental of the work.

H) All welded joints should be painted with anticorrosive paint/primer immediately after completion of all work. Necessary paints and other consumables for the above work are in the scope of the contractor.

I) Spring suspension / constant load hangers may have to be preassembled for required load and erection carried out as per instruction of BHEL. Adjustments, removal of temporary arrests / locks, cutting of excess thread length of hanger, tie rod etc, have to be carried out as and when required. Load setting of spring hangers, as per BHEL's documents / instructions, during various stages of erection and testing and after floating of piping / ducting during cold and hot condition will have to be done. This exercise may have to be repeated till satisfactory results are achieved.

J) Hangers and suspensions, support steels for ducts and other equipments, piping etc will be supplied in running/random lengths/ sizes, which shall be cut to suitable sizes and adjusted as required.

K) Touch up and preservative painting of all components issued to and/or erected by contractor shall form part of scope of work. The contractor shall arrange all paints, primer and consumables, T&P and facilities.

4.3 Preparations of foundations, Grouting of Various Equipment

4.3.1
Building foundations and other necessary civil works for supporting structures, equipments etc will be provided by BHEL / customer. The checking of dimensional accuracy, axes, elevation, levels etc, with reference to bench marks of foundations and anchor bolt pits have to be checked and logged by the contractor. The permanent benchmark / reference marks will have to be transferred to new locations with sufficient care to maintain the accuracy and protected / preserved with adequate care (to enable rechecking at later dates) as per BHEL instruction.

Minor adjustment of foundation level, dressing and chipping of foundation surfaces and blue-matching (wherever required) for of all equipments as per BHEL engineers instructions, should be done by the contractor as part of the work. Contractor/BHEL shall prepare protocols before taking over the foundations. Dressing and chipping of foundations up to 35 mm for achieving proper levels will be within the scope of work/specification.

4.3.2
All temporary foundations and anchor points required for installing erection equipments and winches, foundations for pumps, tanks etc are in the scope of contractor. All building materials like cement, steel including reinforcement bars, grits cements etc for such temporary foundations shall have to be arranged by the contractor within the quoted rates. All such foundations shall be demolished and normal ground conditions restored after the usage.

Neutralisation pit required for EDTA cleaning process is to be made by the contractor. After completion of cleaning process the pit has to be dismantled and area is to be backfilled, compacted and levelled before handing over of area to owner.

Effluent of the EDTA cleaning process is to be disposed off safely from neutralising pit to safe areas as per instruction of BHEL/Owner.

4.3.3
Contractor shall carry out scrapping and blue matching of embedded plates/ packers of rotating equipments. Chipping and the levelling of concrete surfaces, fine dressing up to the extent required to obtain contact between packer and concrete, is also covered in the scope of this work. Scrapping, chipping and matching shall be done so as to achieve prescribed percentage of contact between the two surfaces.

4.3.4
BHEL will provide free of cost only the shims and packer plates (either machined or plain) which go as permanent part of the equipment. Certain packer plates and shims over and above the quantity received as a part of supplies from manufacturing units of BHEL will have to be cut out from steel plates / steel sheets at site to meet site requirement. Contractor shall cut and prepare packers and shims by gas cutting / chiselling / grinding and de-burr the same. However, machining of the packers wherever necessary shall be arranged by contractor.

4.3.5
Complete grouting of structures equipments, including anchor/ foundation bolts, beneath base, base hollows etc, as may be applicable, is included in the scope of contractor. Arranging all labour, building materials including cement, ordinary Portland as well as quick setting – free flow - non-shrink grout mix (e.g. Conbextra GP1/GP2), form work, shuttering, and any other requirements is in the contractor's scope. Contractor shall obtain approval of BHEL for cement (ordinary Portland as-well-as quick setting – free flow- non-shrink grout mix) prior to use. Cleaning of foundation surfaces, pocket holes and anchor bolt pits, making them free of oil, grease, sand and other foreign materials by soda washing, water washing & de-watering and blowing with compressed air or any other methods approved by BHEL are within the scope of this specification/work.

4.3.6
After the grouting has finally set and cured, alignment of equipments involved shall be checked again to verify for any disturbance or any other reason. If required, de-coupling of equipments has to be done for conducting the verification. In case any disturbance is noticed the cause, if any, shall be removed and re-alignment done as part of work.

4.4 Welding, Radiography and Other Non-Destructive Testing, Post Weld Heat Treatment

4.4.1 Welding

4.4.1.1
Installation of equipment involves good quality welding, NDE checks, post weld heat treatment etc. Contractor's personnel engaged should have adequate qualification on the above works.

4.4.1.2
The method of welding (viz) arc, TIG or other method will be indicated in the detailed drawing/documents. BHEL engineer will have the option of changing the method of welding as per site requirement.

4.4.1.3
Welding of high pressure joints shall be done by IBR certified & authorized high pressure welders who have been permitted by the Chief Inspector of Boiler (CIB) of state concerned for deployment at the site of work.

4.4.1.4
Welding of all attachments to pressure parts, piping shall be done only by the qualified and approved welders.

4.4.1.5
Before any welder is engaged on work, he shall be tested and qualified by BHEL/ customer, though they may possess the IBR/other certificate. BHEL reserves the right to reject any welder without assigning any reason. All the expenditure in testing/qualification of the contractor's welder shall be borne by contractor.

4.4.1.6
Unsatisfactory and continuous poor performance may result in discontinuation of concerned welder.

4.4.1.7
The welded surface shall be cleaned of slag and painted with primer paint to prevent rusting, corrosion. For this consumables like paint /primer etc will be in the contractor's scope.

4.4.1.8
HP joint fit-up, should be protected, where required, by use of tapes/protective paint as may be prescribed by BHEL. The contractor shall arrange consumables like protective paints/tapes etc.

4.4.1.9
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 the BHEL engineer regarding acceptability of the welds shall be final.

4.4.1.10
In the case of P-91 pipe welding, contractor shall deploy welders qualified for welding of P-91 material. The welders engaged by contractor if not qualified for P-91 welding will be trained by BHEL at BHEL welding research institute (WRI) Trichy and allowed to work only after passing the required test arranged by BHEL. All the expenditure towards such qualification including cost of training, travelling expenses, stay etc., shall be borne by the contractor.

4.4.1.11
Joint fit up will be a stage of inspection. Where required, joints shall be offered for visual inspection after root run. Subsequent welding should be made only after the approval of root run.

4.4.1.12 Socket Welding:

In execution of this work, considerable number of socket weld joints is involved. The exact quantity of such socket welds or probable variation in the quantum cannot be furnished. The bidder shall take notice of this while quoting as no extra claim on this account will be entertained. The socket welding on hp parts/ hp piping shall be done by the IBR qualified welders. Contractor has to adhere to the procedures/ specification as indicated in the drawing for socket welding.

4.4.1.13
Welding electrodes have to be stored in enclosures having temperature and humidity control arrangements. This enclosure shall meet BHEL specifications.

4.4.1.14
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.

4.4.2 HEAT TREATMENT:

4.4.2.1
For the purpose of temperature recording of stress relieving process, thermocouples have to be attached to the weld joint. The number of temperature measuring points and locations shall be as per the standards of BHEL. Thermocouples have to be attached using capacitor discharge type portable thermocouple attachment unit. Contractor shall arrange sufficient number of thermocouple attachment units.
4.4.2.2
Contractor should provide temperature indicator / temperature recorder for measuring temperature during pre-heating for welding or for controlling temperature of metal for hot correction etc. The temperature recorders should be preferably of solid state type.

4.4.2.3
Heat treatment may be required to be carried out at any time (day or night) to ensure the continuity of the process. The contractor shall make all necessary arrangements including labourer required for the same as per directions of BHEL.

4.4.2.4
In certain cases only the pre-heating of weld joints may be called for.

4.4.2.5
For weld joints of heavy structural sections, if heat treatment is required, the same shall be carried out as part of the work.

4.4.2.6
Checking effectiveness of stress relieving by hardness tests (by digital hardness tester or other approved test methods as per BHEL engineer's instruction) including necessary testing equipments is within the scope of the work / specification.

4.4.2.7
Preheating, inter-pass heating, post weld heating and stress relieving after welding are part of erection work and shall be performed by the contractor in accordance with BHEL engineer's instructions. Where the electric resistance heating method is adopted contractor shall make all arrangement including heating equipment with automatic recording devices, all heating elements, thermocouples and attachment units, graph sheets, thermal chalks, & insulating materials like mineral wool, asbestos cloth, ceramic beads, asbestos ropes etc, required for all heating and stress relieving works.

4.4.2.8
All the recorded graphs for heat treatment shall be handed over to BHEL/IBR authorities and due clearances obtained.

4.4.2.9
During welding & post weld heat treatment of main steam piping (P-91 material), the induction heating process shall continue un-interrupted. Therefore, contactor shall arrange back-up dg set to take care of power interruptions during the process.

4.4.2.10
Results of these processes shall be verified/ validated as per requirements of BHEL/client.

4.4.3 NON DESTRUCTIVE EXAMINATION:

4.4.3.1
Contractor shall provide all resources and make all arrangements for the radiographic examination of welds for this work. For reasons of safety, invariably the radiography work will be carried out after the normal working hours and close of other site activities only. In this regard, the contractor has to adhere to the safety rules / regulations laid by BARC authorities from time to time.

4.4.3.2
Radiography inspection of welds shall be performed in accordance with requirements and recommendation of BHEL engineer. The minimum quantum of radiographic inspection shall be as per provision of IBR/BHEL's erection documents. They may, however be increased depending upon the performance of the individual welder at the discretion of BHEL engineer/boiler inspecting authority. Bidder shall also arrange the UT equipment with recording facility at his own cost. Usage of UT equipment shall be as per direction of BHEL engineer. Records of UT shall be produced as per site requirement.

4.4.3.3
All x-ray / gamma ray films of weld joints shall be preserved properly and be handed over to BHEL/IBR authorities and requisite clearances shall be obtained by the contractor.

4.4.3.4
The field welded joints shall be subject to dye-penetration/MPT/RT/ other non-destructive examination as specified in the respective engineering documents/ as instructed by BHEL.

4.4.3.5
Where required, surface preparation, like smooth grinding of welded area, prior to radiography shall be done. It may also become necessary to adopt inter-layer radiography/MPT/UT depending upon the site/ technical requirement necessitating interruptions in continuity of the work and making necessary arrangements for carrying out the above work. The contractor shall take all this into account in his offer. The required NDE method/procedure will be decided by BHEL engineer at site.

4.4.3.6
The percentage of radiography test will be based on BHEL's standard practice/code requirement. Bidder shall note that the percentage shall be suitably increased in case the concerned welders' performance is found inconsistent/unsatisfactory by BHEL. In the event of continued/prolonged unsatisfactory performance, the concerned welder shall be withdrawn forthwith from any further welding work. He may however be re-inducted later after going through fresh qualification tests in accordance
The defects shall be rectified immediately and to the satisfaction of BHEL engineer. The decision of BHEL engineer regarding acceptance / rejecting the joints will be final and binding on the contractor.

4.4.3.7
100% radiograph of certain sizes in piping have to be taken as per relevant codes of practice / BHEL drawings.

4.4.3.8
For carrying out ultrasonic testing of welding joints of large size tubes and pipes, it will be necessary to prepare surface by grinding and buffing to obtain a smooth finish and contour as necessary. The contractor's scope of work includes such preparation as incidental to work.

4.4.3.9

After stress relieving 5% of UT for all critical lines and 2% of UT for other alloy steel lines to be taken to ensure soundness of joints particularly stress relieving cracks. No separate payment will be made.

4.4.3.10
Contractor has to undertake radiography test (RT) of weld joints with Iridium-192 isotope camera. However, for any reason, RT does not become possible then such joints shall be tested by Ultrasonic Test (UT). Contractor has to deploy Level–2 certified operator for conducting RT as well as UT.

4.4.3.11
In the case of P-91 piping wherever radiography is not possible, Ultrasonic Test has to be carried out apart from other NDE.

4.4.3.12
For pipes with wall thickness less than 25 mm, no radiography plugs will be provided. Radiography shots to be taken by double wall technique or any other method to be adopted in consultation with BHEL engineer at site.

4.4.3.13
No separate item rate payment for NDE activities, except for Radiography Test, is envisaged. For radiography test, payment will be made based on the accepted item rate on certified measurement. Certified measurement shall be for the accepted weld joints and not for the ones having any weld/workmanship defects.

4.5 LINING AND INSULATION

Application of insulation, finishing, cladding and outer casing etc of the following:

1. Main Boiler
2. Boiler Auxiliaries including ESP.
3. Pipelines, Tanks & Vessels.
4. Other Equipment including BOIs, though not listed above but required for completion of any system in scope.

4.5.1
The work shall conform to dimension and tolerances specified in the various drawing and documents that will be provided during the execution. If any portion of the work is found to be defective in workmanship or not conforming to drawings or other specifications, 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 or departmentally and recoveries will be deducted from contractor's bills towards expenditure incurred including 30% departmental charges.

4.5.2
The terminal points as decided by BHEL shall be final and binding on the contractor.

4.5.3
All insulation and refractory materials including iron components and outer sheet casing materials, cladding sheets etc required will be supplied by BHEL and the same have to be erected/ applied as per the drawings and specifications of BHEL by the contractor.

4.5.4
The contractor shall provide the required quantity of wire, nails, and planks for formwork and other materials for shuttering and curing works.

4.5.5
Contractor shall observe all precaution for laying, curing etc of pourable insulation. The contractor at his own cost shall redo any defective works found.

4.5.6
Wool insulation is received at site as loose bonded mattresses in standard sizes. These are to be dressed/cut to suite the equipments. Multiple layers of wool have to be applied as directed and as per drawings and specifications for all equipments/ systems covered under the scope of work.

4.5.6
Cutting & dressing of insulation bricks to suit the site area of application is incidental to work.

4.5.7
Removable type of insulation has to be provided for valves fittings, expansion joints etc as per drawing or as directed buy BHEL engineer.

4.5.8
The cladding and outer casing are aluminium sheets. All relevant specifications and procedures with regards to beading, sealing etc for aluminium sheets have to be adhered to.

4.5.9
Cladding/outer casing shall be fixed expeditiously, so as to avoid damage to the insulation from the weather.

4.5.10
The overlapping surface of outer casing/cladding sheet shall be coated with sealing compound, which will be supplied by BHEL free of cost.

4.5.11
To take care of bimetal corrosion due to variety of metals in contact of each other viz retainer to support, support to outer casing/cladding, cladding-to-cladding etc, suitable paints specified by BHEL, to be applied and/or neoprene rubber packing/ strips or any other insert may have to be fixed as required.

4.5.12
The contractor shall leave certain gaps and openings while doing the work as per the instructions of BHEL engineer to facilitate inspection by boiler inspector or during commissioning to fix gauges, fittings, instruments etc. These gaps will have to be finished as per drawings at later date by the contractor at his cost.

Contractor shall cut open works in needed as per BHEL engineer’s instructions during commissioning for inspection, checking and make good the works after inspection is over without any extra payment.

4.5.13
A log book shall be maintained by the contractor for the clearance of the area for application of refractory and insulation. Where the contractor dose the work on his own accord without prior permission, such work should be re-done at his own cost.

4.5.14
Wastage allowances for the material issued are envisaged as follows:

A	Pourable & Castable insulation	-	2%
B	Insulation bricks and motor	-	2%
C	Wool mattresses	-	2%
D	Cladding sheets	-	2%

The wastage allowance will be applicable on the net issued quantity i.e. Total quantity issued reduced by the quantity returned to stores as unused/fresh item. Contractor shall reconcile the material issues periodically as prescribed by BHEL site. Payment for the done will be regulated as per provision of Section –12.

4.5.15
The following works are also included in the scope of this contract.

Cutting of cladding sheets as per the profile of the equipment and painting on inner surface with two coats of bituminous paint. Paint will be supplied by BHEL free of cost.

Cutting of the wool mattresses to the required shape and application of finishing cement of required thickness wherever required.

4.5.16
Insulation work of temporary piping for alkali boil out, steam blowing and chemical cleaning has to be carried out at site. The same have to be removed and returned to the BHEL stores after the completion of activity. Rates quoted for application of wool for boiler and auxiliaries will be applicable for this work also. No separate payment will be made for removal of temporary insulation and return of the same to BHEL stores/yard.

4.5.17
In certain instances, co-coordinated/phased application of castable refractory/ insulation on pressure parts etc may be necessitated in consideration of sequence of activities of other erection agencies. Contractor shall do such phased work as may be directed by BHEL.

4.5.18
Prior to application of refractory bituminous painting on the pressure parts and other area is under contractor scope. Only the bituminous paint will be supplied by BHEL free of cost. No separate payment will be made for application of paint.

4.6 PAINTING

4.6.1
Components of the Boiler & Auxiliaries will in general be supplied by BHEL with one coat of Primer and two coats of finish paint applied at the manufacturing shop; contractor shall apply one coat of finish paint on all such components (which are not insulated) after erection at site unless and otherwise the shop coating is damaged in the meanwhile. Following types of paints shall be used for this project.
1) Structure: Chlorinated Rubber
2) Safety Valves and their exhaust pipes: Heat Resistant Aluminium
3) Equipments: Epoxy / Chlorinated Rubber

4.6.1
In addition to components/equipment as above, there could be limited few without any prior protective coating. Such components shall first be thoroughly cleaned of all dirt, rust, scale, grease, oil and other surface deposits by wire brushing, scraping, washing, wiping with solvent or any appropriate method and the same being inspected and approved by BHEL followed by application of one coat of primer. Afterwards, the above parts shall be over-coated with two layers of **Chlorinated Rubber** paint as per application procedure prescribed by the paint manufacturer.

4.6.2 Touch-up painting on damaged areas -

a) For coatings damaged up to metal surface

Surface preparation shall be carried out by manual cleaning. Minimum 6 inches adjoining area with existing coating shall be roughened by wire brushing, emery paper rubbing etc., for best adhesion of patch primer.

4.6.3
Painting of site-welded areas / painting of areas exposed after removal of temporary supports / touch-up painting on damaged areas of employer's structures, where inter-connection, welding / modification etc has been carried out by the bidder.

(a) Clean the surface to remove flux spatters and loose rust, loose coatings in the adjoining areas of weld seams by wire brush and emery paper.

(b) Painting procedure to be followed as mentioned above for touch-up painting on damaged areas.

4.6.4
The scope of work includes painting of colour bands, lettering, marking and signs for direction of flow/rotation, names etc of approved colours as per the standard colour codes and specifications specified in tender specification or as advised by BHEL/ customer engineer at site for the equipments/components covered in these specifications.

4.6.5
In certain isolated instances where it is not possible to clean the equipments as explained above, cleaning by grinding might have to be resorted to. No damage to the equipment/components should be caused.

4.6.6
Surface to be painted should be free of oil and grease. It should be removed by using suitable cleaning agents including permitted solvents. Surface cleaned by chemical agent, if required, shall be treated further as prescribed in use of such cleaning agents. The contractor at his own cost shall provide all the consumables and application implements.

4.6.7
During the preparation of surface, if the shop coat is damage by chemical cleaning or by mechanical means, contractor shall repair the same free of cost to BHEL. BHEL will make available only the primer and paints free of any charge to contractor.

4.6.8
Specified drying time shall be permitted from one to another coat.

4.6.9
This work requires working at higher altitudes from ground level to as high as 60 m and more. The work spread is also substantial involving substantial run of structures and piping. Contractor shall take sufficient precautions to ensure safe and hazard-free working condition. The ropes, ladders, scaffolding materials, clamps etc and climber used should be of appropriate quality for safe and smooth execution of work.

4.6.10
Contractor shall carry out the work in such a way that other erected equipment, structure, civil foundations and other property are not damaged. For damages in any of such cases due to lapses by contractor, BHEL shall have the right to recover the cost of such damages from the contractor.

4.6.11
Contractor shall take due care to cover/protect the equipment which are already painted while carrying out the painting of other adjacent equipment. If so happens, it shall be cleaned and repainted by the contractor without any extra charges.

4.6.12
In general, painting of structural parts and colour bands, lettering, marking of direction of flow/rotation etc will be carried out by brush painting. However, areas/equipment inaccessible for manual painting have to be painted by spray painting. The decision of BHEL engineer, in this regard, shall be final and binding on the contractor. For the purpose of spray painting, service air at one point will be made available by BHEL free of cost. Laying of air pipeline, hose and any other line required shall be done by contractor at his cost. The contractor shall provide spray equipment set.

4.6.13
The contractor shall provide all the necessary scaffolding materials, temporary structures and necessary safety devices etc, during execution of the work.

4.6.14
Final painting work shall be started after obtaining clearance from BHEL engineers and as per his instructions.

4.7 Testing, Pre-Commissioning, Assistance for Commissioning

4.7.1
Testing, pre-commissioning and assistance for commissioning will involve, though not limited to these, various testing e.g. Hydro-static pressure, pressure decay tests, leak test, trial runs of equipments; flushing by air, water, oil, steam as applicable; checking/ setting various clearances/parameters, ensuring operation of various equipments free of undue restrictions, chemical (EDTA) cleaning of boiler, steam blowing of the boiler and the critical piping, floating of safety valves, coal firing, trial operation and loading etc are some of these activities. All the activities for commissioning of the set, as informed by BHEL from time to time shall be completed.

4.7.2
All these tests should be repeated till all the equipments satisfy the requirement / obligations of BHEL to their client and also the relevant statutory authority.

4.7.3
Contractor shall lay / install necessary temporary piping, pumps, valves, blanks, gauges, cables, switches etc for conduct of hydraulic / pressure test, chemical cleaning, steam / air blowing etc. This may involve cutting of some portion of existing piping / valves, placing of rubber wedges / blanks in the valves and other openings, fabrication and installation of temporary tanks for chemical mixing, temporary access platforms to mixing tanks etc. Where required, bends have to be fabricated / formed at site from random length / size of pipes / structural steel. Temporary installation itself has to be tested, tried, and subject to non-destructive examinations as per the instructions of BHEL as part of work**.**

No payment will be made for temporary installations made for hydraulic testing of various systems & piping. Similarly no payment will be made for electrical installations made for any temporary system.

4.7.4
All materials, equipments necessary for installation of temporary system as above will be supplied by BHEL as free returnable issue in random sizes / lengths. However, servicing, fabrication, erection, dismantling of the same after completion of the process, and handing over back to BHEL stores will be the responsibility of the contractor.

In accounting of materials following wastage allowances are provided:

1. Structural items : 5%

2. Pipes : 3%

No wastage allowance for valves & other equipments.

4.7.5
Fabrication, fit-up, pre-heating, welding, post-weld heating and post-weld-heat treatment if any, of requisite blanks for conduct of hydraulic test / leakage test is part of work. Similarly, removal of blanks, restoration and normalization of the concerned system / line is to be done as part of work. BHEL will provide the material for blanks free of charge. No separate payment is envisaged for these activities.

4.7.6
Overhauling, cleaning, servicing of tanks, pumps, equipments, valves, during erection and commissioning stages are in the scope of work. Gaskets, packing & spares for replacement will be provided free of charges by BHEL.

4.7.7
After chemical cleaning / pickling of lubricating system (including oil piping, oil tank and other fittings) of rotating machines, oil flushing for lubricating systems as per instructions of BHEL engineer shall be carried out. Cleaning of oil tank of lubricating oil system of rotating machinery before and after oil flushing is in the scope of work.

4.7.8
Transportation of oil drums from customer's / BHEL's stores, filling of oil for flushing, first fill of lubricants and subsequent topping up during trials, tests and commissioning is included in the scope of this contract. The contractor shall have to return all the empty drums to the customer / BHEL stores. Similarly, for various pre-commissioning / commissioning activities / processes mentioned in various clauses, transport of chemicals from BHEL / customer's stores, charging of chemicals into the system and returning of remaining chemicals and the empty containers of the chemicals to customer / BHEL stores is the responsibility of the contractor.

4.7.9
During trial runs/ tests, pre-commissioning / commissioning, replacing / changing mechanical / other seals of equipments like pumps, removal and cleaning / replacing of filters etc is within the scope of work. Replacement spares for this purpose will be provided by BHEL.

4.7.10
In case any defect is noticed during tests, trial runs of all equipments and their auxiliaries, such as interferences, rubbing, loose components, abnormal noise or vibration, strain on connected equipment etc the contractor shall immediately attend to these defects and take necessary corrective measures. Readjustment and/or realignment, if necessary, shall be done as per BHEL engineer's instructions. Claim, if any, for these works shall be governed by Section-13, special conditions of contract provided the cause of such work is not attributable to the contractor.

4.7.11
i) Contractor shall cut / open / dismantle work, if needed, as per BHEL engineer's instructions during commissioning for inspection, checking and make good the works after inspection is over.

ii) Similarly, during the course of erection, if certain portion of equipments 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 contractors / 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 clauses in section-13 herein.

4.7.12
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 undergoes trial operations.

4.7.13
Commissioning activities will continue till the completion of trial operation. During this period contractor shall make available the services of separate dedicated workforce comprising of suitable skilled and semi-skilled / un-skilled workmen and supervisory staff along with necessary tools and plants, consumables etc.

4.7.14

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.

4.7.15
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.

4.7.16
At various stages of completion boiler has to be preserved against corrosion either by wet preservation or by dry preservation as per the requirement of BHEL engineer. Contractor shall carry out the entire incidental jobs like filling up of water, dozing of chemicals and pressurizing the system to the required pressure, change of gas refills etc. The boilers have a permanent n_2 blanketing arrangement.

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.

4.7.17
Commissioning activities will continue till the completion of trial run, trial operation. During this period contractor shall make available the services of separate dedicated labour force comprising of suitable skilled and semi/un-skilled hands along with necessary tools and plants, consumables etc.

4.7.18
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.

4.7.19
Assistance for conducting performance guarantee test is in the scope of contractor. Contractor shall install all necessary tapping points; instruments etc and provide necessary assistance in this regard**.**
In case PG test gets delayed beyond the contract period (normal plus grace plus extension if any) due to reasons not attributable to the contractor, PG test issue will be mutually discussed and commercially settled. However contractor shall install the tapping points, impulse pipes, approaches etc as per BHEL instruction and to the extent BHEL inputs are available prior to closure of contract.

4.7.20
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 GENERAL RESPONSIBILITY OF THE CONTRACTOR

4.8.1
The contractor shall have total responsibility for all equipment and materials in his custody at contractor's 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.

4.8.2 **Preservation & Protection of Components**

BHEL will issue majority of the plant equipment/components duly applied with primer and one coat of finish paint at shop. Componets/equipment that will finally remain exposed to atmosphere will be coated with Chlorinated Rubber painting system (except the steam system silencers and their exhaust pipes – provided with heat resistant aluminium paint); while the remaining componets will be coated with synthetic enamel paint. During the course of activities at site, the shop coat of paint may get peeled off/burnt. Contractor at all stages of work, shall ensure appropriate preservation of all such equipment/ component that are in his custody including those erected by him by way of applying touch up paint coating. Such preservation shall conform to preservation procedure of BHEL (if any), else according to the instructions of BHEL engineer. BHEL will provide the necessary primer and paint for Chlorinated Rubber paint system free of charges; while contractor shall arrange for the preservation materials for all other types of surfaces including machined surfaces in his cost.

4.8.3
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.

4.8.4
Contractor shall collect all scrap materials periodically from various area of work site, deposit the same at one 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.

4.8.5
The entire surplus, damaged, unused materials, packaging materials / containers, special transporting frames, gunny bags, etc shall be returned to BHEL stores by the contractor.

4.8.6
The contractor shall not waste any materials issued to him. In case it is observed at any stage that the wastage/excess utilisation of materials is not within the permissible limits, recovery for the excess quantity used or wasted will be effected with departmental charges from the contractor. Decision of BHEL on this will be final and binding on the contractor.

4.8.7
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.

4.9 Computer Based System

BHEL is operating web based computerized site operation management system (SOMS) that includes, inter-alia, issue of materials, daily progress reporting, contractor's running monthly billing and material reconciliation through a computerized data management system. Contractor shall install necessary hardware to hook-up with the BHEL's system and use the same for his scope of work. In the event the computerized SOMS is inoperative for any reasons, the contractor shall take delivery of materials from the storage area/sheds of BHEL/customer after getting the approval of the engineer/customer on standard indent forms to be specified by BHEL/customer. All these records however shall be updated in the SOMS as and when the SOMS is re-activated/normalized.

4.10 EXCLUSIONS

The following listed activities are specific exclusions from the scope of work under this tender specification-

1. LP By-pass valve with Hydraulic System
2. Downstream Steam Pipeline from LP by-pass valve to Condenser
3. Interceptor Valve to IP Turbine pipeline
4. Electrical components such as push-buttons, junction boxes etc.
5. E&C work of cable trays, cables and earthing etc
6. Control panels, EPMS, MCC etc.
7. Electrical & C&I items of equipment handling system
8. All electrical and control & instrumentation items except those specified elsewhere in these specifications.
9. Civil works except to the extent specifically indicated elsewhere in this tender.
10. Supply of primer and paints for final painting
11. Pneumatic copper tubing and fittings thereof.
12. Testing and commissioning of heating elements, thermostats, HV rectifier transformers.
13. Electrical and C&I items of variable frequency drives as provided elsewhere in these specifications.

SECTION-5

SPECIAL CONDITIONS OF CONTRACT

5.0 Obligations of the Contractor (Tools, Tackles, Consumables etc.)

5.1 ACCOMMODATION & LOCAL TRANSPORT FOR THE LABOURER & OTHER EMPLOYEES

BHEL/client is **not** providing any accommodation or space for labour colony. Contractor shall make his own arrangements for accommodation with necessary facilities etc for his workmen and the staff outside the project premises. 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 & Plants (T&P), Monitoring and Measuring devices (MMD) and handling & transportation equipments for the scope of work covered under these specifications. Please refer relevant Appendix for the list of T&P being provided by BHEL free of charges on sharing basis.

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 the 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 are further detailed in Section-7.

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.

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. The necessary test certificates for equipments to be submitted.

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. All MMD shall be calibrated at NABL accredited laboratory or any other laboratory approved by BHEL.

5.2.10
BHEL T&P will be issued in basic assembled or knocked down condition; contractor shall transport them 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 STRAND AND JACK ARRANGEMENT FOR BOILER DRUM ERECTION

Boiler drum will have provision of lifting lugs to enable erection by strand and jack method. Contractor shall arrange complete set up of strand and jack arrangement for erection of boiler drum to its designated elevation including the services of expert for execution and supervision. BHEL will not be providing the conventional electric winch and pulley set up for this purpose.

Some of the renowned agencies who can provide strand and jack lifting arrangement are –

1 M/s Fagioli PSC India Pvt Ltd (203, Krishna Bhavan, Govandi Station Road, Deonar, Mumbai 400 088, Telephone No 022 – 25564388, Fax No 022 – 25562565)

2 M/s Freight Wings (P) Ltd, (309, Rex Chambers, Walchand Hirachand Marg, Ballard Estate, Mumbai 400 001, Telephone No 022 – 22631714, 22632261, 22639988)

3 M/s Dorman Long Technology Ltd, (233 Bharat Industrial Estate, Lal Bahadur Shastri Marg, Bhandup (West), Mumbai 400 078, Telephone No 022 – 25961960, Mo 09820192807)

4 M/S Basu and Basu Engineers Pvt Limited, Kolkata, Telephone No 033 – 24642967, 24664069, Fax 033 – 24664621)

5 M/S Lift and Shift India Private Limited (96 Chembur, Mankhurd Link Road, Mumbai 400 043, Telephone 022 – 25484180, 25560101, Fax 022 – 25563573, E-Mail – projects@liftandshift.co.in)

Contractor may engage any of the above named agencies or any other competent agency known to contractor for this lifting activity. However contractor shall furnish credentials of the agency and obtain approval of BHEL before assigning the work to the agency.

5.2.12 CONSTRUCTION (PASSENGER CUM GOODS) ELEVATOR

Contractor shall deploy 1 MT capacity passenger-cum-goods elevator – one set in each boiler, to facilitate access to various platform elevations up to the boiler drum floor. Contractor, as part of his scope shall also install, operate and carry out preventive maintenance of this elevator. The elevator shall be deployed shortly after boiler drum erection of respective unit. Contractor shall dismantle and remove this elevator after completion of work or at appropriate stage as considered apt by BHEL.

5.2.13 HUCK INSTALLATION TOOLS & HOSE ASSEMBLY

BHEL will provide Huck Power Rig (hydraulic unit) for ESP Huck bolting activity. Contractor shall arrange installation tools (guns) and hose assemblies suitable for this set. The installations tools are supplied by the following listed agency.

IN U.K.
Alcoa Fastening Systems
Commercial Products
Stafford Park 7
Telford Shropshire TF3 3BQ
United Kingdom
Tel No. 0044 – 1952 – 290 011
Fax No. 0044 – 1952 – 290 459

IN INDIA
Alcoa Asia Limited
India Liaison Office
Meridien Commercial Tower
7TH Floor, Raisina Road
New Delhi-110 001
Tel No. 011 – 2371 7870 to 75
Fax No. 011 – 2371 7876

5.2.14 PENALTY FOR DELAYED DEPLOYMENT OF MAJOR T&P

BHEL shall levy non-refundable penalty in the following manner if the contractor delays deployment of major T&P such as cranes, construction elevator, Huck Installation Tools & Huck Hose Assy vis-a-vis the schedule as per the advice of BHEL based on project requirements. Tentative schedule given in relevant appendix is for guidance purpose.

a) In respect of 8 MT capacity pick and carry mobile crane: @ Rs. 1,000/- per day of delay, per crane.
b) In respect of 18 MT capacity crane: @ Rs. 5,000/- per day of delay, per crane.

c) In respect of 75 MT crawler crane : @ Rs 20,000/- per day of delay, per crane.
d) In respect of 1 MT capacity passenger cum goods elevator: @ Rs. 3,000/- per day of delay, per crane.

In case such delay is attributable to either BHEL or force majeure conditions, no such penalty shall be applicable.

Wherever tentattive schedules are not indicated, the decision of BHEL shall be final.

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

Contractor shall arrange ROZC (IS:2064) primers and synthetic enamel finish paint (IS:2932) for preservation of components issued to him, touch-up of heat affected areas resulting due to site work and painting damaged due to erection related activities. However, for chlorinated rubber and heat resistant aluminium painted components/ equipment, please refer Section-4 for method and scope of preservation.

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

Refer relevant clause of Section-4, Section-7 of Special Conditions of Contract and relevant Appendix in this regard.

5.3.5 Welding electrodes, filler wires for TIG welding and gases

5.3.5.1
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.

5.3.5.2
Filler wires, for TIG welding of pressure parts & 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. Similarly, BHEL will provide as free issue the welding electrode for welding of T-91/P-91 material tubes/pipes released as part of supply from manufacturing unit of BHEL.

5.3.5.3
Gases like argon, oxygen, acetylene etc that are required for erection related activities shall be arranged by the contractor at his cost. **For T-91 material site weld joints argon as per grade-3 of IS:5760 (1998) with oxygen and water vapour restricted to max 6 ppm each and with argon purity level of minimum 99.99% shall be arranged and used by the contractor.** The supply should accompany test certificate for the batch indicating individual element 'ppm' level and overall purity level.

5.3.5.4
Nitrogen gas, if required, for preservation of boiler and nitrogen capping during chemical cleaning process, will be provided by BHEL free of charge. Contractor shall arrange necessary connector, nipple, regulator, header and piping for usage of such gas from cylinders.

5.3.5.5
BHEL will provide free of charges the **induction heating equipment set** required for welding field joints of SA 335 P-91 material pipeline. The set will comprise of following:

(i) Main panel
(ii) Capacitor panel
(iii) Interconnection power & control cables between above panels
(iv) 185 sq mm special connecting cable from capacitor panel output – 5m length.

Contractor shall provide the input electrical power connection including arrangements such as db, cables etc, thermocouple pads, thermocouples and compensating cables, induction heating annealing cables (from the capacitor panel to joint and for wrapping around the weld joint) (spec: single core 240 sq. mm, 1200a, 3khz), ceramic wool and other consumables etc as may be required. Quantum of annealing cable requirement will depend on many parameters e.g. Weld joint size, heat input, type of connection i.e. Series or parallel etc.
Likely supplier: Mansfield cable co. Noida (U.P.).

5.4 FIELD OFFICE

5.4.1
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 within the project premises as per the availability of space.

5.4.2
On completion of work, all the temporary buildings, structures, pipelines, cables, etc shall be dismantled and levelled 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 levelling the area is limited only to the contractor's site office, yard and other spaces occupied by the contractor.

5.4.3.
BHEL is installing a computerized site management system at site to cover areas of material management, erection & commissioning, quality control, billing, MIR, etc. This system can be accessed through normal telephone lines and through LAN installed at site.

Contractor shall ensure that all operations in their scope that has interface with BHEL system is done only through this computerized system. Contractor shall make all arrangements for connectivity, computing equipment, personnel, software, etc to operate and interact with BHEL system. No manual system other then what is not covered by computerized system will be acceptable to BHEL.

5.5 AREA LIGHTING

5.5.1

Contractor shall arrange adequate floodlights, hand lamps and area lighting for material handling, unloading, verification, stacking, erection, pre-assembly activities etc. All temporary wiring must comply with regulations and will be subjected to engineer's inspection before connecting to supply point. Contractor shall use his own materials like cables, fuses, switch-boards etc. BHEL/client will not provide anything in this regard.

5.6 CONSTRUCTION POWER & WATER

5.6.1 CONSTRUCTION POWER

BHEL will provide construction power (three phase, 415v / 440v) free of charges normally at one point near the erection site. BHEL will provide Construction Power at additional points if found essential. Contractor shall deploy and install required energy meter, cables, fuses, distribution boards, switchboards, bus bars, earthing arrangements, protection devices and any other installation as specified by statutory authority/act. Contractor shall also obtain approvals of appropriate authority and pay necessary fees, levies etc towards the clearance of such installations, prior to use.

5.6.2
Contractor shall make necessary arrangements for onward distribution of construction power taking due care of surrounding construction activities like movement of cranes & vehicles, civil work, fabrication/construction/assembly/ erection etc and safety of personnel. It may become necessary to relocate some of the installations to facilitate work by other agencies or by him.

5.6.3
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. The installation and maintenance of this shall be done by licensed and experienced electrician.

5.6.4
While BHEL will make reasonable efforts to ensure continuous electric power supply, interruptions cannot be ruled out. 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.

5.6.5
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.

5.6.6 CONSTRUCTION WATER

BHEL/owner will provide water for construction purpose at a single point free of charges. Contractor shall make necessary arrangements for further distribution and carting beyond this point.

5.7 Responsibilities with regard to labour employment etc.

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

5.7.1
Contractor shall also comply with the requirements of local authorities/ project authorities calling for police verification of antecedents of the workmen, staff etc.

5.7.2
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.

5.7.3
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.

5.7.4.
Contractor shall provide at different elevation suitable arrangement for urinal and drinking water facility with necessary plumbing & disposal arrangement including construction of septic tank. These installations shall be maintained in hygienic condition at all times.

5.8
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 contractor.

5.9 Taxes, Duties, Levies

Refer to Clause 2.8.4 of General Conditions of Contract. Notwithstanding anything contained therein, the following provisions shall be applicable for this contract.

5.9.1

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 goods & 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.

However, provisions regarding Service Tax and Value Added Tax (VAT) on output services and goods shall be as per following clauses.

5.9.2 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 relevant 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.

5.9.3 VAT (Sales Tax /WCT)

As regards Value Added Tax (VAT) on transfer of property in goods involved in Works Contract (previously known as Works Contract Tax) 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.

5.9.4 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.

5.9.5 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.

5.10 Submission of periodical reports

Contractor shall submit periodical reports in respect of following aspects of operation:

1) Consumption of consumables like welding electrodes, gases and paints
2) Consumption of construction power
3) Availability and utilization of BHEL's tools & plants
4) Availability and utilization of contractor's tools & plants
5) Daily manpower reports
6) Daily progress reports of activities & incidents
7) Calibration reports
8) Records of wages payment
9) Any other report/record as may be specified by BHEL/client.

BHEL at site will suggest formats for these reports.

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 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. Contractor should furnish a tentative deployment plan of his manpower as required vide appendix-vi. 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 or BHEL's client.

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 ORGANISATION

The contractor shall provide adequate staffing in the following areas in addition to the staffing requirements of execution as instructed/informed by BHEL from time to time:

a) Material management
b) Overall planning, monitoring & control
c) Quality control and quality assurance
d) Safety, fire & security
e) Industrial relations and fulfilment of labour laws and other statutory obligations.

Section-7

Special Conditions of Contract

7.0 Obligations of BHEL

7.1 Facilities to be 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 as BHEL scope in these specifications.

7.1.4 MATERIALS FOR IBR WELDER QUALIFICATION TEST AT SITE

BHEL will provide the raw material free of charges for preparation of test pieces for conducting the site qualification test of **IBR welders**. Contractor shall prepare the required test pieces from such raw materials.

Contractor shall arrange all the materials and prepare test coupons for site qualification test of **all other welders**.

7.2 Filler wire for TIG welding and welding electrodes for welding of T-91/P-91 material tubes/pipes

Refer section-5 in this regard.

7.3 CONSTRUCTION EQUIPMENT, TOOLS & PLANTS

BHEL will make available T&P listed in the relevant appendix free of charge. Further details are as under:

7.3.1 CRANES TO BE PROVIDED BY BHEL

7.3.1.1

BHEL will make available the crane (as per relevant A**ppendix** free of charge to the contractor on sharing basis mainly for the purposes enumerated vide notes in the relevant Appendix**.** BHEL cranes have to be shared with other agencies / contractors of BHEL. The allocation of cranes shall be the discretion of BHEL engineer, which shall be binding on the contractor.

7.3.1.2

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.

7.3.1.3

Cranes, including the crane hired by BHEL, will be initially issued in basic assembled 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.

7.3.1.4
The day-to-day upkeep and running maintenance like filling / topping up of lubricants, changing filters etc, of BHEL owned 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 cranes.

7.3.1.5
Contractor shall provide the fuel for all the cranes. Operator for cranes hired by BHEL will be provided by the crane hiring agency of BHEL.

7.3.1.6
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
The responsibilities of contractor defined above for BHEL cranes shall also be applicable, mutatis – mutandis, in respect of other tool & plants provided by BHEL.

7.4.2
Chemical cleaning equipments that have to be used in temporary installations for the respective purpose have to be serviced by the contractor prior to use. BHEL will provide necessary spares, packing etc free of charge for the same. These have to be returned to BHEL after due servicing and preservation.

7.4.4
Special tools which are supplied by BHEL 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.

7.4.5
Lubricants like engine oil, cardium compound, hydraulic oil, gear oil, grease etc for BHEL's T&P including cranes will be provided by BHEL free of charge. Similarly filters for cranes will be provided free of charge by BHEL. All other consumables like cotton waste, cleaning agents etc shall be in the contractor's scope.

7.4.6
The contractor must not use these equipments for any purpose other than what they are intended for.

7.4.7
If the above items issued to contractor are found not utilised / not maintained to the satisfaction of BHEL engineer or misused, these will be withdrawn and no replacement will be done for such items.

7.4.8
Required temporary structural steel, pipes & fittings, valves as required for drum lifting, conduct of hydraulic test, chemical cleaning / steam blowing / oil flushing / acid cleaning etc shall be provided by BHEL.

7.5 CONSUMABLES FOR PRE-COMMISSIONING AND COMMISSIONING

7.5.1
All lubricants and chemicals required for testing, preservation, chemical cleaning, oil flushing and the lubricants for trial run of the plant equipment and trial operation of the units will be supplied by BHEL free of charges. BHEL will also provide raw materials for Target Plates required in steam blowing operation of pipeleins free of cost, successful bidder shall carry out fabrication and machining including polishing of the Target Plates as per requirement.
In case of any wastage or excess consumption attributable to the contractor in respect of the aforesaid consumables, the cost thereof including BHEL's overhead charges shall be recovered from the contractor.

7.6 PRIMER AND PAINTS FOR FINAL PAINTING

All primer, paints and thinner required for final painting shall be supplied by BHEL free of charges. BHEL will also provide chlorinated rubber primer, finish paint and heat resistant aluminium paint that are required for preservation of components/equipment (refer Section-4 for details).

The contractor, however, shall keep and furnish account of all the items issued to him and return the primer, paints etc remaining extra over the normal requirement with proper identification tags in a packed condition to BHEL stores. In case of any misuse or excess use over the normal requirement, BHEL reserves the right to recover the cost of such misuse/ excess use. Decision of BHEL engineer in this regard will be final and binding on the contractor.

Section-8
Special conditions of contract

8.0 Inspection/Quality Assurance/Quality Control/ Statutory Inspection

8.1 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.

8.2 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.

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

8.4 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.

8.5 All the welders shall carry identity cards as per the proforma prescribed by BHEL only welders duly authorized by BHEL/customer/consultant shall be engaged on the work.

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

8.7 The MMDs deployed by the contractor shall, at all stages of work, have valid and current calibration. BHEL shall be done the calibration of these MMDs from the agencies accredited/ approved. Copy of calibration certificates in respect of these MMDs 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 periodically as per BHEL specifications. Contractor shall conform to the specifications of BHEL regarding storage of the MMDs.

8.8 Re-work necessitated on account of use of invalid MMDs 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.

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

8.10 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.

8.11 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.

8.12 Statutory Inspection of Work

8.13.1

The work to be executed under these specifications has to be offered for inspection, at appropriate stages of work completion, to various statutory authorities for compliance with applicable regulations.

8.13.2

The work related statutory inspections, though not limited to, are as under:

1) Inspectorate of the Chief Electrical Inspector of Madhya Pradesh OR Central Electricity Authority as per statute.
2) Any other authority connected to this work.

The scope includes getting the approval of the installations from the statutory authorities, which includes arranging for inspection visits of statutory authority periodically as per BHEL engineer's instructions, submitting documents, radiographs etc. and following up the matter with them. Contractor shall also make all arrangements for offering the products/systems for inspection, as applicable, to the concerned authority.

8.13.3

It shall be contractor's responsibility to obtain approval of statutory authorities, whenever applicable, for conducting any work which comes under the purview of these authorities.

8.13.4

BHEL will pay fees for visits, inspection fees etc. of these statutory authorities. Please refer Section-5 for working arrangement for payment of fees in this regard. All other expenses shall be borne by the contractor. In case these inspections have to be repeated due to reasons attributable to the contractor and fees have to be paid again, the contractor has to pay such additional charges.

8.13.5

It shall be the responsibility of contractor to obtain license from chief electrical inspector, Maharashtra for carrying out high voltage work. Contractor shall also comply with the provisions of the latest Electricity Act, including the amendments thereof.

8.13.6

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

8.14.0

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.

8.15.0 Field Quality Assurance

Contractor shall carry out all activities conforming to the approved Field Quality Plan (FQP) as revised from time to time. Total quality shall be 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 the services of quality assurance engineer as per the relevant clauses.

SECTION-9

SPECIAL CONDITIONS OF CONTRACT

Safety, Occupational Health and Environmental Management

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 endeavour 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

Prepare a signboard giving the following information and display it near work site:

i) Name of Contractor
ii) Name of Contractor Site-in-charge & Telephone number
iii) Job Description in short

iv) Date of start of job
v) Date of expected completion
vi) Name of BHEL Site-in-charge.

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

9.1.6 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 authorised 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 it's authorised 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 PPEs 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 authorised 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 energised by electric power with supply voltage of more than 24 volts. For work in confined spaces, lighting shall be arranged with power source of not more than 24 volts.

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 authorised 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 authorised 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 authorised persons holding relevant license will drive and operate site plant and equipments eg cranes, dumpers, excavators, transport vehicles etc

9.2.1.15 Only authorised 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 authorised 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**

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 mobilisation 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 neighbouring
- 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.

9.2.1.27 At least 5% Contractors 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 organised 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 focussed

- Issue of approved Personnel Protective Equipment
- Verification that the PPEs 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

9.2.4ENVIRONMENT 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 minimisation. 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 neutralised 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

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

9.3.3

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.

9.3.4 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 authorised 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 Employees 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 authorised 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 PPEs
- 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.

S	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 Coordinator	Daily 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	Violation of Safety Norms	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/-

SN	Violation of Safety Norms	Fine (Rs)
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 utilised 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 recognise 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:

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 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 No.	YEAR	Amd upto	DESCRIPTION
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 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 No.	YEAR	Amd upto	DESCRIPTION
IS 5184	1969		CODE OF SAFETY FOR HYDROFLUORIC ACID
IS 5216	1982	2000	RECOMMENDATIONS ON SAFETY 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 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 No.	YEAR	Amd upto	DESCRIPTION
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 tenderness, 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. Offers will evaluated on the total amount for the entire Rate Schedule and the work will be awarded without splitting the scope.

10.8
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. BG for advance payment shall be kept valid for a period of two more months beyond the recovery period of the advance with interest thereof.

Section-11

Special conditions of contract

Time Schedule, Mobilization, Progress Monitoring, Overrun, Variation etc.

11.1 MOBILIZATION, TIME SCHEDULE, CONTRACT PERIOD AND GRACE PERIOD

11.1.1 MOBILIZATION AND COMPLETION SCHEDULE

Contractor shall mobilize necessary resources within **four weeks** of issue of fax letter of intent to commence the erection work.

The contractor has to subsequently augment his resources in such a manner that following major milestones of erection & commission are achieved on specified schedules:

SN	Major milestone	Tentative completion Schedule for Unit # 3
1	Boiler Erection Start	15-Nov-2008
2	Boiler drum erection	28-Feb-2009
3	Boiler hydraulic test (drainable)	30-Sept-2009
4	Boiler light up	20-Dec-2009
5	Chemical cleaning	10-Jan-2010
6	Steam blowing	20-Feb-2010
7	Synchronization	20-Mar-2010
8	Coal firing	10-Apr-2010
9	Trial Operation	25-May-2010
10	Stabilization of the plant operation, Completion of all Facilities & Performance Guarantee Test	20-July-2010

Tentative schedule for Unit # 4 will be with a time gap of four months after that of unit # 3.

In order to meet above schedule in general, and any other intermediate targets set, to meet customer/ project schedule requirements, contractor shall arrange & augment all necessary resources from time to time on the instructions of BHEL.

11.1.2 COMMENCEMENT OF CONTRACT PERIOD

Erection/placement on it's designated foundation/location, of the first major permanent equipment/component/column covered in the scope of these specifications shall be recognized as "start of contract period". Smaller items

like packer plates, shims, anchors, inserts etc will not be considered as start of contract period.

11.1.3 **CONTRACT PERIOD**

The contract period for completion of entire work under scope shall be **20 (twenty) months** from the "start of contract period" as specified earlier.

11.1.3 **GRACE PERIOD**

Grace period of **4 (four) months** beyond the Contract Period may be provided for this contract at the discretion of BHEL.

11.1.4 **CONSEQUENCE OF DELAY**

It may be noted that in the event delay in completion is attributable to the contractor and leads to imposition of liquidated damages by BHEL's client, BHEL will impose ld on the contractor as per GCC.

11.**2 PROGRESS MONITORING, CONTRACT EXTENSION AND OVERRUN**

11.2.1 PROGRESS MONITORING

Progress will be reviewed periodically (daily/weekly/monthly) including month end review vis-a-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.

11.2.2 **ASCERTAINING AND ESTABLISHING THE REASONS FOR SHORTFALL**

The onus probandi that the causes leading to extension of 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. 11.2.1 above will be made considering the availability of components to be erected and other inputs / constraints 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:

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

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

C) 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.

D) Erection / commissioning programme not achieved due to any other reasons not attributable to the contractor.

11.2.3 **CONTRACT EXTENSION**

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

11.2.4
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 described in clause no. 11.2.2 shall be done during the extended period. The overrun 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 in these specifications are not made by him.

11.2.5
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 lastly on account of BHEL.

11.2.6 OVERRUN COMPENSATION

If the contract is extended beyond the contract and grace period 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.1,00,000/- (Rupees one lakh only) per month. Overrun compensation will be paid for the extension attributable to BHEL only. **No overrun compensation shall be payable for the extension of contract on account of reasons of delay of erection & commissioning work attributable to contractor and/or force majeure conditions**. Overrun compensation for eligible period shall be in proportion to the progress achieved against the plan for respective period.

I

11.3 PRICE VARIATION

In order to take care of variation in cost of execution of work on either side, due to variation in the index of LABOUR, DIESEL and ELECTRODE, Price Variation Formula as described herein shall be applicable

11.3.1
85% component of Contract Value shall be permitted to be adjusted for variation in various relevant indices during execution of work. The remaining 15% shall be treated as fixed component.
11.3.2
The basis for calculation of price variation in each category, their component, Base Index, Base Date of accounting shall be as under:

.SL NO.	CATEGORY	COMPONENT ('K')	BASE INDEX	BASE DATE
A)	LABOUR (ALL CATEGORIES)	40%	CONSUMER PRICE INDEX FOR INDUSTRIAL WORKERS (GENERAL), APPLICABLE TO 'ALL INDIA' AS PUBLISHED BY LABOUR BUREAU, SHIMLA	Base date shall be calendar month of last date of submission of Tender (including extended date of submission if any)

B)	H.S. DIESEL OIL	5%	WHOLE SALE PRICE INDEX (FOR COMMODITY :HIGH SPEED DIESEL) PUBLISHED BY MINISTRY OF COMMERCE AND INDUSTRY (www.eaindustry.nic.in)	...DO...
C)	WELDING ELECTRODE	40%	WHOLE SALE PRICE INDEX (FOR COMMODITY:ELECTRODES) PUBLISHED BY MINISTRY OF COMMERCE AND INDUSTRY (www.eaindustry.nic.in)	...DO...

11.3.3

Payment/recovery due to variation in index shall be determined on the basis of the following notional formula without any initial absorption, in respect of the identified components viz LABOUR, HS DIESEL and ELECTRODE

$$A = K \times R \times \frac{(X_N - Xo)}{Xo}$$

Where

A = Amount to be paid/recovered due to variation in the Index for Labour, Electrode and HS Diesel

K = Percentage component applicable for Labour, Electrode and HS Diesel

R = Value of work done for the billing month

XN = Revised Index No for Labour, Electrode and HS Diesel for the billing month under consideration

Xo = Index no for Labour, Electrode and HS Diesel as on the Base date. Base date for each of the category is defined in the table above

11.3.4

The above Price Variation formula is applicable for the entire Contract period, Grace period, and the extended contract period if any. However for the period extended on account of reasons attributable to the contractor and/or Force Majeure conditions, the price variation will be applied based on the respective indices/prices frozen at the calendar month preceding the start of such extended period.

11.3.5

The price Variation is not applicable to Over Run Charges, Manday rates for extra works etc.
Similarly Price Variation shall not be applicable for the respective % assigned to milestone activities viz Oil Flushing, Barring Gear, Commissioning of Condensate System, Commissioning of Feed Water System and Synchronization

11.3.6

The contractor shall furnish necessary monthly bulletins for WHOLE SALE PRICE INDEX (for Commodity :ELECTRODES and HS DIESEL) Published by Ministry of Commerce and Industry (www.eaindustry.nic.in) and CONSUMER PRICE INDEX for INDUSTRIAL WORKERS (GENERAL), applicable to 'All India' as published by Labour Bureau, Shimla.

11.3.7

The contractor will be required to raise the bills for price variation payments on a monthly basis along with the running bills irrespective of the fact whether any increase/decrease in the consumer price index for Labour, HS Diesel and Electrode has taken place or not. In case there is delay in publication of bulletins (final figure), the provisional values as published can be considered for payments and arrears shall be paid/recovered on getting the final values.

11.3.8

The Total Quantum of Price Variation shall not exceed fifteen percentage (15%) of executed Contract Value. Executed Contract value for this 15% cap shall not include Overrun charges, Extra works.

11.3.9

With the above provision, the clause no. 2.15 of General Conditions of Contract section-2 is not applicable.

11.4 CONTRACT VARIATIONS

11.4.1 VARIATION IN WEIGHT/QUANTITIES

Weight of various equipments, quantities of various items of work covered under these specifications and indicated in relevant appendices are likely to vary. For any upward or downward variation in the quantities, the rates accepted shall be applicable without any variation. Payment will be made by BHEL for the actual executed quantity of respective item as certified by BHEL engineers.

11.6 INTEREST BEARING ADVANCE

Interest bearing (rate of interest shall be prime leading rate of SBI plus 2% per annum, 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 by the time contractor reaches 90% billing of total value of work executed & within the contract period (including extensions granted or foreclosure if any).

11.7 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

12.0 TERMS OF PAYMENT

12.0.1
The contractor shall submit his monthly RA account bills with all the details required by BHEL on specified date every month covering progress of work in all respects and areas for the previous calendar 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 **12 months** from the date of completion of entire work as certified by BHEL.

However, on specific request of vendor, this amount may be released on pro rata basis for the value of work executed and accepted by BHEL, along with any RA Bill and onwards, subject to receipt and acceptance of bank guarantee of equal amount in BHEL's prescribed format. The BG shall be kept valid till completion of such guarantee period and an additional six months claim period. This is also subject to the condition that the contractor has started the work and also furnished/remitted the initial Security Deposit as per contract.

12.0.4
The payment for running bills will normally be released within 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.

12.0.5
BHEL will release payment through Electronic Fund Transfer (EFT)/RTGS. In order to implement this system, the following details are to be furnished by the Contractor pertaining to his Bank Accounts where proceeds will be transferred through BHEL's banker:

1. Name of the Company
2. Name of Bank
3. Name of Bank Branch
4. City/Place
5. Account Number
6. Account type
7. IFSC code of the Bank Branch
8. MICR Code of the Bank Branch

BHEL may also choose to release payment by other alternative modes as suitable.

12.1 STAGES OF PROGRESSIVE PRO-RATA PAYMENTS

100% OF ITEM RATE FOR VARIOUS ITEMS OF WORK UNDER THESE SPECIFICATIONS WILL BE RELEASED, BASED ON CERTIFIED COMPLETION BY BHEL ENGINEER, AS PRO-RATA PROGRESSIVE PAYMENT AS PER THE STAGE BREAK UP GIVEN HEREAFTER:

12.1.1 E & C OF BOILER AND AUXILIARIES, PIPING, FABRICATED STRUCTURES ETC (REFER SECTION-"C" OF RATE SCHEDULE.

SN	PART OF THE ACTIVITY COMPLETED	PERCENTAGE BREAK UP OF ACCEPTED ITEM RATES					
		NON-PR PARTS	STRUC-TURES	PR. PARTS	ROTATING M/c	E S P	INSULA-TION
A	TRANSPORT, & ERECTION / PLACEMENT	40	40	40	40	40	40
B	ALIGNMENT, BOLTING, GROUTING & WELDING	45	45	40	45	45	45
C	GAS TIGHTNESS TEST / KEROSENE LEAK TEST / LPI TEST ETC	5	---	---	---	5	5
D	NDE AND HEAT TREATMENT	---	3	10	---	--	--
E	TRIAL RUN OF ROT. M/C	---	---	---	5	--	--
F	ON COMPLETION OF DRUM LIFTING	---	3	---	---	--	--
G	ON COMPLETION OF HYDRAULIC TEST OF BOILER (DRAINABLE)	---	2	3	---	--	--
H	ON COMPLETION OF HYDRAULIC TEST OF BOILER (NON-DRAINABLE)	---	---	2	---	--	--
I	ON COMPLETION OF BOILER LIGHT UP AND ABO	2	2	2	2	2	2
J	ON COMPLETION OF FINAL PAINTING	2	3	---	1	1	1
K	ON COMPLETION OF SVF & STEAM BLOWING	1	1	1	2	1	1
L	COAL FIRING	4	---	1	4	5	5
M	TRIAL OPERATION	1	1	1	1	1	1
	TOTAL	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

12.1.2 PIPING (ITEM No. 7 OF RATE SCHEDULE)

(A) 25% OF THE CONTRACT RATE ON PRORATA BASIS AFTER PLACEMENT IS COMPLETED.

(B) 30% OF THE CONTRACT RATE ON PRORATA BASIS AFTER ALIGNMENT & JOINT FIT-UP IS COMPLETED.

(C) 25% OF THE CONTRACT RATE ON PRORATA BASIS AFTER COMPLETION OF WELDING

(D) 10% OF THE CONTRACT RATE ON PRORATA BASIS AFTER COMPLETION OF NDE & POST WELD HEAT TREATMENT, IF ANY.

(E) 4% OF THE CONTRACT RATE ON PRORATA BASIS AFTER COMPLETION OF HYDRAULIC TEST

(F) 3% OF THE CONTRACT RATE ON PRORATA BASIS AFTER FLOATING OF LINE ON PERMANENT SUPPORTS AND REMOVAL OF TEMPORARY SUPPORT

(G) 2% OF THE CONTRACT RATE ON PRORATA BASIS AFTER FINAL ADJUSTMENT OF SUPPORTS FOR COLD AND HOT VALUES FOR BOILER TRIM, INTEGRAL PIPING AND CRITICAL PIPING.

(H) 1% OF CONTRACT RATE AFTER COMPLETION OF FINAL PAINTING & COLOUR BANDING.

12.1.3 RADIOGRAPHY TEST (Item No. 8 of Rate Schedule)

100% OF THE CONTRACT RATE ON PRORATA BASIS ON ACCEPTANCE OF THE SAME. IN THE CASE OF SUBSTUTION OF 'RT' WITH ULTRASONIC TEST, THE RATES WILL BE LIMITED TO THAT OF RADIGRAPHY.

12.2 MODE OF PAYMENT AND MEASUREMENT OF WORK COMPLETED

CLAUSE 2.6 OF THE GENERAL CONDITIONS OF CONTRACT SHALL BE APPLICABLE. THE SCOPE OF WORK UNDER THIS CONTRACT SHALL BE TREATED AS COMPLETED ONLY WHEN SO CERTIFIED BY SITE ENGINEER OF BHEL.

12.3 GENERAL

12.3.1
WEIGHT OF PACKERS AND SHIMS WHICH BECOME PERMANENT PART OF EQUIPMENT, BOTH FIGURING IN SHIPPING LIST AND THOSE FABRICATED AT SITE WILL BE PAID FOR ON SHIPPING LIST BASED ACTUAL WEIGHT.

12.3.2
CERTAIN OPTIMIZED ASSEMBLIES / OR MODULES MAY BE MADE, ASSEMBLING PRODUCTS FROM TWO OR MORE DIFFERENT PRODUCT GROUP MAIN ASSEMBLY AND DISPATCHED. PAYMENT FOR ERECTION OF THESE OPTIMIZED ASSEMBLIES / OR MODULES WILL BE REGULATED AS PER THE WEIGHT OF INDIVIDUAL PRODUCT GROUP MAIN ASSEMBLIES CONTRIBUTING TO THE TOTAL WEIGHT OF THE MODULE OR OPTIMIZED ASSEMBLY AT THE QUOTED RATE FOR THE RESPECTIVE PRODUCT GROUP MAIN ASSEMBLIES, IN THE RATE SCHEDULE.

12.3.3
FOR PAYMENT OF TEMPORARY SYSTEM FOR CHEMICAL CLEANING AND STEAM BLOWING OF BOILER AND PIPING THE MEASUREMENT FOR THE PIPING, FITTING, VALVES ETC AND EQUIPMENTS LIKE TANKS, STRUCTURES PROVIDED BY BHEL & NOT FIGURING IN SHIPPING LIST WILL BE BASED ON JOINTLY MEASURED QUANTITY AND CORRESPONDING STANDARD WEIGHTS. PAYMENT WILL BE MADE AT THE RATE APPLICABLE FOR **NON-PRESSURE PARTS** FOR ITEMS. NO PAYMENT WILL BE MADE

FOR THE EQUIPMENTS BROUGHT BY THE CONTRACTOR SUCH AS PUMPS ETC AND FOUNDATIONS MADE BY THE CONTRACTOR FOR TEMPORARY SYSTEMS.

12.4 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 LATEST RELEVANT INDIAN STANDARDS IN THIS REGARD MAY 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 NOT BE CONSIDERED FOR 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 (e.g. FURNACE PLATFOMS – SKY CLIMBERS, PASSENGER ELEVATOR) ETC USED IN VARIOUS ACTIVITIES OF THIS WORK.

I) NO PAYMENT WILL BE MADE FOR WEIGHT OF RUBBER LINING.

SECTION-13
SPECIAL CONDITIONS OF CONTRACT

13.0 EXTRA CHARGES FOR RECTIFICATION AND MODIFICATION

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, ARE 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.

13.2 IT MAY ALSO BE NOTED THAT IF ANY SUCH SAID EXTRA WORKS ARISE ON ACCOUNT OF THE CONTRACTOR'S FAULT, IRRESPECTIVE OF TIME CONSUMED IN RECTIFICATION OF THE DAMAGE/LOSS, IT 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.

13.3 HOWEVER, BHEL MAY CONSIDER FOR PAYMENT AS EXTRA, 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 13.4 TO13.8 AND/OR 14.2.1 TO 14.2.10 AS THE CASE MAY BE. 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. IT MAY ALSO BE NOTED THAT ONLY THOSE WORKS THAT ARE IDENTIFIED AS MAJOR AND WARRANT EXTRA PAYMENT AND CERTIFIED AS SUCH BY THE SITE ENGINEER AND ACCEPTED BY THE DESIGNERS AND/OR COMPETENT AUTHORITY OF BHEL, WILL BE CONSIDERED FOR EXTRA PAYMENT.

13.4 FOR EXTRA WORKS ARISING OUT OF TRANSIT, STORAGE AND ERECTION DAMAGES, PAYMENT, IF FOUND DUE, WILL BE REGULATED BY CLAUSES 14.2.1 TO 14.2.10.

13.5 ALL THE EXTRA WORK SHOULD BE CARRIED OUT BY A SEPARATELY IDENTIFIABLE GANG, WITHOUT AFFECTING ROUTINE ACTIVITIES. DAILY LOG SHEETS IN THE PRO-FORMA 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 EXTRA WORKS. ALL ADMISSIBLE CLAIMS SHALL BE SUBMITTED TO BHEL

13.6 BHEL RETAINS THE RIGHT TO AWARD OR NOT TO AWARD ANY OF THE MAJOR REPAIR/ REWORK/MODIFICATION/RECTIFICATION/FABRICATION WORKS UNDER CLAUSES 13.1 TO 13.6 TO THE CONTRACTOR, AT THEIR DISCRETION WITHOUT ASSIGNING ANY REASON FOR THE SAME.

13.7 EXTRA WORKS THAT ARISE ON ACCOUNT OF CONTRACTOR’S FAULT WILL HAVE TO BE CARRIED OUT BY THE CONTRACTOR FREE OF COST INCLUDING THE SUPPLY OF MATERIAL AND CONSUMABLES

13.8 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.

MAN-DAY RATE FOR ELIGIBLE EXTRA WORKS :

SINGLE AVERAGE MAN-DAY RATE, INCLUDING OVERTIME IF ANY, AND OTHER SITE EXPENSES AND INCIDENTALS, INCLUDING CONSUMABLES, TOOLS AND TACKLES, FOR CARRYING OUT ANY MAJOR REWORK/ REPAIRS/ RECTIFICATION/ MODIFICATION/ FABRICATION OF 8 HOURS AS MAY ARISE DURING THE COURSE OF ERECTION. (REFER CLAUSES 13.1 TO 13.8 AND 14.2.1 TO 14.2.10) UNDER BOILER & AUX. ERECTION & COMMISSIONING WORKS WILL BE **RS. 320/- (RUPEES THREE HUNDRED AND TWENTY ONLY).**

NO PAYMENT WILL BE MADE IF AN ITEM OF WORK LASTS LESS THAN 100 MANHOURS.

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/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 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 specification. 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 bidders' 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 & BANK GUARANTEE

15.1 Earnest Money Deposit:

i) EMD for this tender is Rs. 2,00,000/- (Rupes Two lakhs only).
ii) Bidders who have already deposited One Time EMD of Rs. 2.00 lakh are exempted from submission of EMD for this tender. However a copy of 'One Time EMD' certificate issued by BHEL/PSWR, Nagpur shall be enclosed along with the Offer.
iii) EMD is to be paid in cash (as permissible under Income Tax Act), Pay order or Demand Draft in favour of Bharat Heavy Electricals Limited and payable at Nagpur.
iv) No other form of EMD remittance shall be acceptable to BHEL.

15.1.1 EMD by the bidder will be forfeited as per Tender Documents if

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

ii) The bidder 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.

15.1.2 EMD shall not carry any interest.

15.1.3 In the case of unsuccessful bidders, the Earnest Money will be refunded to them after acceptance of tender by successful bidder

15.2 Security Deposit

15.2.1 Security Deposit shall be furnished by the successful bidder. 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 should be furnished before start of the work by the contractor.

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 SD has to be remitted either by cash or in the other forms 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.

viii. EMD of the successful bidder shall be converted and adjusted against the cash Security Deposit excepting for such bidder who has remitted One Time EMD.

ix. 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

15.3 BANK GUARANTEE

i. It is the responsibility of the bidder to get the Bank Guarantees revalidated/extended for the required period as per the advice of BHEL Site Engineer / Construction Manager. BHEL shall not be held liable for issue of any reminders regarding expiry of the Bank Guarantees.

ii. In case extension/further extensions of any Bank Guarantees are not required, the bidders shall ensure that the same is explicitly conveyed through the Construction Manager to BHEL PSWR/HQ, Nagpur

iii. In case the Bank Guarantees are not extended before the expiry date, BHEL reserves the right to invoke the same by informing the concerned Bank in writing, without any advance notice/communication to the concerned bidder.

iv. **Bidders to note that any corrections to Bank Guarantees shall be done by the issuing Bank, only through an amendment in an appropriate non judicial stamp paper.**

v. Bidders to ensure that the Bank Guarantees submitted are exactly as per format given in the Tender documents.

vi. The Original Bank Guarantee shall be sent directly by the Bank to BHEL under Registered Post (Acknowledgement Due). However, in exceptional cases, where guarantee is directly received by Vendor, the Vendor shall instruct the Bank to send an unstamped duplicate copy of the guarantee directly to BHEL under Registered Post (Acknowledgement Due).

APPENDIX - I
ESTIMATED WEIGHT DETAILS OF VARIOUS SYSTEMS IN SCOPE OF WORK

PG	MA	Stage	Brief Decsription	Design Wt (MT)	
				Unit-3	Unit-4
A. Pressure Parts					
			Boiler Drum & Suspension		
04	126	DL	Upper Drum without internals	138.50	138.50
04	136	DL	Upper Drum Internals	4.10	4.10
04	146	DL	Upper Drum Suspension	12.80	12.80
			Sub-Total	**155.40**	**155.40**
			Total for two units	**310.80**	
			Water Wall Headers		
05	137	HT	Header - Inlet Front Lower WW	13.70	13.70
05	147	HT	Header - Inlet Rear Lower WW	13.70	13.70
05	155	HT	Header - Inlet Side Lower WW	16.70	16.70
05	175	HT	Header - Inlet Extended Side WW	1.30	1.30
05	227	HT	Header - Waterwall Rear Hanger Tubes	2.70	2.70
05	229	HT	Header - Outlet Rear WW	6.00	6.00
05	231	HT	Header - Outlet Front WW	3.70	3.70
05	251	HT	Header - Outlet Side WW	6.80	6.80
			Sub-Total	**64.60**	**64.60**
			Total for two units	**129.20**	
			Water Wall Panels		
06	400	HT	Unclassified Burner Panel	15.70	15.70
06	631	HT	Front Upper WW Panel	41.90	41.90
06	634	HT	Front Intermediate WW Panel	17.40	17.40
06	637	HT	Waterwall Lower Front Panel	20.00	20.00
06	644	HT	Rear Intermediate WW Panel	33.20	33.20
06	647	HT	Rear Lower WW Panel	20.00	20.00
06	651	HT	Side Upper WW Panel	60.70	60.70
06	655	HT	Side Lower WW Panel	47.80	47.80
06	670	HT	Extended Side WW Panel	8.40	8.40
			Sub-Total	**265.10**	**265.10**
			Total for two units	**530.20**	
			Downcomer & Other Pipies		

PG	MA	Stage	Brief Decsription	Design Wt (MT)	
				Unit-3	Unit-4
07	108	HT	Down Comer Piping Upper	67.80	67.80
07	109	HT	Down Comer Piping Lower	74.90	74.90
07	215	HT	Relief Tubes from Sides	19.50	19.50
07	216	HT	Relief Tubes from Rear	20.30	20.30
07	218	HT	Relief Tubes from Front	5.90	5.90
07	223	HT	Furnace Screen Tubes	21.20	21.20
07	225	HT	Furnace Rear Hanger Tubes	8.80	8.80
07	226	HT	Furnace Rear Arch Tubes	15.60	15.60
07	231	HT	Lower Corner Transition Tubes	1.80	1.80
07	232	HT	Upper Corner Transition Tubes	0.50	0.50
07	401	HT	Waterwall Suspension	15.10	15.10
07	500	HT	Misc Components	0.30	0.30
07	501	HT	Furnace Insert Tubes	2.00	2.00
07	601	HT	Pressure Seals	0.80	0.80
07	700	HT	Bulked BPS Items	0.90	0.90
07	992	HT	Imported Electrodes	0.10	0.10
07	993	HT	Consumables & Erection Materials	0.40	0.40
			Sub-Total	**255.90**	**255.90**
			Total for two units	**511.80**	
			Superheater System (PG 10, 11, 12)		
10	135	HT	Header - Horizontal Spaced SH Inlet	6.80	6.80
10	174	HT	Header - Vertical Spaced SH Inlet	10.40	10.40
10	178	HT	Header - Vertical Platen SH Inlet	6.50	6.50
10	182	HT	Header - SH Rear Wall Inlet	3.50	3.50
10	183	HT	Header - SH Front Wall Inlet	5.40	5.40
10	184	HT	Header - SH Extended Side Wall Inlet	0.60	0.60
10	185	HT	Header - SH Rear Roof Inlet	3.40	3.40
10	191	HT	Header - SH Radiant Wall Inlet	2.70	2.70
10	235	HT	Heasder - SH Horizontal Spaced Outlet	8.10	8.10
10	274	HT	Header - SH Vertical Spaced Outlet	15.00	15.00
10	278	HT	Header - SH Vertical Platen Outlet	7.30	7.30
10	283	HT	Header - SH Front wall Outlet	5.00	5.00
10	284	HT	Header - SH Extended Side Outlet	1.00	1.00

PG	MA	Stage	Brief Decsription	Design Wt (MT)	
				Unit-3	Unit-4
10	291	HT	Header - SH Radiant Wall Outlet	5.20	5.20
10	687	HT	Header - SH Radiant Wall Outlet	3.00	3.00
			Sub-Total	**83.90**	**83.90**
			Total for two units	**167.80**	
11	236	HT	SH Horizontal Spaced Upper	210.00	210.00
11	237	HT	SH Horizontal Spaced Lower	200.00	200.00
11	274	HT	SH Vertical Spaced Coil	163.00	163.00
11	278	HT	SH Vert Platen Centre	98.00	98.00
11	616	HT	SH Rear Upper Panel	14.30	14.30
11	618	HT	SH Rear Lower Panel	6.90	6.90
11	684	HT	SH Extended Side Wall	3.60	3.60
11	685	HT	SH Front Wall Panel	12.10	12.10
11	686	HT	SH Roof Panel	13.40	13.40
11	687	HT	SH Rear Roof Panel	10.40	10.40
11	688	HT	SH Center Roof Panel	15.10	15.10
11	691	HT	SH Radiant Wall Panel	20.60	20.60
11	694	HT	SH Extended Bottom Panel	2.70	2.70
			Sub-Total	**770.10**	**770.10**
			Total for two units	**1540.20**	
12	174	HT	SH Vertical Spaced	4.80	4.80
12	184	HT	Roof Inlet SH Pipes	2.30	2.30
12	187	HT	SH Inlet Rear Roof Pipes	1.40	1.40
12	535	HT	SH Hor Spaced Hanger Tubes	36.00	36.00
12	803	HT	SH Steam Cooled Spacer	1.50	1.50
12	805	HT	Super Heater Hanger Tubes	5.10	5.10
12	850	HT	SH Conn Pipes-Saturation Links	7.00	7.00
12	852	HT	SH DeSH Links	10.90	10.90
12	900	HT	SH DeSH	3.00	3.00
12	903	HT	SH Misc Components	24.80	24.80
12	906	HT	SH Supp for Lines	6.00	6.00
12	914	HT	Suspension of SH Radinat Roof	0.60	0.60
12	917	HT	Suspension of Radiant SH	3.50	3.50
12	924	HT	Suspension of SH Back Pass	15.00	15.00

PG	MA	Stage	Brief Decsription	Design Wt (MT)	
				Unit-3	Unit-4
12	927	HT	Suspension of SH Rear	2.50	2.50
12	928	HT	Suspension of SH Rear	5.50	5.50
12	944	HT	Suspension of SH Platen	1.60	1.60
12	948	HT	Suspension of Vert SH	19.00	19.00
12	954	HT	Suspension of Vert SH	4.30	4.30
12	968	HT	Suspension of Platen SH	13.00	13.00
12	992	HT	Imported Electrodes	0.10	0.10
12	993	HT	Consumables & Ern Matls	0.30	0.30
			Sub-Total	**168.20**	**168.20**
			Total for two units	**336.40**	
			Reheater System (PG 15, 16, 17)		
15	174	HT	Reheater Vert Spaced	6.50	6.50
15	274	HT	Reheater Vert Spaced	17.50	17.50
			Sub-Total	**24.00**	**24.00**
			Total for two units	**48.00**	
16	275	HT	RH Vertical Spaced	61.10	61.10
16	277	HT	Vert Rear Platen	96.00	96.00
			Sub-Total	**157.10**	**157.10**
			Total for two units	**314.20**	
17	904	HT	RH Hdr Suprts & Suspension	7.00	7.00
17	919	HT	RH Front Suspension	7.50	7.50
17	929	HT	RH Rear Suspension	14.00	14.00
17	992	HT	RH Imported Electrodes	0.10	0.10
			Sub-Total	**28.60**	**28.60**
			Total for two units	**57.20**	
			Economiser System (PG 19)		
19	114	HT	Coils & Supports	91.00	91.00
19	124	HT	Coils & Supports	141.40	141.40
19	701	HT	Inlet Eco Headers	5.60	5.60
19	702	HT	Outlet Eco Headers	4.60	4.60
19	753	HT	Headers of Rear Inlet	2.70	2.70
19	763	HT	Headers of Front Inlet	2.70	2.70
19	783	HT	Headers of Centre Inlet	2.70	2.70

PG	MA	Stage	Brief Decsription	Design Wt (MT)	
				Unit-3	Unit-4
19	802	HT	Eco Hanger Tubes	12.00	12.00
19	850	HT	Eco Feed Pipe	3.30	3.30
19	851	HT	Eco Links to Drum	10.30	10.30
19	904	HT	Eco Supports & Suspension	12.60	12.60
19	905	HT	Eco Supports & Suspension	10.70	10.70
19	906	HT	Eco Supports for Lines	0.80	0.80
19	992	HT	Imported Electrodes	0.00	0.00
			Sub-Total	**300.40**	**300.40**
			Total for two units	**600.80**	
			Soot Blower Piping		
21	600	SY	Soot Blower Piping	6.50	6.50
21	601	SY	Sootblower Piping supports	4.50	4.50
21	700	SY	Bulked BPS Components	0.70	0.70
21	800	SY	SB Valves (BHEL)	0.60	0.60
21	825	SY	SB Valves (Sub Delivery)	0.30	0.30
21	850	SY	Soot Blower Safety Valve	0.20	0.20
21	987	SY	Commg Spares	0.01	0.01
21	988	SY	Commg Spares	0.01	0.01
21	992	SY	Imported Electrodes	0.10	0.10
			Sub-Total	**12.92**	**12.92**
			Total for two units	**25.84**	
			Fine Fittings & Boiler Trim Piping		
24	200	HT	Boiler Trim Piping	35.00	35.00
24	215	LU	Spray Water System	3.00	3.00
24	240	LU	Sample Cooler	0.60	0.60
24	260	HT	Valves (BHEL)	21.00	21.00
24	265	LU	Valves & Fitting	7.50	7.50
24	273	LU	Direct Water Level Gauge	0.30	0.30
24	275	HT	Headers for Trim Piping	0.90	0.90
24	280	HT	ERV and Safety Valve	4.00	4.00
24	350	HT	Boiler Filling Piping	0.70	0.70
24	991	HT	Imported Electrodes	0.20	0.20
			Sub-Total	**73.20**	**73.20**

PG	MA	Stage	Brief Decsription	Design Wt (MT)	
				Unit-3	Unit-4
			Total for two units	**146.40**	
			Fuel Oil Pipeline		
42	002	LU	Steam Blowing Matls	0.50	0.50
42	120	LU	Piping, Pump House-Fuel Oil	2.50	2.50
42	128	LU	Piping, Pump House-Steam (IBR)	0.20	0.20
42	150	LU	Piping, Operating Floor (HFO)	3.00	3.00
42	152	LU	Piping, Operating Floor (LFO, Air)	1.00	1.00
42	154	LU	Piping,Opr'G Floor	1.50	1.50
42	157	LU	Piping,Opr'G Flooor - Air	0.90	0.90
42	158	LU	Piping,Opr'G Floor - Steam	2.50	2.50
42	300	LU	BHEL Valve FO	0.50	0.50
42	358	LU	BHEL Valve Opr'G	0.40	0.40
			Sub-Total	**13.00**	**13.00**
			Total for two units	**26.00**	
			Tanks and Vessels		
81	003	LU	Cont Blow Down Expander-1500 mm OD	2.40	2.40
81	009	LU	Inter Blow Down Expander-2500 mm OD	6.50	6.50
			Sub-Total	**8.90**	**8.90**
			Total for two units	**17.80**	
			EWLI and MTM attachments		
97	088	LU	Electronic Level Indicator	1.50	1.50
97	297	HT	MTM Clamps and Pads	0.10	0.10
			Sub-Total	**1.60**	**1.60**
			Total for two units	**3.20**	
xx	xxx	LU	Feed Water Storage Tank & Accessories	56.50	56.50
xx	xxx	LU	Deaerating Heater & Accessories	17.00	17.00
			Sub-Total	**73.50**	**73.50**
			Total for two units	**147.00**	
			Total of Pressure Parts	**4912.84**	
B. Structures					
			Downcomer and Riser Supports		
07	410	HT	Downcomer Suspension	7.70	7.70
07	420	HT	Downcomer Guides	3.60	3.60

PG	MA	Stage	Brief Decsription	Design Wt (MT)	
				Unit-3	Unit-4
07	431	HT	Riser Pipe Support	2.20	2.20
			Sub-Total	**13.50**	**13.50**
			Total for two units	**27.00**	
			Buckstays & Furnace Guides		
08	101	HT	Furnace Upper Buckstay	51.90	51.90
08	104	HT	Furnace Intermediate Buckstay	42.70	42.70
08	107	HT	Furnace Lower Buckstay	29.70	29.70
08	111	HT	Furnace Rear Arch Buckstay	2.20	2.20
08	380	HT	Furnace Bottom Support	33.50	33.50
08	400	HT	Furnace Guide	12.60	12.60
08	500	HT	Furnace Back Pass Guide	58.00	58.00
08	700	LU	Ex.Movement Measurement Tramps	0.40	0.40
08	900	HT	Furnace Key Buckstays	3.10	3.10
			Sub-Total	**234.10**	**234.10**
			Total for two units	**468.20**	
			Fine Fittings & Boiler Trim Piping		
24	201	HT	Supports for Trim Piping	8.00	8.00
24	225	LU	Silencer Support	16.00	16.00
24	235	DL	Silencer & Support	1.00	1.00
24	346	HT	Hangers & Supports	2.60	2.60
24	351	HT	Hangers & Supports	0.10	0.10
			Sub-Total	**27.70**	**27.70**
			Total for two units	**55.40**	
			Boiler Enclosures etc.		
30	103	LU	Seal Plate Assy	2.30	2.30
30	105	LU	Furnace Bottom Enclosure	5.30	5.30
30	211	LU	Furnace Rear Arch Enclosure	1.90	1.90
30	212	LU	Furnace Extd Side Bottom Enclosure	6.70	6.70
30	215	LU	Main Boiler Enclosure	3.90	3.90
30	219	LU	Vertical Roof Enclosure	42.30	42.30
30	220	LU	Deck Supports etc.	21.30	21.30
			Sub-Total	**83.70**	**83.70**
			Total for two units	**167.40**	

PG	MA	Stage	Brief Decsription	Design Wt (MT)	
				Unit-3	Unit-4
			Main Boiler Structures		
35	010	DL	Foundation Materials-Boiler	9.70	9.70
35	110	DL	Main Columns Left	181.10	181.10
35	120	DL	Main Columns Right	181.10	181.10
35	130	DL	Main Columns Middle	84.30	84.30
35	140	DL	Auxiliary Columns-Left Side	63.40	63.40
35	150	DL	Auxiliary Columns-Rightside	64.80	64.80
35	160	DL	Airheater Columns	26.00	26.00
35	190	DL	Girder Pin Connections	4.60	4.60
35	210	DL	Boiler Ceiling Structure-Fabricated	264.10	264.10
35	220	DL	Boiler Ceiling Structure-Rolled Beams	60.80	60.80
35	230	DL	Boiler Ceiling Structure-Bracings	5.00	5.00
35	310	DL	Horizontal Bracing I MBL	21.40	21.40
35	320	DL	Horizontal Bracing II MBL	28.00	28.00
35	330	DL	Horizontal Bracing III MBL	39.80	39.80
35	340	DL	Horizondal Bracing IV MBL	24.70	24.70
35	350	DL	Horizondal Bracing V MBL	22.90	22.90
35	360	DL	Horizondal Bracing VI MBL	22.00	22.00
35	380	DL	Landing Platforms	32.60	32.60
35	390	DL	Platform at Drum Floor Level	22.80	22.80
35	441	DL	Horizontal Beams-Lower	160.00	160.00
35	443	DL	Horizontal Beams-Upper	60.00	60.00
35	511	DL	Front Bracing-Lower	25.80	25.80
35	513	DL	Front Bracing-Upper	13.20	13.20
35	521	DL	Side Bracing-Lower	70.00	70.00
35	523	DL	Side Bracing-Upper	36.80	36.80
35	531	DL	Rear Bracing-Lower	44.00	44.00
35	533	DL	Rear Bracing-Upper	16.70	16.70
35	700	DL	HSFG Fasteners	5.60	5.60
35	811	DL	Floor Grills and Guard Plate	80.70	80.70
35	821	DL	Stairs Lower	15.50	15.50
35	823	DL	Stairs Upper	11.00	11.00
35	851	DL	Hand Rails And Posts	35.10	35.10

PG	MA	Stage	Brief Decsription	Design Wt (MT)	
				Unit-3	Unit-4
35	993	DL	Consumables and erection materials	20.20	20.20
35	995	DL	Chute Pipe and Ladders	13.60	13.60
35	380	DL	Landing Platforms	3.10	3.10
			Sub-Total	**1770.40**	**1770.40**
			Total for two units	**3540.80**	
			Platforms, Stairs, Hand Rails, Roof etc.		
36	310	DL	Main MBL Floor 11th Level	31.30	31.30
36	311	DL	Main Floor I MBL 1st Pass	39.10	39.10
36	320	LU	Main Floor 12th Level	34.00	34.00
36	321	DL	Main Floor II MBL Ist Pass	27.30	27.30
36	322	DL	Main Floor II MBL 2nd Pass	13.80	13.80
36	330	LU	Main Floor 13th Level	26.80	26.80
36	331	DL	Main Floor III MBL 1st Pass	21.00	21.00
36	340	LU	Main Floor 14th Level	19.00	19.00
36	341	DL	Main Floor IV MBL 1st Pass	26.50	26.50
36	350	LU	Main Floor 15th Level	32.50	32.50
36	351	DL	Main Floor V MBL Ist Pass	15.70	15.70
36	352	DL	Main Floor V MBL 2nd Pass	9.90	9.90
36	360	LU	Main Floor 16th Level	10.00	10.00
36	361	DL	Main Floor VI MBL 1st Pass	18.70	18.70
36	391	LU/SYN	Miscellaneous Platforms-Part I	64.90	64.90
36	392	LU/SYN	Miscellaneous Platforms-Part II	85.00	85.00
36	393	LU/SYN	Miscellaneous Platforms Part III	32.00	32.00
36	610	LU	Boiler Roof Structure	114.10	114.10
36	611	LU	Boiler Roof Sheeting	25.00	25.00
36	612	SYN	Weather Protection For Burner Roof	28.00	28.00
36	620	SYN	Boiler Side Cladding Structure	38.00	38.00
36	621	SYN	Boiler Side Cladding Sheeting	14.60	14.60
36	740	DL/LU/SYN	Posts and Hangers	13.30	13.30
36	811	DL/LU/SYN	Floorgrills and guard plates-Lower	25.00	25.00
36	813	DL/LU/SYN	Floorgrills and guard plates-Upper	52.00	52.00
36	820	DL/LU/SYN	Stairs and Ladders	7.80	7.80
36	851	DL/LU/SYN	Handrails and Posts Lower	10.00	10.00

PG	MA	Stage	Brief Decsription	Design Wt (MT)	
				Unit-3	Unit-4
36	853	DL/LU/SYN	Handrails and Posts Upper	10.00	10.00
36	993	DL/LU/SYN	Consumables and erection Materials	5.00	5.00
			Sub-Total	**850.30**	**850.30**
			Total for two units	**1700.60**	
			Elevator & Mill handling structure		
38	110	SY	Elevator Columns	40.50	40.50
38	210	SY	Interconn Pltfrm	5.70	5.70
38	299	LU	Mill monorail	39.50	39.50
38	310	SY	Mill connect pltfrm	4.30	4.30
38	410	SY	Mill Maintnce pltfrm	61.50	61.50
38	510	LU	Elevator beams & brcng	27.80	27.80
38	610	LU	Cladding Str	14.80	14.80
38	611	SY	Cladding Sheet	10.10	10.10
38	710	SY	M/c Room deck	19.10	19.10
38	810	SY	FI Grills & Guards	18.50	18.50
38	820	SY	Stairs &Ladders	3.00	3.00
38	850	SY	HR Pipes & Posts	8.50	8.50
38	993	SY	Erection Matl	2.00	2.00
			Sub-Total	**255.30**	**255.30**
			Total for two units	**510.60**	
			External Structures		
39	012	DL	Foundation Materials	10.50	10.50
39	101	LU	Columns Frames before ESP	38.00	38.00
39	102	LU	Columns Frames before ESP	47.50	47.50
39	140	LU	Cols & Frms Near ID Fan	193.80	193.80
39	150	LU	Col & Frms Betn ID Fan & Chimney	30.70	30.70
39	300	LU	Platforms - External	64.50	64.50
39	301	LU	Struc & Platforms for Fans	6.00	6.00
39	302	LU	Struc for Motor Hood	7.40	7.40
39	303	LU	Monorail Beams for Fans	54.40	54.40
39	304	LU	Fan Handling Structures	24.60	24.60
39	305	LU	Fan Handling Structures	19.30	19.30
39	810	LU	Floor Grill	15.70	15.70

PG	MA	Stage	Brief Decsription	Design Wt (MT)	
				Unit-3	Unit-4
39	820	LU	Stairs	3.40	3.40
39	850	LU	Hand Rail Pipes & Posts	8.50	8.50
39	993	LU	Consumables & Erection Matl	10.80	10.80
			Sub-Total	**535.10**	**535.10**
			Total for two units	**1070.20**	
xx	xxx	LU	Structure & Platform for Deaerator & FST	8.00	8.00
			Sub-Total	**8.00**	**8.00**
			Total for two units	**16.00**	
80	921	LU	H&S for Boiler Light up-Steam Lines	4.00	4.00
80	922	LU	H&S for Boiler Light up-Nonsteam Lines	11.00	11.00
80	924	SYN	H&S for Synchronisation-Steam Lines	1.40	1.40
80	992	LU	Imported Electrodes	0.15	0.15
			Sub-Total	**16.55**	**16.55**
			Total for two units	**33.10**	
			Total of Structures	**7589.30**	
C. Non Pressure Parts					
			Seal Boxes		
09	001	HT	Seal Boxes	6.00	6.00
09	002	HT	Seal Boxes	2.20	2.20
09	003	LU	Material for Inst tapping	0.20	0.20
			Sub-Total	**8.40**	**8.40**
			Total for two units	**16.80**	
			Roof Skin Casing etc		
18	001	LU	Furnace Roof Skin Casing	10.50	10.50
18	010	HT	Pressure Parts Attachment	3.00	3.00
18	020	HT	Vibration Snubber	0.30	0.30
			Sub-Total	**13.80**	**13.80**
			Total for two units	**27.60**	
			Soot Blowers & Wall Deslaggers		
20	001	SY	Long Retractable Soot Blower	15.90	15.90
20	004	SY	Wall Box	0.60	0.60
20	201	SY	Wall Deslagger	9.60	9.60

PG	MA	Stage	Brief Decsription	Design Wt (MT)	
				Unit-3	Unit-4
20	204	SY	Wall Box	1.10	1.10
20	511	SY	DA Head Valve Assy	0.10	0.10
20	794	SY	Wall Box Non Retractable SB	0.00	0.00
20	972	LU	Temp Probe Duplex	0.70	0.70
20	988	SY	Commissioning Spares	0.10	0.10
20	998	SY	Special Tools	0.01	0.01
			Sub-Total	**28.11**	**28.11**
			Total for two units	**56.22**	
			Fine Fittings		
24	285	DL	Safety Valve/ERV Silencer	3.00	3.00
24	220	LU	Safety Valve Escape Pipe	16.50	16.50
24	700	HT	Bulked BPS Components	0.30	0.30
24	955	SY	Lapping Tools	0.10	0.10
24	960	SY	Lapping Tools	0.10	0.10
24	994	SY	Name Plates	0.20	0.20
			Sub-Total	**20.20**	**20.20**
			Total for two units	**40.40**	
			Furnace Doors		
28	220	LU	Doors	4.60	4.60
28	700	LU	BPS Fasteners	0.70	0.70
			Sub-Total	**5.30**	**5.30**
			Total for two units	**10.60**	
			Skin Casing		
31	010	HT	Skin Casing Components	3.40	3.40
31	102	LU	Fornace Bottom Skin Casing	1.00	1.00
31	104	LU	Furnace Rear Arch Skin Casing	5.50	5.50
31	105	LU	Second Pass Skin Casing	0.30	0.30
			Sub-Total	**10.20**	**10.20**
			Total for two units	**20.40**	
			Ignitors & Oil Guns		
41	350	LU	Air Cooled Oil Gun	0.80	0.80
41	390	LU	Oil Gun Vice Assy	0.80	0.80
41	500	LU	High Energy Arc Ignitor	0.50	0.50

PG	MA	Stage	Brief Decsription	Design Wt (MT)	
				Unit-3	Unit-4
41	988	LU	Oil & Gas Burner Commng Spares	0.00	0.00
			Sub-Total	**2.10**	**2.10**
			Total for two units	**4.20**	
			Fuel Oil Pipeline		
42	001	LU	Pneumatic Fittings	0.10	0.10
42	005	LU	Instrument Fittings	0.30	0.30
42	010	LU	LFO Pump Set	3.00	3.00
42	020	LU	HFO Pump Set	4.00	4.00
42	030	LU	HFO Heater Set	10.00	10.00
42	046	LU	Drain Oil Pump-Motor	0.20	0.20
42	065	LU	Drain Oil Tank	1.50	1.50
42	070	LU	Burner Station Skid	4.20	4.20
42	200	LU	Subdelivery Components	0.50	0.50
42	700	LU	BPS Fasteners	0.50	0.50
42	800	LU	Electric Tracer,	0.80	0.80
42	988	LU	Oil & Gas System Commng Spares	0.05	0.05
42	992	LU	Imported Electrodes	0.01	0.01
			Sub-Total	**25.16**	**25.16**
			Total for two units	**50.32**	
			Scanners		
43	004	LU	Assy Comp Scanner	1.50	1.50
43	005	LU	Assy Comp Mill Scanner	4.00	4.00
43	104	LU	M/C Comp Scanner	8.20	8.20
43	105	SY	M/C Comp Mill Scanner	27.80	27.80
43	200	LU	Sub-dely, Ignitor & Scanner	10.30	10.30
			Sub-Total	**51.80**	**51.80**
			Total for two units	**103.60**	
			Wind Box		
45	220	HT	Wind Box Assembly	62.00	62.00
45	221	LU	Wind Box Support	6.00	6.00
			Sub-Total	**68.00**	**68.00**
			Total for two units	**136.00**	
			Coal Pipline		

PG	MA	Stage	Brief Decsription	Design Wt (MT)	
				Unit-3	Unit-4
47	221	SY	Fuel Piping Supports	14.00	14.00
47	223	LU	Pipe Couplings, 'O' Rings	18.90	18.90
47	229	SY	St Pipes, Shop Bends	200.00	200.00
47	700	SY	BPS & Stoked Fasteners	0.90	0.90
xx	xxx	SY	Ceramic lined Bends, Elbows & Orifices	82.70	82.70
			Sub-Total	**316.50**	**316.50**
			Total for two units	**633.00**	
			Air & Flue Ducts		
48	012	LU	Rect Duct FD Fan O/L	65.00	65.00
48	014	LU	Expn Pieces FD Fan O/L	3.00	3.00
48	015	LU	Supports etc FD Fan O/L	6.00	6.00
48	019	DL	Foundation Matl	2.20	2.20
48	112	SB	Rect Ducts PA Fan O/L	37.70	37.70
48	114	SB	Expn Pieces PA Fan O/L	2.80	2.80
48	115	SB	Supports etc PA Fan O/L	2.00	2.00
48	141	SB	Seal Air HAG & Dampers	3.60	3.60
48	142	SB	Rect Duct Cold Air Bus	25.10	25.10
48	144	SB	Expn Pieces Cold Air Bus	0.80	0.80
48	145	SB	Supports etc Cold Air Bus	3.50	3.50
48	200	LU	Instrument Tapping	3.00	3.00
48	202	LU	Rect Ducts Airheater	47.70	47.70
48	204	LU	Expn Pieces Airheater	12.70	12.70
48	205	LU	Supports etc Airheater	4.20	4.20
48	207	LU	Flowmeters for Secondary Air	6.50	6.50
48	212	LU	Wind Box Connection	12.90	12.90
48	214	LU	Expn Pieces Windbox	3.50	3.50
48	222	LU	Rect Duct-Airheater	64.40	64.40
48	224	LU	Expn Pieces Airheaater	9.40	9.40
48	225	LU	Supports for Hot PA	11.70	11.70
48	382	HT	Rect Duct Economiser O/L	47.40	47.40
48	384	LU	Expn Pieces Economiser O/L	10.80	10.80
48	385	LU	Supports etc Economiser O/L	20.00	20.00
48	432	LU	Rect Duct APH Duct	40.00	40.00

PG	MA	Stage	Brief Decsription	Design Wt (MT)	
				Unit-3	Unit-4
48	434	LU	Expn Pieces APH Duct	5.00	5.00
48	435	LU	Supports etc APH Duct	2.50	2.50
48	462	LU	Rect Duct BOF to ESP	150.00	150.00
48	464	LU	Expn Pieces BOF to ESP	15.00	15.00
48	465	LU	Supports BOF to ESP Duct	22.00	22.00
48	482	LU	Rect Ducts-ESP O/L	74.30	74.30
48	484	LU	Expn Pieces ESP O/L	13.00	13.00
48	485	LU	Supports etc ESP O/L	9.40	9.40
48	492	LU	Rect Duct ID Fan O/L	145.00	145.00
48	494	LU	Expn Pieces ID Fan O/L	6.00	6.00
48	495	LU	Supports I.D.System Duct	8.00	8.00
48	662	SB	Rect Duct Hot Air	26.60	26.60
48	664	SB	Expn Pieces Hot Air	2.60	2.60
48	665	SB	Supports for Hot Air Duct	5.30	5.30
48	667	SB	Venturi-Primary Air	7.00	7.00
48	700	LU	Bulked BPS Components	2.60	2.60
48	993	LU	Erection Matl	3.80	3.80
			Sub-Total	**944.00**	**944.00**
			Total for two units	**1888.00**	
			Steam Coil APH		
50	510	LU	Steam Coil Airpreheater	5.50	5.50
			Sub-Total	**5.50**	**5.50**
			Total for two units	**11.00**	
			Gates & Dampers		
57	013	LU	DAMPERS BET FD FAN & APH	7.60	7.60
57	033	LU	DAMPERS APH BY-PASS	6.90	6.90
57	110	SYN	GUILLOTENE GATE PA FAN O/L	11.40	11.40
57	113	SYN	DAMPERS BETWEEN PA FAN & APH	3.70	3.70
57	143	SYN	DAMPER COLD AIR BUS	2.10	2.10
57	160	SYN	COLD AIR GATE, AIR BUS	7.50	7.50
57	161	LU	MANUAL OPERATED DAMPER	0.75	0.75
57	203	LU	DAMP APH TO WINDBOX	8.00	8.00
57	209	LU	LINKAGES FOR DAMPERS	3.60	3.60

PG	MA	Stage	Brief Decsription	Design Wt (MT)	
				Unit-3	Unit-4
57	223	LU	DAMP APH PRIMARY SIDE	3.30	3.30
57	270	LU	GUILLOTENE GATE DUCT	13.30	13.30
57	383	LU	DAMPER ECONOMISER TO APH	15.70	15.70
57	433	LU	DAMPER APH BOILER OUTLET	11.60	11.60
57	460	LU	GUILLOTENE GATE EP INLET	16.50	16.50
57	466	LU/SYN	PLATFORMS AND LADDER	14.00	14.00
57	480	LU	GUILLOTENE GATE EP O/L	32.90	32.90
57	490	LU	GUILLOTENE GATE ID FAN	15.80	15.80
57	491	LU	BLOWER WITH MOTOR	0.50	0.50
57	577	LU	ELECT ACTUATOR FOR GATES & DAMPERS	10.00	10.00
57	663	SYN	DAMPER HOT AIR BUS	5.40	5.40
57	988		COMMISSIONING SPARES	0.01	0.01
			Sub-Total	**190.56**	**190.56**
			Total for two units	**381.12**	
			Coal Feeder to Mill Connection		
67	272	SY	Coal Valve-36 inch	5.70	5.70
67	276	SY	Raw Coal Gate Chute	6.10	6.10
67	283	SY	Feeder Outlet Isolation Valve	7.50	7.50
67	400	SY	Seal Air Header Assembly	3.45	3.45
67	801	SY	Down Spout	16.00	16.00
67	803	SY	Feed Pipe to Mills	13.30	13.30
67			**Sub-Total**	**52.05**	**52.05**
			Total for two units	**104.10**	
97	599	LU	Pneumatic Actuators	3.50	3.50
			Sub-Total	**3.50**	**3.50**
			Total for two units	**7.00**	
99	099	SY	Misc Chain Pully Blocks	0.07	0.07
99	100	SY	Fan Handling Equipment	11.10	11.10
99	400	SY	SCAPH handling system	1.00	1.00
			Sub-Total	**12.17**	**12.17**
			Total for two units	**24.34**	
			Total of Non Pressure Parts	**3514.69**	

PG	MA	Stage	Brief Decsription	Design Wt (MT)	
				Unit-3	Unit-4
D. Rotating Machines					
			Air Preheater & Aux.		
52	010	LU	LARG AH-ROTOR ASSY	345.00	345.00
52	011	LU	LARG AH-ROTOR POST	15.56	15.56
52	012	LU	LARG AH-ROTORPINRACK	3.80	3.80
52	013	LU	LARG AH-ROTORSEALS	4.60	4.60
52	030	LU	LARG AH-ROTORHOUSING	43.10	43.10
52	041	LU	HOT END CONN PLATE	39.75	39.75
52	042	LU	COLD END CONN PLATE	60.10	60.10
52	054	LU	LARG AH-AXIAL SEAL	0.42	0.42
52	055	LU	LARG AH-BY PASS SEAL	0.88	0.88
52	100	LU	LARGE AH ROTOR DRIVE	5.70	5.70
52	210	LU	LARG AH-ACCESS DOOR	1.10	1.10
52	211	LU	LARG AH-AIRSEAL PIPE	0.68	0.68
52	212	LU	LARG AH-OBSER. PORTS	0.09	0.09
52	217	LU	LARG AH-STOP.ALARMS	0.06	0.06
52	220	LU	LARG AH-GENS DETAILS	9.11	9.11
52	261	LU	LARG AH-GUIDE BEARNG	2.93	2.93
52	262	LU	LARG AH-SUPRT BEARNG	4.26	4.26
52	271	LU	OIL PIPING GUIDE BRG	0.52	0.52
52	272	LU	OIL PIPING SUPRT BRG	0.54	0.54
52	274	LU	LUB OIL CIRCULN UNIT	1.23	1.23
52	301	LU	WASH MANIFLD GAS INL	0.51	0.51
52	302	LU	WASH MANIFLD GAS OUT	0.48	0.48
52	326	LU	CLEANING EQPT GAS OUT	0.34	0.34
52	329	LU	CLNG EQPT DRIVE UNIT	1.57	1.57
52	360	LU	FIRE SENSING SYSTEM	0.09	0.09
52	600		LARGE AH ELEC, C&I COMPONENTS	0.13	0.13
52	988	LU	LARG AH COMMG SPARES	0.30	0.30
			Sub-Total	**542.83**	**542.83**
			Total for two units	**1085.65**	
			FANS		
			FD & PA Fans		

PG	MA	Stage	Brief Decsription	Design Wt (MT)	
				Unit-3	Unit-4
55	011	LU	FD FAN FOUNDATION MA	1.55	1.55
55	031	SYN	PA FAN FOUNDATION MA	1.00	1.00
55	214	LU	1REAC FD FAN 1600-2000	14.00	14.00
55	334	SYN	2 REACT PA FAN	23.50	23.50
55	810	LU	AXIAL FD FAN COUPLING	0.80	0.80
55	830	SYN	AXL PA FAN COUPLING	0.90	0.90
55	910	LU	AXL FD FAN & ACCESSORY	4.50	4.50
55	911	LU	AXIAL FD FAN SILENCER	25.00	25.00
55	930	SYN	AXIAL PA FAN & ACCESSORY	4.50	4.50
55	931	SYN	PA FAN SILENCER	30.00	30.00
			Sub-Total	**105.75**	**105.75**
			Total for two units	**211.50**	
			ID Fan		
56	021	LU	ID FAN FOUNDATION MATL	2.70	2.70
56	027	LU	ID FAN C&I ITEMS	0.10	0.10
56	172	LU	BAC 1 SUC IGNTR FAN	5.20	5.20
56	227	LU	ID FAN ASSY NDZV33SI	80.00	80.00
56	920	LU	RAD IDFAN ACCESSORY	2.80	2.80
56	988	LU	RADIAL FAN COMMG SPA	0.03	0.03
			Sub-Total	**90.83**	**90.83**
			Total for two units	**181.65**	
			Seal Air & Ignitor Air Fans		
56	077	LU	SEAL AIR FAN C&I ITEMS	0.06	0.06
56	161	LU	BAC 1 SUC SEAL AIR FAN	0.75	0.75
56	670	LU	IGNITOR FAN MOTOR	1.00	1.00
56	870	LU	SEAL AIR FAN COUPLING	0.10	0.10
			Sub-Total	**1.91**	**1.91**
			Total for two units	**3.82**	
			Bowl Mill		
61	080	SYN	Journal Assembly	65.46	65.46
61	180	SYN	Mill Drive and Bowl Assembly	143.34	143.34
61	280	SYN	Mill Side and Liner Assembly	90.84	90.84
61	380	SYN	Classifier Assembly	100.74	100.74

PG	MA	Stage	Brief Decsription	Design Wt (MT)	
				Unit-3	Unit-4
61	480	SYN	MDV Assembly	18.90	18.90
61	780	SYN	Mill Motor Coupling	1.32	1.32
61	880	SYN	Tools & Accessories with Mill Handling System	20.00	20.00
61	980	SYN	Foundation Fastener Assembly	32.00	32.00
61	988	SYN	Commissionning Spares	0.19	0.19
			Sub-Total	**472.79**	**472.79**
			Total for two units	**945.58**	
			Coal Feeder		
65	736	SYN	36 Inch Gravimetric Feeder	38.30	38.30
			Sub-Total	**38.30**	**38.30**
			Total for two units	**76.60**	
			Drive Motors		
XX	XXX	SYN	Drive Motors for Rotating M/c	90.00	90.00
			Sub-Total	**90.00**	**90.00**
			Total for two units	**180.00**	
			Total of Rotating Machines	**2684.80**	
E. Lining & Insulation					
			Fixing Components for Insulation		
32	010	HT	Fixing Comp for Boiler	5.50	5.50
32	110	LU	Fixing Comp for Boiler	4.50	4.50
32	120	SY	Fixing Comp for SB Piping	1.20	1.20
32	310	LU	Fixing Comp for Air Ducts	23.00	23.00
32	410	LU	Fixing Comp for AH Area	9.50	9.50
32	510	LU	Fixing Comp for ID System Ducts	50.00	50.00
32	710	SB	Fixing Comp for Oil Piping	1.70	1.70
			Sub-Total	**95.40**	**95.40**
			Total for two units	**190.80**	
			Insulation Wool, Refractory etc.		
33	021	LU	Blr Pr Parts Mineral Wool	89.50	89.50
33	121	LU	Blr Mountings Min Wool	9.00	9.00
33	126	SY	SB Pipes Min Wool	3.00	3.00
33	201	LU	Main Blr Formed Refractory	0.50	0.50

PG	MA	Stage	Brief Decsription	Design Wt (MT)	
				Unit-3	Unit-4
33	212	LU	Main Blr Castable Refractory	70.00	70.00
33	230	LU	Main Blr Pourable Refractory	140.00	140.00
33	321	LU	Air Ducts Min Wool	108.00	108.00
33	421	LU	Air Heater & Gas Duct Min Wool	27.00	27.00
33	521	LU	ID System Ducts Min Wool	51.00	51.00
33	721	SB	Oil System Min Wool	4.00	4.00
33	924	SB	Misc Eqpts Asbestos Cloths	0.20	0.20
33	970	LU	Misc Eqpts Expanded Metals	4.80	4.80
33	971	LU	Misc Eqpts Woven Wire Mesh	0.60	0.60
33	975	LU	Misc Eqpts Sealing Compound	0.20	0.20
			Sub-Total	**507.80**	**507.80**
			Total for two units	**1015.60**	
			Boiler Outer Casing		
37	010	LU	Boiler Outer Casing Supports	16.20	16.20
37	810	LU	Boiler Outer Casing	20.00	20.00
			Sub-Total	**36.20**	**36.20**
			Total for two units	**72.40**	
			L&I for Pipeline and Vessels		
81	300	LU	Fix Comp for Mainsteam Line Insulation	2.00	2.00
81	327	LU	Lightly Bonded Mineral Wool Material	15.00	15.00
81	341	LU	Sealing Compound-External Piping	0.10	0.10
81	350	LU	Aluminium Sheet-External Piping	5.20	5.20
			Sub-Total	**22.30**	**22.30**
			Total for two units	**44.60**	
			Total of Lining & Insulation	**1323.40**	
F. Piping					
			Boiler Piping		
24	316	LU	Reheater DeSH	2.00	2.00
24	345	HT	Main Steam Piping to boiler stop valve	16.70	16.70
			Sub-Total	**18.70**	**18.70**
			Total for two units	**37.40**	
			Boiler Piping		

PG	MA	Stage	Brief Decsription	Design Wt (MT)	
				Unit-3	Unit-4
80	342	LU	Aux Steam to SCAPH	3.20	3.20
80	343	SYN	Aux Steam to Sootblowers	1.60	1.60
80	344	LU	Aux.Steam to F.O.Pump House/Tank Heating	10.00	0.00
80	351	LU/SYN	Aux Steam to Unlisted Users-SG Scope	5.00	5.00
80	352	HT	HP Piping Drains-SG Scope	1.00	1.00
80	355	LU	Steam Tracing Line of HFO	4.00	0.00
80	364	LU	CBD Tank Vent to System	1.50	1.50
80	365	LU	CBD Tank Vent/SV Exhaust to Atmosphere	0.60	0.60
80	366	LU	IBD Tank Vent to Atmosphere	7.30	7.30
80	395	LU	Aux Steam to FO Atomising	0.40	0.40
80	418	LU/SYN	Erection Materials for Instruments	0.20	0.20
80	450	HT	CBD and Emergency Drum Drain	5.50	5.50
80	451	HT	Boiler Integral Piping Drains	1.30	1.30
80	453	LU/SB	LP Piping Drains-SG Scope	2.50	2.50
80	454	LU	SCAPH Drains	0.90	0.90
80	455	LU/SB/SYN	Drain From Ulisted Eqpt/Vessel-SG Scope	1.80	1.80
80	650	LU	Heavy Fuel Oil Main Lines	40.00	0.00
80	901	LU	SD Valves & Specialities-Boiler Lightup	1.00	1.00
80	905	LU	BHEL Valves-Boiler Lightup	6.20	6.20
80	907	SYN	BHEL Valves-Synchronisation	1.50	1.50
			Sub-Total	**95.50**	**41.50**
			Total for two units	**137.00**	
			Power Cycle and Other Piping		
80	301	SB	MS FROM BOILER STOP VALVE TO ESV	85.00	85.00
80	303	SB	MS HEADER TO AUX PRDS	8.70	8.70
80	304	SB	MS HEADER TO HPBP VALVE	6.30	6.30
80	307	SB	HP AND LP BYPASS WARM UP	1.10	1.10
80	310	SB	HRH FROM REHEATER TO INTERCEPTOR VALVE	128.00	128.00
80	312	SB	LPBP VALVE UPSTREAM FROM HRH	15.00	15.00
80	320	SB	CRH FROM TURBINE TO REHEATER	65.00	65.00
80	321	SB	HPBP VALVE TO CRH PIPING	5.20	5.20
80	322	SB	CRH PIPING TO DEAERATING HEATER	5.00	5.00
80	324	SB	CRH HEADER TO AUX.PRDS	1.00	1.00

PG	MA	Stage	Brief Decsription	Design Wt (MT)	
				Unit-3	Unit-4
80	335	SB	EXTRACTION STEAM TO DEAERATING HEATER	12.90	12.90
80	336	SB	EXTRACTION STEAM TO HP HEATER NO.1	2.90	2.90
80	337	SB	EXTRACTION STEAM TO HP HEATER-2	1.60	1.60
80	340	SB	AUX STEAM HEADER	1.20	1.20
80	341	SB	AUX STEAM HEADER INTERCONN BETWEEN UNITS	33.00	33.00
80	345	SB	AUX STEAM TO DEAERATING HEATER	1.40	1.40
80	346	SB	AUX STEAM TO SJAE - SG SCOPE	1.00	1.00
80	348	SB	AUX STEAM TO GLAND SEALS - SG SCOPE	0.50	0.50
80	369	SB	HP DRAIN FLASH TANK VENT TO SYSTEM	1.60	1.60
80	373	SB	AUX STEAM HEADER SV EXHAUST	1.20	1.20
80	420	LU	BOILER FEED PUMP SUCTION	8.50	8.50
80	421	LU	BOILER FEED PUMP RECIRCULATION	7.60	7.60
80	423	LU	BOILER FEED PUMP TO HPH INCLUDING BYPASS	43.10	43.10
80	424	LU	BFD BETWEEN HTRS AND GROUP PROTECTION	17.50	17.50
80	425	LU	BFD FROM FINAL HPH TO SG TP	63.50	63.50
80	430	LU	SPRAY WATER TO HPBP	1.30	1.30
80	431	LU	SPRAY WATER TO AUX PRDS	2.30	2.30
80	432	LU	SPRAY WATER TO BOILER DESH UPTO SG TP	3.10	3.10
80	446	LU	DEAERATING HEATER OVER FLOW AND DRAIN	2.90	2.90
80	452	LU	HP PIPING DRAINS - SG SCOPE	3.00	3.00
80	453	SB	LP PIPING DRAINS - SG SCOPE	2.00	2.00
80	600	LU	HIGH PRESSURE DOSING PIPING	0.60	0.60
80	601	LU	LOW PRESSURE DOSING PIPING	1.00	1.00
80	921	LU/SB/SYN	H & S FOR LIGHT UP STEAM LINE	32.00	32.00
80	922	LU/SB/SYN	H & S FOR LIGHT UP - NON STEAM LINES	18.00	18.00
80	923	LU/SB/SYN	H & S FOR STEAM BLOWING	15.00	15.00
80	924	LU/SB/SYN	H & S FOR SYNCHRONISATION-STEAM LINES	5.00	5.00
80	925	LU/SB/SYN	H & S FOR SYNCHRO NON STEAM LINES	8.00	8.00
80	992		IMPORTED ELECTRODES	0.25	0.25
			Sub-Total	**612.25**	**612.25**
			Total for two units	**1224.50**	
81	415	SYN	TEST THERMOWELLS	0.40	0.40
81	416	SYN	PERFORMANCE GUARANTEE TEST MATERIALS	0.60	0.60

PG	MA	Stage	Brief Decsription	Design Wt (MT)	
				Unit-3	Unit-4
			Sub-Total	**1.00**	**1.00**
			Total for two units	**2.00**	
			Field Instruments		
97	282	LU	Flowmeters	0.30	0.30
			Sub-Total	**0.30**	**0.30**
			Total for two units	**0.60**	
xx	xxx	SB/SYN	HP Bypass System	6.00	6.00
			Sub-Total	**6.00**	**6.00**
			Total for two units	**12.00**	
			Total of Piping	**1413.50**	

PG	MA	STAGE	DESCRIPTION	Unit # 3 (MT)	Unit # 4 (MT)
G. Electrostatic Precipitator					
77	501	LU	ROLL/SLIDE SUPPORTS	7.50	7.50
77	505	LU	ESP-SUB-DELIVERY COM	0.20	0.20
77	506	LU	INSULATOR HOUSING AS	17.79	17.79
77	508	LU	GAS DIST. ASSY	39.36	39.36
77	509	LU	GD-RAPPING MECHANISM	6.47	6.47
77	510	LU	GD_DRIVE ARRANGEMENT	0.43	0.43
77	511	LU	GAS SCREEN-EP	10.47	10.47
77	513	LU	EMIT SYST SUSPENSION	6.61	6.61
77	514	LU	SUPPORT INSULATORS	2.88	2.88
77	515	LU	EMITTING ELECTRODES	7.75	7.75
77	516	LU	EMIT ELECT RAPP MECH	13.97	13.97
77	517	LU	DRIVE ARGT. FOR EMIT	12.21	12.21
77	519	LU	COL ELEC SUSPENSION	39.60	39.60
77	520	LU	COLLECTING ELECTRODE	353.51	353.51
77	521	LU	EMIT SYS FRAME-TOP	45.69	45.69
77	522	LU	EMIT SYS FRAME BOTTOM	57.50	57.50
77	523	LU	INSPECTION DOORS	5.32	5.32
77	524	LU	SHOCK BARS	32.47	32.47
77	525	LU	COLL ELECT RAPP MECH	35.85	35.85
77	526	LU	COLL ELEC RAPP DRIVE	2.56	2.56
77	528	LU	ESP ROOF PANELS	55.81	55.81
77	530	LU	ELECTRICAL SD COMPTS	5.50	5.50
77	531	LU	GEARED MOTORS FOR RA	7.00	7.00
77	532	LU	EMIT SYS FRAME-MIDLE	51.60	51.60
77	537	LU	JUNCTION BOX & PUSH	1.00	1.00
77	542	LU	OUTER ROOF-EP	82.90	82.90
77	543	LU	HOPPER RIDGES	21.00	21.00
77	544	LU	HOPPER UPPER PART	135.00	135.00
77	545	LU	HOP MLD & LOWER PART	130.00	130.00
77	546	LU	INSULATOR SUPP PANEL	35.85	35.85
77	547	LU	ROOF PANEL ASSY	43.54	43.54

PG	MA	STAGE	DESCRIPTION	Unit # 3 (MT)	Unit # 4 (MT)
77	548	LU	CASING STRUCTURE	138.30	138.30
77	549	LU	CASING SHELL/PANEL	174.00	174.00
77	550	LU	INLET-OUTLET FUNNEL	85.52	85.52
77	555	LU	PENT HOUSE FOR E P	77.00	77.00
77	557	LU	SPLITTER & GUIDE VANES	14.01	14.01
77	559	LU	CONTROL ROOM-INSERTS	3.30	3.30
77	560	LU	CABLE-CABLE RACKS	265.00	265.00
77	561	LU	EP PERF TEST EQUIPT	0.40	0.40
77	562	LU	EARTHING,CABLE TRAYS	75.00	75.00
77	563	LU	ASH LEVEL INDICATOR	0.96	0.96
77	565	LU	APP PLATFORM-HOPPER	46.00	46.00
77	566	LU	WATER WASHING SYSTEM	1.13	1.13
77	567	LU	MIN WOOL FOR ESP INS	47.38	47.38
77	568	LU	FIXING COMP. FOR ESP	44.88	44.88
77	572	LU	INTERLOCKS-EP	1.00	1.00
77	573	LU	ELECTRICALLY OPERTD	2.50	2.50
77	577	LU	LT SWITCH BOARD/ESP	9.50	9.50
77	578	LU	BAPCON & ACCESSORIES	0.50	0.50
77	580	LU	FOUNDATION MATLS FOR	9.63	9.63
77	581	LU	SUPPOTING STRUCTURES	181.33	181.33
77	590	LU	HEATING ELEMENTS	1.50	1.50
77	592	LU	AUXILIARY CONTROL PA	9.00	9.00
77	593	LU	RAPPER CONTROL PANEL	0.60	0.60
77	988	LU	COMMISSIONING SPARES	0.04	0.04
77	996	LU	TOOLS & TACKLES	0.12	0.12
77	999	LU	INITIAL SPARES	1.00	1.00
			Sub-Total	**2456.91**	**2456.91**
			Total for two units	**4913.82**	
			Stairs & Galleries of ESP		
89	610	LU	EP GALLERIES&STAIRS	36.95	36.95
89	611	LU	ESP ROOF HANDRAILS	2.98	2.98
			Sub-Total	**39.93**	**39.93**
			Total for two units	**79.86**	
			Total of Electrostatic Precipitator	**4993.68**	

PG	MA	STAGE	DESCRIPTION	Unit # 3 (MT)	Unit # 4 (MT)
			Grand Total	**26432.21**	

NOTES:

1. THE LIST HEREINBEFORE IS TENTATIVE AND BEING FURNISHED AS GENERAL INFORMATION TO THE BIDDERS FOR THE PURPOSE OF TENDERING. THIS LIST SHALL NOT BE CONSTRUED AS COMPREHENSIVE SCOPE UNDER THIS TENDER SPECIFICATION. BESIDES THE SYSTEMS / PRODUCT GROUPS (PG) & MAIN ASSEMBLIES (MA) INDICATED HEREINBEFORE, THERE IS LIKELIHOOD OF ADDITION OF NEW ONES WHICH ARE ASSOCIATED WITH AND REQUIRED FOR COMPLETION OF THE SYSTEMS/PLANT EQUIPMENT UNDER THE SCOPE IN GENERAL. BIDDERS SHALL CARRY OUT THE WORK RELATED TO SUCH SYSTEMS/EQUIPMENT. THE AGREED ITEM RATES SHALL BE APPLICABLE FOR SUCH ITEMS OF WORK AND THEIR CLASSIFICATION FOR PAYMENT PURPOSE SHALL BE MUTUALLY AGREED BASED ON THE NATURE OF WORK.

2. THE WEIGHTS GIVEN HERE ARE TENTATIVE. THEY MAY CHANGE AFTER DETAILED ENGINEERING IS DONE.

3. BESIDES THE WEIGHTS AS AFORESAID, WEIGHTS OF ALL TEMPORARY PIPING, VALVES, PUMPS, TANKS AND OTHER MISCELLANEOUS EQUIPMENTS ETC FOR CARRYING OUT HYDRAULIC TEST, CHEMICAL CLEANING, STEAM BLOWING AND OTHER TESTS, AS STATED ELSEWHERE WILL GET ADDED. ALL SUCH TEMPORARY SYSTEMS SHALL BE TREATED AS NON-PRESSURE PARTS FOR THE PURPOSE OF PAYMENT. HOWEVER SUCCESSFUL BIDDER SHALL CARRY OUT ALL SUCH WORK ACCORDING TO SPECIFIC TECHNICAL REQUIREMENT (e.g. HIGH PRESSURE WELDING INCLUDING TIG WELDING, HEAT TREATMENT, NON-DESTRUCTIVE TESTING etc.) AS PER BHEL'S ADVICE.

APPENDIX – II
LIST OF MAJOR T&P AND MMD TO BE DEPLOYED BY THE CONTRACTOR

A: TOOL & PLANTS

SN	DESCRIPTION	CAPACITY (MINIMUM)	MINIMUM QUANTITY
1	Crawler Crane	75 MT	1 for each unit from the first month
2	Crawler/Tyre mounted Crane	18 MT	1 for each unit from the first month
3	Pick & Carry Crane	8 MT	3 (at least one from the first month)
4	Trailer with Prime Mover	20 MT	1
5	Trailer with Prime Mover	15 MT	2 (at least one from the first month)
6	**Passenger cum Goods Elevator to reach up to boiler drum floor**	1 MT	1 for each unit, to be deployed by the time of drum lifting
8	Air Compressor (Electric/Diesel operated)	140 CFM, 7 Kg/cm^2	1 from first month
9	Strand and Jack Arrangement for Boiler Drum Erection	Adequate to erect Boiler Drum	1 set
10	**Huck Installation Tool (Guns)**	For fastening 12 mm and 16 mm diameter Huck Bolts in ESP	12 mm – 2 sets, 16 mm – 1 set
11	**Hydraulic cum Electrical Hose Assembly for Huck Bolting machine**	For connecting Huck Power Rig with Installation Tools	1 set
12	TIG Welding Set	As required	As required
13	Plasma Cutting M/c	For cutting up to 10 mm thick Stainless Steel	As required
14	3-Phase Distribution Board with Complete Set Up for Drawl of Construction Power	As required	As required
15	Power Cable for drawl of Construction Power	As required	As required
16	Pre Heating / Stress Relieving Set (Heating Control Panel, Cables, Heating Elements, Thermometers etc.)	As required	As required
17	Radiography Arrangement with Radioactive Isotope Source	Iridium-192	2 sets
19	Theodolite of Required Accuracy	To ensure verticality of structural columns	1

APPENDIX – II
LIST OF MAJOR T&P AND MMD TO BE DEPLOYED BY THE CONTRACTOR

SN	DESCRIPTION	CAPACITY (MINIMUM)	MINIMUM QUANTITY
20	Self Drilling Cum Tapping Machine for Screws of Boiler Roof Sheets	As required	2
21	Chemical circulation pumps to handle acid solution, opr temp 80 deg cel, with drive motors, starter panel, cable, switch fuse unit etc. Suggested rating: 150 m^3, 120 – 150m WC, with 90 kw, 3000 rpm, 150 amps motor. However, contractor shall deploy the required capacity pump with accessories after obtaining written approval of BHEL.	As required	4 sets
23	Electro-hydraulic pipe bending machine	Up to 2″ Nb and 12 mm thick pipes	2 Sets
24	Welding Generator (Electrical)	300 Ampere rating	As required
25	Welding Generator (Diesel Operated)	300 Ampere rating	4 sets
26	Radiography Film Viewer	As required	As required
27	Hydraulic Pipe Bending Machine (manual)	For bending of pipes up to 50 mm Nb size	4 sets
28	Baking Oven with thermostat and temperature gauge for welding electrodes	As required	3
29	Holding Oven with thermostat and temperature gauge for welding electrodes	As required	3
30	Portable Oven for welding electrodes	As required	40
31	Electric Winch	3 Ton	8

APPENDIX – II
LIST OF MAJOR T&P AND MMD TO BE DEPLOYED BY THE CONTRACTOR

SN	DESCRIPTION	CAPACITY (MINIMUM)	MINIMUM QUANTITY
32	Electric Winch	1 Ton	6
33	Hand Winch	0.5 Ton	4
34	Scaffolding Materials	Suitable for working at various heights	Adequate qty for parallel working in multiple workfronts.
35	Profile making M/c	for aluminium sheet cladding work	As required
36	Nibbling M/c		As required
37	Shearing M/c		As required
38	Water Pump to lift water to top of boiler	for refractory and other required activities	1 Set
39	Portable Grinding M/c	As required	As required
40	Portable Drilling M/c	As required	As required
41	Chain Pulley Blocks	Up to 15 MT Capacity	As required
42	Fire retardant Tarpaulines	As required	As required
43	Fire Extinguisher	As required	As required

B: MEASURING AND MONITORING DEVISES (MMD):

AS PER REQUIREMENT TO BE FINALIZED AT SITE, SHALL MEET THE REQUIREMENTS AS PER FIELD QUALITY PLAN AND OTHER ERECTION, TESTING RELATED ACTIVITIES.

NOTE:
THE LIST INDICATED ABOVE IS ONLY SUGGESTIVE AND NOT EXHAUSTIVE. CONTRACTOR SHALL DEPLOY ALL OTHER T&P AND MMD AS WELL THAT ARE NECESSARY FOR PROPER EXECUTION OF WORK UNDER ERECTION & COMMISSIONING OF WORK UNDER THE SCOPE.

APPENDIX – III
LIST OF T&P TO BE ISSUED BY BHEL FREE OF CHARGES ON SHARING BASIS

SN	Description	Capacity	Quantity	Remarks
(i)	Heavy Lift High Reach (HLHR) Crane	See Note-1	1	See Notes
(ii)	Crawler Crane	~180 MT	1	To be deployed from second month.
(iii)	Crawler Crane	~100 MT	2*	To be deployed from second month. Also please see Note 5 here.
(iv)	Crawler Crane	~75 MT	2*	To be deployed from first month. Also please see Note 5 here.
(v)	Furnace Maintenance Platform (Sky Climber)	0.5 MT	1	See Note 6 here
(vi)	Pressurizing Pump	450 Kg/cm^2 & 600 Kg/cm^2	1 each	For hydraulic test of boiler & HP pipelines.
(vii)	Huck Power Rig	As required	1	For ESP work. See Note 7 here
(viii)	Induction Heating Equipment	As required	4	For welding of P-91 pipeline. See Note 7 here
(ix)	Air-leak test set up	As required	1	For lekage test of ESP
(x)	Fogging Machine / Air Blower	As required	1	For leakage test of Furnace and ducts

APPENDIX – III
LIST OF T&P TO BE ISSUED BY BHEL FREE OF CHARGES ON SHARING BASIS

Notes	
1	HLHR crane will be used generally for erection of boiler supporting structures including ceiling structures and equipment/components above boiler ceiling structure or components/equipment beyond the reach of other cranes or non-availability of other BHEL cranes or for activities that essentially require services of this crane as decided by BHEL. This crane will accordingly be deployed at appropriate time as decided by BHEL for suitable duration and for intended purpose.
2	All these cranes are to be used on sharing basis with other agencies working in the project. Contractor shall furnish his requisition for particular crane to BHEL sufficiently in advance to ensure proper planning and timely deployment. Decision of BHEL for allocation of cranes to different agencies in the project will be based on the overall interest of the project and priority of the activity. Such decision will be binding on the contractor.
3	Contractor shall make necessary arrangements like laying of sleepers; minor earth filling & consolidation; assembly & dismantling of heavy lift attachment, boom, jib etc for movement and operation of the crane.
4	BHEL will obtain all the aforelisted cranes on hiring basis including operating and maintenance crew. Bidder shall arrange for fuel (HSD) in his own cost. Since the cranes are to be used on sharing basis with other agencies of BHEL, the fuel/cost of fuel shall be shared in proportion to usage at mutually agreed rates.
5	Normally one crane each of 75 MT and 100 MT rating will be provided in each unit. Second crane in these categories will be issued only in contingency situations as decided by BHEL.
6	Contractor shall transport this equipment from BHEL stores, install, operate, carry out preventive as well as breakdown maintenance, dismantle after use and return to BHEL stores.
7	Certain tools / components / consumables for Huck Bolting M/c and Induction Heating M/c shall have to be arranged by the contractor in his cost. For further details, please refer Sections 4, 5 & 7 of SCC.

APPENDIX-IV

ANALYSIS OF UNIT RATE QUOTED

SN	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 & SEAL OF THE BIDDER

APPENDIX-V

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

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

SIGNATURE OF BIDDER

DATE:

APPENDIX–VI

FORMAT FOR DEPLOYMENT PLAN FOR MAJOR TOOLS AND PLANTS BY BIDDER

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

SIGNATURE OF THE BIDDER

DATE:

APPENDIX-VII

CONCURRENT COMMITMENTS OF BIDDER

SN	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

DATE

SIGNATURE OF THE BIDDER WITH SEAL

APPENDIX–VIII

DETAILS OF SIMILAR WORK DONE DURING THE LAST SEVEN YEARS

SN	FULL POSTAL ADDRESS OF CLIENT & NAME OF OFFICER IN 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 BILL OF QUANTITIES AND SCOPE OF WORK) AND COMPLETION CERTIFICATE IN SUPPORT OF THIS STATEMENT.

DATE

SIGNATURE OF BIDDER WITH SEAL