TENDER SPECIFICATION

BHEL:PSSR:SCT: 1319

FOR

Handling at Site Stores / Storage yard, Transportation to Site of Work, Erection, Testing and Commissioning of Complete Boiler consisting of Boiler Structures, Pressure Parts, its auxiliaries, Electrostatic Precipitator and Rotating Equipments, Including Supply and Application of Final Painting of 1 x 330TPH boiler

at

Rashtriya Ispat Nigam Limited

(RINL) –Visakhapatnam

PART – I TECHNICAL BID

BOOK NO :

BHARAT HEAVY ELECTRICALS LIMITED
(A Government of India Undertaking)
Power Sector – Southern Region
690, Anna Salai, Nandanam, Chennai – 600 035.

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BHARAT HEAVY ELECTRICALS LIMITED
(A Government of India Undertaking)
Power Sector, Southern Region
690, Anna Salai, Nandanam, Chennai – 35

Tender Specification No. BHEL:PSSR:SCT: 1319

Messrs Date :

Dear Sir,

Sub: Handling at Site Stores / Storage yard, Transportation to Site of Work, Erection, Testing and Commissioning of Complete Boiler consisting of Boiler Structures, Pressure Parts, its auxiliaries, Electrostatic Precipitator and Rotating Equipments, Including Supply and Application of Final Painting of 1 x 330 TPH boiler at Rashtriya Ispat Nigam Limited, Expansion Project at Visakhapatnam AP.

Please find enclosed one set of non-transferable tender documents of Tender Specification for the above work.

You are requested to go through the tender documents and offer your most competitive rate and submit the tender documents duly filled in as per procedure indicated in the tender specification along with requisite EMD of **Rs. 2,00,000/-** (**Rupees Two Lakhs only**) in the form of Demand Draft drawn in favour of M/s. Bharat Heavy Electrical Limited Chennai - 35.

Bids with Deviations from the tender conditions will be rejected.

A SEPARATE LETTER SHALL BE FURNISHED INDICATING THAT THERE ARE NO DEVIATIONS FROM THE TENDER CONDITIONS (As in Page 10.)

The completed quotations shall reach the office of the under signed on or before **16.09.08** at **15.00** Hrs. The Technical bids, will be opened on the same day at **15.30** hrs.

We shall separately intimate the date for opening the price bids only to those parties who are technically qualified.

You are requested to depute your authorized representative at the time of opening.

ANY REVISION OF RATES / PRICES WHATSOEVER AFTER THE TIME AND DATE MENTIONED IN TENDER SPECIFICATION FOR SUBMISSION OF COMPLETED QUOTATIONS SHALL NOT BE ENTERTAINED UNLESS CALLED FOR SPECIFICALLY BY BHEL.

.

Kindly acknowledge the receipt of the tender documents and confirm your participation.

Kindly note that BHEL reserves the right to reject any or all tenders without assigning any reason.

Thanking you,

Yours faithfully,
For and on behalf of
BHARAT HEAVY ELECTRICALS LIMITED

Additional General Manager / Contracts

This Tender document is not transferable.

Bharat Heavy Electricals Limited
(A Govt. of India Undertaking)
Power Sector – Southern Region
EVR Periyar Building
690 , Anna Salai, Nandanam, Chennai – 600 035.

SPECIAL INSTRUCTIONS TO BIDDERS

The Bidder must submit their bids as requested in a sealed cover prominently super scribing the Tender Specification number, due date and time of submission as mentioned in the **TENDER NOTICE**.

The following information shall be furnished by the Bidder along with their offer (Technical Bid cover)

01. Details of previous experience during the last five years indicating contract value, duration, completion period and present engagement as per G.C.C.

02. Organisation structure of the Company as per GCC.

03. Financial status of the firm enclosing balance sheet and profit and loss account for the past 3 years and certificate from the Company's Banker as per G.C.C

04. Turnover of the Company in last 3 financial years pertaining to this scope of work only.

05. Latest Income Tax clearance certificate.

06. **BIO DATA** of key personnel presently in the Rolls of the company and proposed site organization for carrying out the work including deployment of Engineers and Supervisors.

07. Declaration sheets as per Appendix of Tender Specification.

08. Checklist and Schedule of General particulars as per Appendix in GCC.

09. T & P owned/deployment details as per G.C.C.

10. Technical manpower deployment details as per G.C.C

11. Other relevant details as per GCC and checklist.

12. These terms and conditions will be read and construed along with General Conditions of contract and incase of any conflict or inconsistency between the General conditions and the Terms and conditions of the tender specification, the provisions contained in the Term and conditions (NIT, Rate Schedule, Common conditions, Special Conditions including Appendices) shall prevail.

13. THE BIDDERS ARE REQUESTED TO FURNISH THE DOCUMENTS LIKE COPIES OF LOIS, WORK ORDERS ETC PERTAINING TO THE EXPERIENCE INDICATED IN QUALIFYING REQUIREMENT, AS GIVEN BELOW.

14 . QUALIFICATION REQUIREMENT

a) The bidder should have executed erection and commng of Boiler and its associated Auxiliaries and Equipments of minimum capacity of 60 MW or above in a Power Plant during last seven years

or

The bidder should have executed renovation and modernization in Boiler pressure parts and auxiliaries of 60 MW or above capacity in atleast one unit in A Thermal Power Plant in the last 7 years.

b) The Bidder should have an average financial turnover of Rs. 498 lakhs for the last three years ending on 31.3.2007.

The bidder should have earned profit in any one of the last three financial years ending on 31.3.2007 and should have positive net worth as on 31.3.2007.

The bidder should submit audited Balance Sheet and Profit and Loss Account of the Company for the last three years ending on 31.3.2007 in support of the above requirement.

c) Notwithstanding the above, BHEL reserves the right to reject any tender or all the tenders for the reasons whatsoever beyond our control and the decision of BHEL is final.

d) Approval of the party by customer

e) LD / Penalty shall be leviable as per the applicable clauses of GCC.

15. TENDERERS HAVE TO FURNISH A DECLARATION SHEET INDICATING THAT THERE IS NO DEVIATION FROM THE TENDER CONDITIONS (AS IN PAGE 10). TENDERERS MAY FURTHER NOTE THAT THIS DECLARATION IS A PREREQUISITE FOR BHEL TO CONSIDER THEIR BIDS. BIDS SUBMITTED WITHOUT "**NO DEVIATION DECLARATION**" WILL BE REJECTED BY BHEL.

16. SAFETY PLAN

Bidder may further note that the submission of safety plan is a prerequisite for BHEL to consider their bids.

Bharat Heavy Electricals Limited
(A Govt. of India Undertaking)
Power Sector – Southern Region
EVR Periyar Building
690 , Anna Salai, Nandanam, Chennai – 600 035.

PROCEDURE FOR SUBMISSION OF SEALED BIDS

The Tenderers must submit their bids as required in two parts in separate sealed covers prominently super scribed 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.

Tenderers are requested to quote their rates, only in the price bid (part II) provided by BHEL. Quoting of rates in any other form / formats will not be entertained.

These two separate cover I & II (Part I and Part II) shall together be enclosed in a third envelope (Cover III) along with requisite EMD as indicated and this sealed cover shall be super scribed and submitted to Additional General Manager/Contracts at the above mentioned address before the due date as indicated. The Tenderers will be intimated separately in case any clarifications are required.

NOTE:

Tenderers are issued with 2 Nos. of Technical Bids, 2 Nos. of Price Bids and 2 Nos. of GCC booklet., out of which one set of each document shall be retained by them for their reference. Balance one set shall be submitted along with their offer as per procedure indicated above.

EMD amount for this Tender is Rs.2,00,000/- (Rupees Two lakhs only). This EMD amount shall be submitted in the form demand draft only drawn in favour of M/s. Bharat Heavy Electricals Limited, Chennai – 35.

EMD amount in the form of Bank Guarantee / fixed deposit receipt or in any other form will not be Accepted.

ANY REVISION OF RATES / PRICES WHATSOEVER AFTER THE TIME AND DATE MENTIONED IN TENDER SPECIFICATION FOR SUBMISSION OF COMPLETED QUOTATIONS SHALL NOT BE ENTERTAINED UNLESS CALLED FOR SPECIFICALLY BY BHEL.

Additional General Manager/Contracts.

Bharat Heavy Electricals Limited
(A Govt. of India Undertaking)
Power Sector – Southern Region
EVR Periyar Building
690 , Anna Salai, Nandanam, Chennai – 600 035.

TENDER NOTICE

Sealed Tenders are invited from reputed contractors with sufficient previous experience in the under mentioned similar nature of work:

Tender Specification No. BHEL:PSSR:SCT: 1319

Description	EMD
Handling at Site Stores / Storage yard, Transportation to Site of Work, Erection, Testing and Commissioning of Complete Boiler consisting of Boiler Structures ,Pressure Parts, its auxiliaries, Electrostatic Precipitator and Rotating Equipments , Including Supply and Application of Final Painting of 1 x 330 TPH boiler at Rashtriya Ispat Nigam Limited, Expansion Project at Visakhapatnam AP.	Rs.2,00,000/- (Rupees Two Lakhs only)

Cost of Tender Documents (Including all Taxes)	:	Rs.1040/-	
Sale Starts on	:	26.08.2008	
Sale closes on	:	15.09.2008	
Due date and Time for Submission	:	16.09.2008	15.00 Hrs.
Date and time for opening Of Technical Bids	:	16.09.2008	15.30 Hrs.

QUALIFICATION REQUIREMENT

a) The bidder should have executed erection and commng of Boiler and its associated Auxiliaries and Equipments of minimum capacity of 60 MW or above in a Power Plant during last seven years

or

The bidder should have executed renovation and modernization in Boiler pressure parts and auxiliaries of 60 MW or above capacity in atleast one unit in A Thermal Power Plant in the last 7 years.

b) The Bidder should have an average financial turnover of Rs. 498 lakhs for the last three years ending on 31.3.2007.

The bidder should have earned profit in any one of the last three financial years ending on 31.3.2007 and should have positive net worth as on 31.3.2007.

The Bidder should have an average financial turnover of Rs. 460 Lakhs for the last three years ending on 31.3.2007.

The bidder should have earned profit in any one of the last three financial years ending on 31.3.2007 and should have positive net worth as on 31.3.2007.

The bidder should submit audited Balance Sheet and Profit and Loss Account of the Company for the last three years ending on 31.3.2007 in support of the above requirement.

c) Notwithstanding the above, BHEL reserves the right to reject any tender or all the tenders for the reasons whatsoever beyond our control and the decision of BHEL is final.

d) Approval of the party by customer

e) LD / Penalty shall be leviable as per the applicable clauses of GCC.

Interested parties can get the Tender documents from the office of the Additional General Manager / Contracts on all working days by remitting the cost of tender documents either by Cash or A/c Payee Demand Draft drawn in favour of M/s. Bharat Heavy Electricals Limited, Chennai – 600 035. Money order, Cheques and Postal Orders will not be accepted.

Bharat Heavy Electricals Limited takes no responsibility for any delay, loss or non-receipt of tender documents sent by post and also reserves the right to reject any or all the tender without assigning any reason therefor.

TENDER NOT ACCOMPANIED BY THE PRESCRIBED EARNEST MONEY DEPOSIT IS LIABLE TO BE SUMMARILY REJECTED.

Kindly note that BHEL reserves the right to reject any or all tenders without assigning any reason.

Sealed tenders, complete in all respects shall be submitted duly super scribing the tender specification no and name of the work duly addressed to the Addl. General Manager / Contracts at the above address.

Additional General Manager/Contracts

TENDER SPECIFICATION : BHEL:PSSR:SCT:1319

CERTIFICATE FOR NO DEVIATION

I,_____ Of

M/s_____

hereby certify that there is no deviation from the Tender conditions either technical or commercial and I am agreeing to all the terms and conditions mentioned in the Tender Specification.

SIGNATURE OF THE TENDERER

OFFER OF CONTRACTOR

Additional General Manager/Contracts
Bharat Heavy Electricals Limited,
Power Sector : Southern Region
690, Anna Salai,
Nandanam,
Chennai – 600 035.

Sir,

I/We hereby offer to carry out the work detailed in Tender Specification No.**BHEL:PSSR:SCT:1319** issued by Bharat Heavy Electricals Limited, Power Sector : Southern Region, in accordance with the terms and conditions thereof.

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

1. Instructions to Tenderer

2. General Conditions of Contract

3. Special conditions of Contract

4. Other Section, Appendices and Schedules

I/We have deposited/forwarded herewith the Earnest Money Deposit/a sum of Rs.2,00,000/- (Rupee Two Lakhs only) vide DD.No. . Dt. which shall be refunded should our offer not be accepted. Should our offer be accepted, I/We further agree to deposit such additional sum which along with the sum of Rs.2,00,000/- (Rupee Two Lakhs only) mentioned above, make up the Security Deposit for the work as provided for in the Tender Specification within the stipulated time as may be indicated by BHEL, Power Sector : Southern Region, Chennai – 600 035.

I/We further agree to execute all the works referred to in the said documents upon the terms and conditions obtained or referred to therein and as detailed in the appendices annexed thereto.

DATE: CONTRACTOR:
PLACE: ADDRESS:

Witness with their address

Signature Name Address

PROJECT INFORMATION

01	OWNER	RASHTRIYA ISPAT NIGAM LIMITED VISAKHAPATNAM STEEL PLANT
02	PROJECT TITLE	1X330 TPH BOILER, 67.5 MW TURBINE , RINL – VSP, CPP Expansion
03	LOCATION	VISAKHAPATNAM SITUATED SOUTH OF NATIONAL HIGH WAY NO 5 AND THE EAST COAST RAILWAY LINE BETWEEN VISAKHAPATNAM AND CHENNAI LOACTED AT LATITUDE OF 17° 37´ N AND LONGITUDE OF 83° 12´ E
04	POWER STATION SITE	ELEVATION ABOVE MEAN SEA LEVEL (MSL) : 10.5 MTS
05	NEAREST RAILWAY STATION	DUVVADA ON THE VISAKHAPATNAM-CHENNAI LLINE ABOUT 1O KMS FORM THE PLANT AND 30 KMS FROM VISAKHAPATANM RAILWAY STATION
06	NEAREST CITY	VISAKHAPATNAM
07	NEAREST AIR PORT	VISAKHAPATANM (12 KMS)
08	NEAREST SEAPORT	VISAKHAPATANM (16 KMS)
09	ROAD APPROACH	NATIONAL HIGHWAY NO 5 IS ABOUT 5 KMS FROM SITE
10	DRY BULB TEMPERATURE	45 deg C
11	RELATIVE HUMIDITY	4 % (MIN) TO 100% (MAX)
12	ALTITUDE	10.5 M ABOVE MSL
13	AMBIENT RANGE	
14	MEAN AMBIENT TEMPERATURE	16.5 deg C
15	NORMAL/AVERAGE TEMP	35 deg C
16	MAXIMUM TEMPERATURE	45 deg C
17	RAIN FALL DATA	
18	RAIN FALL FOR 24 HOUR PERIOD	370 mm
19	HIGHEST MONTHLY RAIN FALL	606 mm
20	DESIGN WIND SPEED	35.2 Kmph
21	EARTH QUAKE FACTOR	THIS PALNT IS FALLING UNDER ZONE-II AS PER IS 1893

SECTION III

COMMON CONDITIONS OF CONTRACT FOR ERECTION WORK

3.1 SCOPE OF CONTRACT

3.1.1 The Intent of this specification is to provide erection and commissioning services for execution of projects according to most modern and proven techniques and codes. The omission of specific reference to any method and equipment or material necessary for the proper and efficient services towards installation of the Plant shall not relieve the contractor of the responsibility of providing such services, facilities to complete the project or portion of project awarded to him. The quoted rate shall deem to be inclusive of all such contingencies.

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

3.1.3 Provision of all types of labour, Supervisors, Engineers watch and ward as required, tools and tackles as required, consumables as required under various clauses of tender specification for handling transportation, erection, testing and commissioning.

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

3.1.5 Completion of work in time.

3.1.6 Good quality and accurate workmanship for proper performance of equipment / systems.

3.1.7 Preservation of all components at all stages of pre-assembly/erection/ till unit is handed over, as specified in detail in clause 3.11.0

3.1.8 The contractor shall provide one computer with accessories along with qualified operator for maintaining material issue, erection records etc., The operator will work under BHEL engineer instructions.

3.2 FACILITIES TO BE PROVIDED BY BHEL:

3.2.1 OPEN SPACE :

Open space for building a temporary office shed and contractor's stores shed will be provided free of hire charges. Contractor has to make his own arrangements for labour colony.

3.2.2 ELECTRICITY:

For construction purpose, Electricity of 415 V- 3 Phase Supply will be provided free of cost at one single point. Further distribution shall be arranged by the contractor for his office & Stores Shed and for construction at his cost.

3.2.3 WATER:

Water for construction purposes will be provided by BHEL at one point, free of charge.

3.2.4 TOOLS & TACKLES:

All the tools and tackles required for the complete erection of components shall be arranged by the contractor, except the T & P specified as BHEL scope.

3.2.5 CONSUMABLES:

Such of those consumables supplied under PGMA by manufacturing units will be provided by BHEL free of cost. All other electrodes, gases and consumables are to be arranged by the contractor at his cost. However Paint and thinner for preservative painting and nitrogen for chemical cleaning work will be supplied by BHEL free of cost.

3.3.1 CRANES:

The following T & P will be provided to the Contractor on sharing basis at free of cost.

Sl. No	Description	Qty
1.	75 T crane or suitable higher capacity crane	2 No
2	Huck Bolting Machine	1 No
3	Chemical Cleaning pumps with accessories	As required
4	Acid Transfer pump with accessories	As Required
5	High Pr.Hydro test Pump with accessories	1 No
6	Blower for Gas tightness test	1 No.

Note : i. For operation of high capacity crane (higher than 75 T) BHEL will provide crane operator. The contractor has to provide two assistant/helpers for operation of the cranes at his cost.

ii. For 75 T crane contractor has to arrange crane operator Fuel and Lubricant at his cost.

iii. Fuel required for operation of the higher capacity cranes shall be arranged by contractor at his cost.

In case BHEL provides hired cranes, the following fuel charges will be deducted from contractors bill.

a. 75 T Crane Rs. 150 per Hour
b. 135 or 150 T crane Rs. 250 per Hour
c. Higher capacity cranes Rs. 300 per Hour

3.3.2 CIVIL CONSTRUCTION:

It shall be the responsibility of the contractor to construct his own office shed, stores shed, with all facilities like Electricity, water supply, sanitary arrangements in the area allotted to him for the purpose.

3.3.3 WATER DISTRIBUTION:

Distribution of water for construction purpose and as well as drinking purpose shall be contractor's responsibility and at his cost.

3.3.4 ELECTRICITY DISTRIBUTION:

Provision of distribution of electrical power from the given single central common point to the required places with proper distribution boards, cables, etc. observing the safety rules laid down by electrical authority of the State / BHEL / their customer with appropriate statutory requirements shall be the responsibility of the tenderer / contractor.

3.3.5 POSSESSION OF GENERATORS :

As there are bound to be interruptions in regular power supply, power cut / load shedding in any construction sites, due to inherent power shortage in State on this account, suitable extension of time, if found necessary only be given and contractor is not entitled for any compensation. It shall be the responsibility of the tenderer / contractor to provide, maintain the complete installation on the load side of the supply with due regard to safety requirements at site. It shall be the responsibility of the contractor to have at least (2 to 4) diesel operated welding generator sets to get urgent and important work to go on without interruptions. The consumables required to operate the generators are to be provided by tenderers. This may also be noted while quoting.

3.3.6 LIGHTING FACILITY :

Adequate lighting facilities such as flood lamps, low volt hand lamps and area lighting shall be arranged by the contractor at the site of construction, contractor's material storage area etc. at his cost.

3.3.7 POWER DISTRIBUTION:

For the purpose of planning, contractor shall furnish along with tender the estimated requirement of power (month wise) for execution of work in terms of maximum KW demand.

3.3.8 CONTRACTOR'S OBLIGATION ON COMPLETION :

On Completion of work, all the temporary buildings, structures, pipe lines, cable etc. shall be dismantled and leveled and debris shall be removed as per instruction of BHEL by the contractor at his cost. In the event of his failure to do so, the expenditure towards clearance of the same will be recovered from the contractor. The decision of BHEL Engineer in this regard is final.

3.4 GASES :

3.4.1 All required gases like Oxygen/ Acetylene/ LPG/ Argon/ Nitrogen required for work shall be supplied by the Contractor at his cost. It shall be the responsibility of the contractor to plan the activities and store sufficient quantity of these gases. Non-availability of gases cannot be considered as reasons for not attaining the required progress.

3.4.2 BHEL reserves the right to reject the use of any gas in case required purity is not maintained.

3.4.3 The contractor shall submit weekly / fortnightly / monthly statement report regarding consumption of all consumables for cost analysis purposes.

3.4.4 The contractor shall ensure safe keeping of the inflammable cylinder at a separate place away from normal habit with proper security etc.

3.4.5 The contractor shall arrange air / gas manifold ensuring proper distribution and reduction of handling time.

3.5 ELECTRODES

3.5.1 BHEL will supply faller wire for welding wherever TIG welding is involved as free issue. All the required electrodes 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, suppliers, type of electrodes etc. On receipt of the electrodes at site, it shall be subject to inspection and approval by BHEL. The contractor shall inform BHEL details regarding type of electrodes, batch number and date of expiry etc.

3.5.2 Only TIG welding wire , as supplied from Units will be provided by BHEL free of cost.

3.5.3 Such of those consumables supplied under PGMA by manufacturing units will be provided by BHEL free of cost . All other electrodes including stainless steel electrodes required for shall be arranged by the contractor at his cost. The utilization of the TIG welding wires shall be duly accounted for exercising maximum care and ensuring economical usage for minimum wastage. If during erection, it is found that the consumption of filler wire is more than the actual requirement by improper usage, the cost for the additional quantity so consumed shall be recovered from the contractor.

3.5.4 Storage of electrodes shall be done in an air conditioned / humidity controlled room as per requirement, at his own cost by the contractor.

3.5.5 All low hydrogen electrodes shall be baked /dried in the electrode drying oven to the temperature and period specified by the BHEL Engineer before they are used in erection work and each welder should be provided with one portable electrode drying oven at the work spot. Electrode drying oven and portable drying ovens shall be provided by contractor at his cost.

3.5.6 In case of improper arrangement of procurement of above electrodes BHEL reserves the right to procure the same from any source and recover the cost from the contractor's first subsequent bills at market value plus departmental charges of BHEL communicated from time to time. Postponement of such recovery is not permitted.

3.5.7 BHEL. reserves the right to reject the use of any electrodes at any stage if found defective because of bad quality, improper storage, date of expiry, unapproved type of electrodes etc. It shall be the responsibility of the contractor to replace at his cost without loss of time.

3.5 TOOLS & TACKLES

3.6.1 BHEL will provide free of hire charges on sharing basis the tools and plants indicated in Appendix . It may be noted that distribution of these equipments will be done by BHEL Engineers and the decision of the Engineer shall be final in this regard.

3.6.2 The Contractor shall be responsible for the safe and proper use of the above equipments issued to him. Day-to-day maintenance and operation of the equipments shall be the contractor's responsibility and shall be as per instructions/standard practice of BHEL Engineer.

3.6.3 Any loss/damage to any or part of the above equipments shall be to contractor's account and the expenditures on these account will be recovered from contractor's bills in case contractor fails to make good the loss.

3.6.4 Necessary electrical / water / air connection required for operation of any of the above equipment shall be Contractor's account.

3.6.5 Non-availability of any of the above equipment either due to breakdown/routine maintenance or due to distribution pattern of BHEL shall not be quoted as reason for delay of work.

3.6.6 Monthly utilisation report of the above equipment shall be furnished by contractor for cost analysis purpose.

3.6.7 The contractor shall return the T & P issued to him by BHEL in good working condition as and when so desired by BHEL. (Completion or reduction in work load) for diversion for other work. If such return is delayed by contractor due to his fault without written consent of BHEL, hire charges as applicable according to BHEL policy will be levied from such time it was requisitioned by BHEL to the time of actual return and the amount so decided and arrived at, will be recovered from the contractor's bill.

3.6.8 All other T & P required for the satisfactory execution of work shall be arranged by contractor.

3.6.9 All the T & P arranged by contractor including electrical connections wherein required shall be reliable / proven / tested with necessary test certificate.

All instruments, measuring tools etc. are to be calibrated periodically as per the requirement of BHEL and necessary calibration certificates are to be submitted to BHEL before use.

3.6.10 The contractor has to return the T & P in good working condition and cost of any replacement required has to be borne by the contractor.

3.6.11 Contractor shall have at all times experienced operators and technicians for routine and breakdown maintenance of the equipment. Any delay in rectification of defects will warrant BHEL rectifying the defect and charging the cost to the contractor.

3.6.12 If at any time it is noticed that contractor is not using any of the T & P or equipment properly according to the instructions of BHEL, BHEL will have the right to withdraw any and all such equipment and any cost due to this shall be contractor's account.

3.6.13 All the T & P would be issued only at BHEL stores and it shall be the responsibility of the contractor to take delivery from BHEL stores, transport the same to site and return the same to BHEL stores in good condition after use.

3.6.14 All the T & P, lifting tackles including wire ropes, slings, shackles and electrically operated equipment shall be got approved by BHEL Engineer before they are actually put on use. Test certificates should be submitted before their usage.

3.6.15 The list of major T & P required to be deployed by the contractor is indicated in appendix. The list is minimum and not exhaustive but anything required over and above these to suit the site condition / rate of progress / nature of work shall be arranged by contractor at his own cost.

3.6.16 Contractor shall take into consideration the above clause and quote the rates as called for in the Rate Schedule.

3.6.17 During the execution of the work, it become necessary for the contractor to deploy his manpower for reduction/increasing the boom length of the crane to suit the erection condition. It shall be the indenting contractor's responsibility to arrange for necessary manpower / hand tools / illumination / supports / consumables, etc. and the quoted rate shall include such services. Similarly, all assistance required during preventive maintenance shall be provided by the contractor.

3.6.18 For the movement of cranes, etc., it may become necessary to lay sleeper bed for obtaining leveled safe approach for use of equipment. It shall be the contractor's responsibility to lay necessary sleepers. The required sleepers are to be arranged by the contractor at his cost. BHEL will not supply any sleepers for this activity.

3.6.19 Contractor shall make good any loss or damage to the equipments supplied to him and day to day maintenance and operations of equipments shall be borne by the contractor including all consumables like petrol, diesel, oil and air filters etc.

3.6.20 The availability of crane are likely to be hampered from time to time due to routine preventive maintenance or breakdown maintenance. Contractor has to make alternative arrangements or plan / amend / alter his activities with the consent of BHEL Engineer to suit the above conditions and the contractor will not be liable for any compensation due to this.

3.6.21 The contractor has to keep and maintain a log book every day which will be provided by BHEL and this has to be countersigned by BHEL Engineer every day.

3.7 SUPERVISORY STAFF AND WORKMEN

3.7.1 The Contractor shall deploy experienced Engineers, Supervisors all the skilled workmen like High Pressure Welders (gas, TIG and arc) Carbon, alloy steel welders, Gas cutters, electricians, Riggers, Serangs, Erectors, carpenters, fitters etc. in addition to other skilled semi-skilled and unskilled workmen required for all the works of handling and transportation from site storage to erection site,

transportation, erection, testing and commissioning contemplated under this specification. Only fully trained and competent men with previous experience of the job shall be employed. They shall hold valid certificates wherever necessary. BHEL reserves the right to decide on the suitability of the workers and other personnel who will be employed by the contractor, BHEL reserves right to insist on removal of any employee of the contractor at any time, if they find him unsuitable and the contractor shall forthwith remove him.

3.7.2 The supervisory staff employed by the contractor shall be qualified (Engineers – Graduates in Engineering and Supervisors – Diploma Holders) and experienced in the area of work. They shall ensure proper out-turn of work and discipline on the part of labour put on the job by the contractor and in general see that the works are carried out in safe and proper manner and in coordination with other labour and staff employed directly by BHEL or BHEL's client.

3.7.3 The Contractor shall also furnish daily labour report showing by classification the number of employees engaged in various categories of work and a progress report of work as required by BHEL Engineer. The contractor shall also give a summary report at the end of the month and plan of deployment for the consequent month as per the plan of activities as required by BHEL, to meet the overall contract requirement.

3.7.4 The work shall be executed under the usual conditions existing in major power plant construction and in conjunction with numerous other operations at site. The bidder and his personnel shall co-operate with other personnel other contractor coordinating his work with others and proceed in a manner that shall not delay or hinder the progress of work as a whole.

3.7.5 The contractor's supervisory staff shall execute the work in the most substantial and workman like manner in the stipulated time. Accuracy of work, good workmanship and aesthetic finish are essential part of this contract. The contractor shall be responsible to ensure that assembly and workmanship conform to the dimensions and tolerances given in the drawings/instructions given by BHEL Engineers from time to time. Wherever finish or tolerances are not specified in drawings/documents, BHEL Engineers instruction are taken as final.

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

3.7.7 It is the responsibility of the bidder to engage his workmen in shifts or on overtime basis for achieving the target set by BHEL and also during erection, commissioning and testing period. The contractor's quoted rate shall include all these contingencies.

3.7.8 If the contractor or his workmen or employees shall break, deface, injure or destroy any part of a building, road, kerb, fence, enclosure, water pipes, cables, drains, electric or telephone posts or wires, trees or any other property or to any part of the erected components etc. The contractor shall make the same good at his own expense or in default, BHEL may cause the same to be made good by other workmen or by other means and deduct the expenses (of which BHEL's decision is final) from any money due to the contractor.

3.8 CIVIL WORKS

3.8.1 Column foundation and foundation of other plants and necessary civil works shall be provided by BHEL. The dimension of the foundation and anchor bolt pits shall be checked by the contractor for their correctness as per drawings. Further, top elevation of foundations shall be checked with respect to bench mark etc. All adjustments of foundations surfaces, enlarging the pockets in foundations etc. as may be required for the erection of equipments plants shall be carried out by the contractor.

3.8.2 The contractor at his cost shall arrange for grouting of foundation bolt holes of column and equipment as specified in the drawings / specification or as advised by the Engineer of BHEL after preparing the foundation top surface for grouting, All the materials for grouting (sand, gravel & cement including special Cement) shall be arranged by the contractor. The grouting has to be done up to basement level. The required consumables like Portland cement, gravel, sand etc., have to be provided by the contractor at his cost. Special cement like Conbextra, GP2 / Shrinkomp or its equivalent shall be arranged by the contractor at his cost.

3.8.3 The contractor at his cost shall arrange for grouting of anchor points of T & P issued to him and also grouting of winches or any other supports required for T & Ps. Necessary grout materials are to be arranged by the contractor at his cost.

3.9 SCOPE OF MATERIAL HANDLING AND SITE STORAGE AND OTHER RESPONSIBILITIES

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

3.9.2 The contractor shall identify necessary supervisor/labour for the above work in sufficient quantity as may be needed by BHEL for areas covering their scope.

3.9.3 It shall be contractor's responsibility to arrange necessary cranes/tractors, trailor or trucks/slings/tools and tackles/labour including operators for loading the materials/Equipments from stores/storage yard, move it to erection site/pre-assembly yard and unload the same at pre-assembly yard/ erection site and the quoted rate shall include the same.

3.9.4 All equipment so used by contractor shall be of proven quality and safe in operation as approved by the statutory authorities as per the law in force.

3.9.5 Any loss/damage to materials issued to contractor shall be made good by him or BHEL will arrange for replacement at cost recovery basis and decision of BHEL shall be final.

3.9.6 All welding filler wires if issued to the contractor shall be preserved by him carefully to prevent deterioration of their properties. Special care shall be taken to preserve alloy steel and other special electrodes / filler wires. Contractors shall exercise maximum care in using these electrodes, filler wires to minimize wastage by maintaining a record of all usages.

3.9.7 All pipe and tube ends shall be covered with plastic caps or will be closed with wooden plugs as the case may be.

3.9.8 All the surplus damaged, unused materials, package materials/containers/special transporting frames, gunny bags etc. supplied by BHEL shall be returned to the BHEL Stores by the contractor and maintain records.

3.9.9 The contractor shall take delivery of the components and equipments and special consumables from the storage area after getting the approval of the BHEL Engineer on standard indent forms to be specified by BHEL. At periodic/intervals of work, complete and detailed account of the equipment so erected and electrodes used shall be submitted to the BHEL Engineer.

3.9.10 The contractor shall submit monthly plan for erection and the same will be mutually agreed upon after discussion. The contractor shall arrange for Engineers, Supervisors and labour force and tools and plants and consumables to suit the above plan and execute the work accordingly.

3.9.11 The Contractor shall have total responsibility for all equipment and materials in his custody, stores, loose, semi-assembled, assembled or erected by him at site.

3.9.12 The contractor shall make suitable security arrangement including employment of security personnel to ensure the protection of all materials/equipments and works from theft, fire, pilferage and any other damage and loss.

3.9.13 The contractor shall ensure that the packing materials and protection devices used for the various equipments during transit and storage are removed before these equipments are installed.

3.9.14 All equipments shall be handled very carefully to prevent any damage or loss. No bare wire ropes, slings etc. shall be used for unloading and / or handling of the equipments without the specific written permission of the Engineer. The equipments from the storage yard shall be moved to the actual site of erection / location at the appropriate time as per the direction of BHEL Engineer so as to avoid damage for such equipments at site.

3.9.15 The work covered under this scope of work is of highly sophisticated nature requiring best quality / precision workmanship engineering and construction management. He should also ensure successful and timely commercial operation of equipment installed. The contractor must have adequate quantity of precision tools, construction aids in possession. Contractor must also have adequate trained qualified and experienced supervisory staff and skilled personnel.

3.9.16 All the necessary certificates and licenses required to carry out this scope of work are to arranged by the contractor then and there at no extra cost.

3.9.17 The contractor shall take all reasonable care to protect the materials and work till such time the erected equipment has been taken over by BHEL/their client. Wherever necessary suitable temporary fencing and lighting shall have to be provided by the contractor as a safety measure against accident and damage of property of BHEL. Suitable caution notices shall be displayed where access to any part may be deemed to be unsafe and hazardous.

3.9.18 The contractor shall be responsible for taking all safety precautions during the construction and keeping the site safe at all times. When the work is temporarily suspended he shall protect all construction materials, equipments and facilities from causing damage to existing property interfering with the operations of the station when it goes into services. The contractor shall comply with all applicable provisions of the safety regulations clean-up programme and other precautionary measures which the BHEL has in effect at the site.

3.9.19 All lifting tackles including wire ropes, slings, shackles etc. used by the contractor shall be got approved by BHEL Engineer at site before they are actually put on the work. It will be the responsibility of the contractor to ensure safe lifting of the equipment taking due precautions to avoid any accidents and damage to other equipments and personnel. All piping shall be adequately supported and protected to prevent damage during handling and erection. The history cards for major equipments to be maintained by the contractor.

3.9.20 The contractor shall take delivery of equipment from storage yard/stores/sheds. He shall also make arrangements for verification of equipment, maintain records and keep safe custody watch and ward of equipment after it has been handed over to him till these are fully erected, tested and commissioned and taken over by BHEL's client. The stolen/lost/damaged goods shall have to be made good by the contractor at his own cost.

3.9.21 Sometimes it may become necessary for the contractor to handle certain un required components in order to take out the required materials. The contractor has to take this contingency also into account. No extra payment is payable for such contingencies.

3.10 WELDING

3.10.1 All welders shall be tested and approved by BHEL Engineer before they are actually engaged on work though they may possess the required certificate. BHEL reserves the right to reject may welders without assigning any reason.

3.10.2 BHEL Engineer is entitled to stop any Welder from the work if his work is unsatisfactory for any technical reasons or there is a high percentage of rejection of joints welded by him, which in opinion of the BHEL Engineer will adversely affect the quality of the welding though the welders has earlier passed the tests prescribed by BHEL Engineers. The welders having passed qualification tests does not relieve the contractor of a contractual obligation to check the welders performance.

3.10.3 All charges towards testing of welders for destructive and non-destructive test, testing and approval of welders for engaging in the erection work shall be borne by the contractor.

3.10.4 All welded joints shall be subjected to acceptance by BHEL Engineer.

3.11. PRESERVATION OF COMPONENTS

3.11.1 It shall be the responsibility of the contractor to apply touch up painting on all equipment before erection. It shall be contractor's responsibility to arrange for required labour, brush and other consumables like cotton waste, cloth etc. for carrying out preservative painting. The quoted rate shall inclusive of above work. The required paint (red oxide) and thinner shall be arranged by BHEL at free of cost.

3.11.2 The contractor shall effectively protect the finished work from action of weather and from damage or defacement and shall cover the finished parts, then and there for their protection.

3.11.3 Any failure on the part of contractor to carry out work according to above clauses will entail BHEL to carry out the job from any other party and recover the cost from contractor.

3.11.4 Due to atmospheric conditions erected materials are likely to get rusted more frequently. It is the responsibility of the contractor to preserve the erection materials drawn from stores for erection till these are commissioned and handed over to customer. The required paint (Red oxide) and thinner shall be arranged by the contractor at his cost. All other consumables like painting brush, emery paper, cotton waste, cloth etc. have to be procured by the contractor at his cost. The contractor should ensure that the materials are not rusted on any account till they are handed over to customer. The decision of the BHEL Engineer is final with regard to frequency of application of paint.

3.12.0 DRAWINGS AND DOCUMENTS

3.12.1 The detailed drawing specification available with BHEL Engineers will form part of this tender specification. These documents will be made available to the contractor during execution of work at site.

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

3.12..3 The data furnished in various appendices and the drawings enclosed with this Tender Specification, describes 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 scales of work.

3.12.4 Should any error or ambiguity be discovered in the specification, or information, the contractor shall forthwith bring the same to the notice of BHEL before commencement of work. BHEL's interpretation in such cases shall be final and binding on the contractor.

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

3.13.0 SAFETY AND CLEANLINESS

3.13.1 Contractor shall strictly follow all safety regulations/conditions as per clause 2.15 and its sub clauses of general conditions of contract booklet enclosed with this tender.

3.13.2 Non-conformity of safety rules and safety appliances will be viewed seriously and the BHEL has right to impose fines on the contractor as under:

Sl.No.	Safety measures	Fine (Rs.)
01,	Not wearing safety helmet	50/-
02	Not wearing safety belt	100/-
03	Grinding without goggles	50/-
04	Not using 24V supply for internal work	500/-
05	Electrical plugs not used for hand machines	100/-
06	Not slinging properly	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 properly	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 elec. Winches which are being operated dangerously	500/-
13	Improper earthing of electrical T & Ps	500/-

3.13.3 Contractor shall necessarily fill up the safety plan format available in general conditions of contract booklet enclosed with this tender and submit along with their offer.

3.13.4 CONTRACTOR SHALL DEPLOY A SAFETY OFFICER EXCLUSIVELY TO HANDLE SAFETY REQUIREMENT.

SPECIFIC REQUIREMENTS FOR ISO 9001 - 2000

3.14.0 IMPORTANT NOTE

Contractors shall ensure that all their Staff/Employees are exposed to periodical training programme conducted by qualified agencies/ personnel on ISO 9001 – 2000 Standards.

Contractors shall ensure that the Quality is maintained in all the works connected with this contract at all stages of the requirement of BHEL.

Contractor shall ensure that all Inspection, Measuring and Testing equipment that are used, whether owned by the contractor or used on loan, are calibrated by the authorized agencies and the valid calibration certificate will be available with them for verification by BHEL. A list of such instruments possessed by contractor at site with its calibration status is to be submitted to BHEL Engineer for control.

Contractors shall arrange for the inspection of the works at various stages as required by BHEL. Immediate corrective action shall be taken by the contractor for the non-conformances if any, observed and pointed out by BHEL.

3.15.0 INSPECTION / QUALITY ASSURANCE / QUALITY CONTROL STATUTORY INSPECTION

3.15.1 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/IBR and other statutory provisions and as per BHEL Engineer's instructions.

3.15.2 Preparation of quality assurance log sheets and protocols with customer's Engineers, welding logs and other quality control and quality assurance documentation as per BHEL Engineer's Instructions, is within the scope of work / specification.

3.15.3 The protocols between contractor and customer/BHEL shall be made prior to installation for correctness of foundations, materials, procedures, at each stage of Installation, generally as per the requirement of Customer/BHEL. This is necessary to ensure elimination of errors or keeping them within tolerable limits and to avoid accumulation and multiplication of errors.

3.15.4 A Daily log Book should be maintained by every supervisor/Engineer of contractor on the job in Duplicate (One for BHEL and one for Contractor) for detailing and incorporating Alignment/clearance / centering / Levelling Readings and Inspection details.

3.15.5 All the Important Measurements shall be recorded in the Daily Log Book with sketches based on BHEL Drawings indicating Readings / Measurements actually Taken and Signed by BHEL/Customer / Contractor Representatives.

3.15.6 Approval Given by Customer/BHEL for welding, results tests etc. shall also be recorded in the log book.

3.15.7 Welding Details like number of joints, welder's Name, Date of welding, Details of Repair, Heat Treatment, Etc. will be documented in welding Logs as per BHEL Engineer's Instructions.

3.15.8 Heat Treatment details of HP Welds indicating minimum Temperature Recorded, Heating Rate, Cooling Rate, soaking Time, Etc., shall also be Recorded and documented by contractor as per BHEL Engineer's Instructions. High pressure Welder's performance Record shall be furnished every month. The performance Report of Welders shall indicate the percentage of Repair for each welder.

3.15.9 All the Electrical/Technical Measuring and Testing Instruments/Gauges, Feeler Gauges, Height Gauges, Dial Gauges, Micrometers, Levels, Spirit Levels, Surface plates, straight Edges, vernier calipers and all measuring instruments shall be provided by the contractor for checking, leveling, Alignment, Centering etc of Erected Equipments at various stages. The Instruments/gauges/Tools etc. provided should be of Brand, Quality and Accuracy, Specified by BHEL Engineer and should have necessary calibration and other certificates as per the Requirements of BHEL Engineer.

3.15.10 Total Quality is the Watch Ward of the work and standards, Procedures laid down by BHEL. We shall follow all the Instructions as per BHEL Drawings and Quality / Standards. Contractor shall provide for the services of quality Assurance Engineer.

3.15.11 The Welders performance will be reviewed from time to time as per the BHEL / IBR Standards and any welders not performing to the Standards set by BHEL / IBR Standards will be removed from working, contractor shall arrange for the alternate welders immediately.

3.15.12 All the welders including the HP welders shall carry identity cards as per the proforma prescribed by BHEL only Welders Duly authorized by BHEL / Boiler Inspector / Consultant shall be engaged on the work.

3.15.13 Contractor shall ensure speedy alignment and welding of all Enquipment erected by him after placement. Also all alignments, Welding, NDT Tests required for stage Inspection shall be completed as per Quality Assurance Procedures. All the Quality Assurance procedures have to be complied with before effecting column erection, Ceiling Beams erection, drum lifting, further structural work, Hydraulic Test, Trial Run of Equipment, Pre-commissioning and Post commissioning and any other tests required to be conducted for completing erection and commissioning.

3.16.0 STAGE INSPECTION BY FES / QA ENGINEERS

3.16.1 Apart from Day-to-Day Inspection by BHEL Engineers Stationed at site and also by Customer's Engineers, Stage Inspection of Equipment 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 Unit/ Factory Quality Assurance and commissioning Engineers. Contractor shall arrange all labour, Tools and Tackles, etc. for such stage inspections free of cost.

3.16.2 Any modifications suggested by FES and QA Engineers Team shall be carried out. Claims of Contractor, if any shall be dealt as applicable.

3.16.3 Any minor rectifications of minor repairs of defective work found out during stage Inspection shall be rectified free of cost, by the contractor.

3.16.4 Any major Rectification or Major Repair / Major Rework of Defective work found out during stage Inspection verification / checking, But not attributable to contractor shall also be carried out. Claims of contractor if any, shall be dealt as applicable.

3.17.0 STATUTORY INSPECTION

3.17.1 The scope includes Getting the Approvals from the statutory authorities (Like Boiler Inspector and labour officers). This includes arranging for inspection visits of Boiler Inspector periodically as per BHEL Engineer's instructions, submitting documents, radiograph, etc. and following up the matter with them.

3.17.2 All fees connected with the contractors for testing his welders / men / workers and testing, inspection calibrating of his instruments and equipments, shall be paid by the contractor. It shall be the contractor's responsibility to obtain approval of statutory authorities, wherever applicable, for the conducting of any work which comes under the purview of these authorities. Any cost arising from this shall be the contractor's account. However, BHEL shall pay all other fee for visits inspection of IBR and registration fees. In case these inspection have to be repeated due to delault / fault of the contractor and fees have to be paid again, the contractor shall have to bear the charges. These would be deducted from his bills.

3.18.0 PROGRESS OF WORK

During the course of erection, if the progress is found unsatisfactory, or if the target dates fixed form time to time for every milestone are to be advanced, or in the opinion of BHEL, if it is found that the skilled workmen like fitters, operators, technicians employed are not sufficient BHEL will induct required additional workmen to improve the progress and recover all charge incurred on this account including all expenses together with BHEL overheads from contractor's bills.

The contractor shall submit daily, weekly and monthly progress reports, manpower reports, materials reports, consumables report and other reports considered necessary by the Engineer.

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

The progress reports shall indicate that progress achieved against planned with reasons indicating delays if any, shall also furnish in detail the reasons for the same and shall give remedial action which the contractor intends to make good the slippage or lost time, so that further works can proceed as per the original programme and the slippage do not accumulate and affect the overall programme, in a format designed and approved by BHEL site Engineer.

The contractor shall arrange for weekly progress review meetings with the “Engineer” at site during which actual progress during the week vis-à-vis schedule programme shall be discussed for action to be taken for achieving targets. The programme for subsequent week shall also be presented by the contractor for discussions. The contractor shall constantly update / revise his work programme to meet the overall requirement and suit the material availability.

The contractor shall arrange for submitting 3 set of progress photographs every month to BHEL office, the areas to be photographed will be as per the instructions of BHEL Engineer. The quoted rate shall include this contingency.

The contractor must obtain the signature and permission of the security personnel of the customer for bringing any of their materials inside the site premises. Without the Entry Gate Pass these materials will not be allowed to be taken outside.

HSE SPECIFIC REQUIREMENT
OCCUPATIONAL HEALTH & SAFETY MANAGEMENT SYSTEM

SUB CONTRACTOR TO ENSURE COMPLAINCE OF THE FOLLOWING **HEALTH** RELATED POINTS

01. Sub-contractor to identify nearest hospital for Health check up of his staff and workers and intimate BHEL site office & PSSR HQ.

02. To arrange for occupational health check up / screening of contractor's staff and workers engaged in sub contracting activities. In this, category of workmen such as welders, gas cutters, grinders, radiographers, crane operators are to be given exclusive attention in respect of health screening.

03. Sub-contractor to arrange an ambulance vehicle or emergency vehicle on a continuous basis to meet any emergency situation arising at site work in which his staff and workers are engaged.

04. To provide appropriate facilities for prompt first aid treatment of injuries and illness at work. One first Aider for each sub contractor to be provided. First Aider should undergo training on first aid.

05. To provide filtered drinking water at selected place in a clean container.

SUB CONTRACTOR TO ENSURE COMPLAINCE OF THE FOLLOWING **SAFETY** RELATED POINTS

01. Personnel protective equipment (PPES): Required number of following PPES (Confirming to Relevant is Standards) to be made available to workmen at site and ensured that they are used .
    - Helmet
    - Safety goggles
    - Welding face shields
    - Safety belts for working at heights
    - Safety shoes
    - Ear plugs
    - Rubber gloves and mats for low tension (I.T) electrical works
    - Gum boots & aprons
    - Other items as required by BHEL site

02. Sub contractor to liase with nearest fire station and inform contact telephone number and contact person to meet any emergency.

03. To provide appropriate fire fighting equipment at designated work place and to provide fire fighting training to selected persons in his group of workmen to meet emergencies.

04. To provide adequate number of 24 V power supply points to work in a constrained and enclosed space.

05 . All power tapping points / switch boards /power & control cabling should fulfill required electrical safety aspects as per relevant is standard.

06 ELCBs (Earth leak circuit breakers) at all electrical distribution points to be provided.

07. Red and white caution tape of proper width (1.5 to 2 inch) to be used for cordoning unsafe area such as open trench, excavated area, etc.

08. To provide sub-contractors company logo or clothing to all staff and workers for identification including identity cards with photographs approved by BHEL.

09. High pressure and structural welders to be identified with colour clothing and to display copy of welders certificate with photographs of welder at the work place. They also should be in possession of valid welding procedure.

10. To display safe handling procedure for all chemicals such as lube oil, grease, sealing compound, kerosene, diesel etc. At stores & respective work place.

11. Contractor should authorize a person at site to stop work if there is a unsafe work noticed as per his knowledge.

12. Fitness for use of erected scaffolding to be certified by the contractors approved scaffolder and the certificate should be displayed on the scaffolding itself. If the scaffolding is unsafe , the same will not be used. the certificate to be updated daily. The scaffolding to be made as per the relevant is standard.

13. For making platform on the scaffolding , proper thickness and size of the plank of required quality wood to be used. The safe working load of the platform to be displayed on the scaffolding itself. Proper use of platform to be explained to the user.

14. All plant equipment should have inspection report before put in to use.

15. All T&Ps should be of reputed brand and having quality certificates..

16. All IMTE's should have valid calibration certificate from recommended institution / testing lab and these should be in place.

17. All lifting tackle and plant equipment should have safe working load certificate.

18. The right worker should be deployed for right job and the resume of site incharge, supervisors, and key workers to be submitted before commencement of work..

19. Sub-contractor should submit inspection / testing matrix of all T&Ps and to be approved by BHEL.

20. Sub-contractor to display safety slogan, safety board, caution boards wherever required in consultation with BHEL.

21. Sub-contractor to provide gas detectors of reputed make at desired locations.

22. Sub-contractor to conduct emergency mock drills, one drill per 6 months and submit report to BHEL.

23. Safe handling and storing of all equipment with adequate space to be ensured.

24. Sub contractor to deploy safety supervisor till the completion of the project.

25. Sub contractor to comply the safety reporting procedure of BHEL as practiced at present and also additional requirements that may arise out of future improvements in the safety management system. This includes computation of safety indices such as frequency rate, severity rate & incident rate.

26. Sub contractor to identify probable emergency situations such as electric shocks to workmen , caving in of shored earth , fall from height, collapse of scaffolding fire etc., and should have clear action plan to overcome them. Sub contractor to take required guidance from BHEL in this regard.

27. Sub contractor to identify hazardous activities which he may carryout and should train his workmen in those activities with the relevant operation control procedures. Sub contractor to take required guidance from BHEL in this regard.

28. Safe work permit system to be followed while working in confined space / near electric systems.

SUB CONTRACTOR TO ENSURE COMPLAINCE OF THE FOLLOWING **ENVIRONMENT** RELATED POINTS

1. HOUSE KEEPING : Sub contractor to carry out daily house keeping of work areas / stores through a check list prepared in consultation with BHEL.

2. Sub contractor shall adopt pollution prevention / reduce /control approach in all his site activities. this shall include:

    a. Transporting of oil / chemicals from stores to site safely without causing spillage. in case of any spillage, the area shall be cleaned and the remanant spilled oil disposed off to a safe place, identified for such disposal.

    b. To use required containers / cans / safety gadgets /appliances for transporting and for usage of oil / chemicals at site.

3. Sub contractor shall arrange for segregation / collection of scraps and dispose off to the identified place meant for scrap collection.

4. Sub contractor to adopt good erection practices / procedures with the objective of reduction of waste generation / rework

OTHER HSE REQUIREMENTS TO BE COMPLIED BY SUB CONTRACTOR

1. Sub contractor to clearly understand and accept the HSE policy of PSSR with a commitment to comply the requirements of the policy.

2. Sub contractors to arrange for daily meeting of their supervisors and work force before they disperse for their daily planned activities where in the relevant health , safety and environment aspects of the job and use of PPES are explained

3. Sub contractor to conduct monthly HSE meeting (internal) and submit the report to BHEL.

4. HSE slogans to be displayed in a proper board – hoarding at designated places in consultation with BHEL.

5. Sub contractor to submit a structured programme for training & occupational Health Screening of their work force at site after the Award of LOI.

SECTION – VI

SPECIAL CONDITION

6.1 SCOPE OF WORK

6.1.1 The work to be carried out at quoted/accepted rates by the contractor under the scope of these specifications covers the complete work of Handling and Transportation to site of work, preservation, inspection, preparation of foundation, erection, leveling, centering, assembly, alignment, grouting & final alignment of Pulverized coal fired boiler of 330 TPH capacity with all its auxiliaries and accessories, ESP and its auxiliaries, Mills , Rotating equipments, support & supporting structures including minor civil and structural works for RINL Visakhapatnam AP. The work to be carried out at quoted/accepted rates by the contractor under the scope of these specifications covers the complete work of handling, loading and transporting of materials from site store sheds/ storage yards to site of erection or pre-assembly yard and unloading at pre-assembly area/erection site, checking, cleaning, chipping and leveling & centering of foundations providing packers and shims/pre-assembling of equipments at the pre-assembly yard, inspection, minor rectification, preservation, erection, alignment, welding, grinding, radiography, LPI/MPI/UPL testing wherever needed, heat treatment, carrying out air tightness test by soap solution/kerosene, hydraulic test, passivation, steam blowing and safety valve floating including interconnection at the termination points, erection and dismantling of all temporary piping, valves, commissioning tests and trial runs of the equipments and supply and application of final painting covered under tender specifications and providing adequate assistance during entire commissioning and unit trial operations and final painting of Boiler & its auxiliaries, ESP and its auxiliaries, Rotating machineries, Mills, etc of 330TPH capacity Boiler. The work shall conform to dimensions and tolerances given in various drawings and quality manuals provided by BHEL. If any portion of work if found to be defective in workmanship not conforming to drawings or other stipulations, the contractor shall dismantle and redo the work duly replacing the defective materials at his cost, failing which the job will be carried out by BHEL by engaging other agencies/departmentally and recoveries will be effected from contractor's bill towards expenditures incurred including BHEL's overhead charges.

6.1.1 Field Quality Assurance formats

It is the responsibility of the contractor to collect and fill up the relevant FQA log sheets of BHEL and present the same to BHEL after carrying out the necessary checks as per the log sheets and obtaining the signature of BHEL and customer in token of their acceptance. Payment to the contractor will be linked with the submission of these FQA log sheets.

6.2 FOUNDATION DRESSING

6.2.1 It shall be contractor's responsibility to check the various equipment foundations for their correctness with respect to level, orientation, dimensions etc., and ascertained dimensions shall be measured and submitted to BHEL for approval before erection. Also minor chipping, dressing of foundations up to 30 mm for obtaining proper face for packer plates / shims, as may be required for the erection of the equipment / plants will have to be carried out by the contractor without extra cost.

6.2.2 The surface of foundations shall be dressed to bring the surface of the foundations to the required level and smoothness prior to placement of equipment/equipments based on the foundations.

6.2.3 The concrete foundation, surfaces shall be properly prepared by chipping, grinding as required to bring the top of such foundation to the required level to provide the necessary roughness for bondage and to ensure enough bearing strength. All laitance and surface film shall be removed and cleaned and the packers placed with suitable mortar prior to erection of the equipment. The contractor shall ensure perfect matching of the packer plates with foundations by dressing the foundation and between the packer plates and base plates of structural columns to the satisfaction of BHEL Engineer.

6.2.4 All equipment bases and structural steel bases and foundations pockets shall be grouted and finished as per these specifications after surface preparation unless otherwise recommended by the equipment manufacturers. The surface preparation includes soda washing of the foundations to remove oil, grease etc. to ensure proper grouting. The contractor at his cost shall arrange the required materials like

sand, gravel, cement etc and cleaning consumables. Special cement like conbextra, shrink-comp or its equivalent etc. required for grouting ,as specified by BHEL engineer will be arranged by the contractor at his cost.

6.2.5 Total grouting of the columns / equipments including pocket grouting, grouting at the gap between foundation and base plates top surface of column / equipments is in the scope of the contractor. All the grouting shall be carried out by non-shrink cement like conbextra GPI/Conbextra GP II or its equivalent etc. The contractor at his cost shall arrange this special non-shrink cement. The quoted rate shall inclusive of the same.

6.2.6 PROCEDURE FOR GROUTING

Contractor has to carryout the grouting as per the work instructions for grouting available at site.

6.2.6.1 All the materials required for grouting including special cements like conbextra GPI, ACC Shrinkkomp-N20 or its equivalent as approved by BHEL, and other materials like Portland cement, sand, etc., are to be arranged by the contractor at his cost.

6.3 ERECTION SCOPE FOR BOILER & ESP

The scope of the work will comprise of but not limited to the following

6.3.1 Loading at storage yard after identification, transporting to site or pre-assembly yard / erection site, unloading at pre-assembly yard / erection site pre-assembling of equipments wherever required for inspection or checking, erecting the material aligning, welding, fastening, supporting, grouting, carrying out the necessary non-destructive testing as may be required, carrying out statutory tests arranged, providing services for trial operation, pre-commissioning activities up to the time of completion of commissioning activities and supply and application of final painting. The contractor should erect and assemble the components as per the drawings issued and the no of components supplied to him will be on the basis of shipping list / completion schedules. Complete pre assembling of components are in the scope of the contractor.

6.3.2 Any fixtures, concrete block supports, steel structures required for temporary supporting for pre-assembly or checking and welding for lifting and handling during pre-assembly and erection shall be arranged by the contractor.

6.3.3 Details regarding boiler components, sub-assemblies, ESP and auxiliaries etc. to be erected, tested and commissioned under the scope of this tender are given in this tender. The schedule of weights given in the appendices are only approximate and meant for giving a general idea to the tenderer, about the magnitude of the work involved. This should not be taken for billing or any other claims. All weights for such purposes will have to be taken from design documents only (Shipping list).

6.3.4 All the works such as cleaning, checking, leveling blue matching, aligning, assembling, temporary / erection for alignment, opening, dismantling of certain equipments for checking and cleaning, surface preparation, edge preparation, fabrication of tubes and pipes as per general engineering practices at site, cutting, grinding, straightening, chamfering, filing, chipping, drilling, reaming, scrapping, shaping, fitting-up bolting, welding etc, as may be applicable in such operation and are necessary to complete the work satisfactorily are to be treated as incidental and the same shall be carried by the contractor as part of the work with in the quoted rates.

6.3.5 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. All fittings like ‘T’ pieces, weld neck flanges, reducers etc. shall be suitably matched with pipes for welding. The valves will have to be checked, cleaned or overhauled in full or in part before erection, after chemical cleaning and during commissioning. Edge preparation becomes the part of erection work. However, payment for new edge preparation reconditioning beyond reasonable limits will be considered as per man day rates.

6.3.6 Adjustments like removal of ovalities in pipes and opening or closing the fabricated bends of high pressure piping to suit the layout shall be considered part of work and the contractor is required to carryout such work free of cost, as per instructions of BHEL, which shall include specific heat treatment procedures etc. Quality correction beyond reasonable limits will be paid us per man day rates.

6.3.7 Certain adjustments in length of steel members may be necessary while erecting high pressure pipelines of boiler and piping (pre fabricated lines) and the contractor should remove the extra lengths / and extra lengths to suit the final layout after preparing edges afresh and adopting specified heat treatment procedures at no extra cost, wherever indicated. Such adjustments in length for pipes of thickness more than 16 mm will be paid as per man day rates.

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

6.3.9 Ducts / expansion pieces are dispatched to site in loose walls / plates and these are to be assembled at site before erection. All field connection duct / expansion pieces and dampers shall be seal welded on inside as well as outside.

6.3.10 Fabricated pipes are sent in standard length and will be cut to suit the site conditions and the layouts. Tubes or pipes wherever deemed to be convenient will be sent in running lengths with sufficient bends. Bends up to NB 65mm will have to be fabricated at site adopting specified heat treatment procedures, wherever required at no extra cost.

6.3.11 All welded joints should be painted with anti-corrosive paint, once radiography and stress relieving works are over. Daily welding reports in the proforma suggested by BHEL should be submitted by next morning without fail.

6.3.12 All the dampers, valves, lifting equipments, power cylinders, etc. shall be serviced and lubricated to the satisfaction of BHEL Engineer before erecting the same and also during pre-commissioning. The bearings of dampers shall be properly cleaned, serviced and lubricated before commissioning at no extra cost Even after commissioning in the equipments, if there are problems in the operation they have be attended to by the contractor during the tenure of the contract.

6.3.13 In case of any class of work for which there is no such specification as laid down in the contract such as blue matching, welding of stainless steel parts etc. the work shall be carried out in accordance with the instructions and requirements of the BHEL Engineer at the quoted rates only.

6.3.14 In the case of structural members / ducts, in certain cases, the raw material will be supplied in random lengths and the contractor will have to make up the length / prepare the edges to suit the matching profiles, weld / bolt connect the joints at no extra cost. Normally, the machine profile will be cut out for the structural members but the contractor will have to carry out suitable alteration / adjustments at site, without any extra payment, in case it becomes necessary. Also it may sometimes be necessary to remove some of the erected members to facilitate erection of bigger, pre assembled equipments. In such case, the removal and re erection of such members which are essential and if so agreed by BHEL Engineer, will have to be done by the contractor without any extra payment.

6.3.15 Attachment, welding of necessary instrumentation tapping points, thermocouple pads, root valves, condensing vessels, flow nozzles and control valves etc. both for regular measurements and performance testing to be provided on boiler / ESP its auxiliaries or pipelines covered within scope of this tender, will also be the responsibility of the contractor and the same will be done as per the instructions of BHEL Engineer. The erection and welding of all above items will be contractor's responsibility, even if:

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

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

6.3.16 Spring suspensions / constant load hangers have to be preassembled and adjusted for the required loading and erected as per the instructions, of BHEL Engineer. Any adjustments, removal of temporary arrestors / lockers, etc. have to be carried out as and when required.

6.3.17 The contractor shall take all reasonable care to protect the materials and equipment during erection. Touch up painting required to be done on any equipment or part during the course of erection will have to be done by the contractor.

Contractor shall carry out necessary preservative painting, periodic application of preservatives on pressure parts and other equipments during erection / after erection until completion of work. Necessary preservatives / paints, thinner only will be provided by BHEL free of cost.

Contractor shall provide necessary crew with all items like wire brushes, paint brushes, emery paper, cotton waste, scaffolding materials etc at his cost.

6.3.18 The contractor shall fabricate piping, install lub oil systems and carry out the acid cleaning of fabricated piping. The contractor shall also service the lub oil system, carry out the hydraulic test of oil coolers, etc.

6.3.19 All tubes and pipes shall be cleaned and blown with compressed air and shown to the Engineer before lifting. Sponge ball test shall be carried out for all tubes before erecting the same. Bigger size pipes should be cleaned with flexible wire brush, wherever necessary. After cleaning is over, the end caps shall be put back in tube openings till such time they are welded to other tubes.

6.3.20 All attachment welding including those for insulation and refractory work coming on the pressure parts shall have to be done by the contractor. The hooks are suitable for stud welding machines. Contractor’s quoted rate shall include all these contingencies. Attachment welding on pressure parts shall be done by qualified and certified welders only.

6.3.21 It is the responsibility of the contractor to do the alignment, checking, etc., if necessary, repeatedly to satisfy BHEL Engineer / customer Engineers with all the necessary tools and tackles manpower, etc., without any extra cost. The alignment will be complete only when jointly certified so, by the BHEL Engineer & customer. Also the contractor should ensure that the alignment is not disturbed afterwards.

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

6.3.22 Fine fittings, boiler trim piping, oil system and other small bore piping have to be routed according to site conditions and hence shall be done only in position. As such, layout of small bore piping in boiler and oil system shall be done as per the site requirement. Necessary sketch for routing these lines should be got approved from BHEL by the contractor. There is a possibility of slight change in routing the above pipelines when after completion, to suit the site conditions. The contractor should absorb this cost in his quoted rate.

6.3.23 Additional platforms for approaching different equipments as per the site requirement, which may not be indicated in drawings, shall be assembled and erected by contractor. However, the contractor shall be paid for this work on accepted tonnage rate for erection including any fabrication involved for the above works. The steel materials required for these works shall be supplied by BHEL free of cost and the contractor will have to install them to suit the requirement. Works of major nature not covered under this clause.

6.3.24 Complete penetration of water wall (Panel to panel) tube to tube and fins welding shall be achieved either by single side or double side welding. The decision of BHEL Engineer is final.

6.3.25 Work such as minor rectification of foundation bolts, reaming of holes, drilling of dowels, matching of bolts and nuts, making new dowel pin, etc. are covered in the scope of work.

6.3.26 Certain extra lengths of various tubes/pipes and fabricated ducts are provided as erection allowance and the same have to be cut/adjusted to suit the site conditions and layouts or certain small lengths may have to be added for adjustments to suit the site conditions. For any mismatch while matching the joints in tubes, the cutting, adjusting, re welding, addition spool pieces should be done by the contractor to match site conditions without any extra payment.

6.3.27 No temporary supports shall be welded on the pressure parts of piping. Welding of temporary supports, cleats, etc. on the boiler columns shall be avoided. In case of absolute necessity contractor shall take prior approval from BHEL Engineer. Further, any cutting or alternation of member of the structure of platform or other equipment shall not be done without specific prior approval of BHEL Engineer.

6.3.28 The column erection has to be done tier by tier with all bracings, beams to be erected, welded / bolted. Second tier of erection can be carried out only after grouting of column base.

6.3.29 Contractor shall engage separate gangs throughout the contract period, exclusively for proper house keeping of the site. The contractor has to make necessary arrangements for collection and for bringing down the scrap from, all locations and taking them away from the erection areas to various locations as indicated by BHEL Engineer. The house keeping must be a routine and continuous activity. If the contractor does not do this job satisfactorily, BHEL will arrange for the same at the cost of the contractor. Periodical payments to the contractor for the work done will be considered only if the house keeping is certified as satisfactory by the customer.

6.3.30 All hangers, supports and anchors (including concreting or welding) shall be installed as per drawing to obtain are reliable and complete pipe installation as per instructions of BHEL Engineer. Normally supports are issued in running meters. Any additional supports as called for by BHEL Engineer shall be fabricated by the contractor and provided at no extra cost. However, the raw material required for fabrication of such supports shall be supplied by BHEL free of cost. (No machining or threading is involved).

6.3.31 Some platform materials in PG 36 and 48 approach ladders, suspension materials etc. will be supplied in running meters. The contractor has to fabricate these materials wherever they are supplied in running meters and erect them within the quoted tonnage rates.

6.3.32 The materials for boiler burner roofing, side cladding etc. will be supplied by BHEL and contractor has to erect the same at the quoted / accepted tonnage rate.

6.3.33 It shall be the responsibility of the contractor to provide ladders on column for initial works till such time stairways are completed. For this the ladder should not be welded on the column and should be fabricated clamping type ladders. No temporary welding on any structural members is permitted except under special circumstances with the approval of BHEL. No members of the structure / platform should be cut without specific approval of BHEL.

6.3.34 Assistance for calibrating / testing the power cylinders / valves etc. and setting to actuators coming under various groups shall be provided by contractor within the quoted rates.

6.3.35 Hanger rods are shown in the pressure parts arrangement drawing for boiler. Any cutting / welding and required heat treatment and necessary NDT of such hanger rods will be done by the contractor. The hangers for pressure parts will be tested for even distribution of load with the help of torque wrench.

6.3.36 Skin casing sheet for covering the boiler roof panels, rear arch tubes and other areas will be supplied as fabricated items. Any cutting and re-fabrication to suit the site conditions shall be carried out within the quoted rates.

6.3.37 It is the responsibility of the contractor to engage his workmen in shifts or on overtime basis for achieving the desired progress and target set by BHEL. The contractor's quoted rate shall include all these contingencies.

6.3.38 The contractor is strictly prohibited in using any of the boiler / ESP components like angles, channels, hand-rails for any temporary supporting or scaffolding work. In case of such misuse, a sum as determined by BHEL shall be recovered from contractor's bills. Also the contractor will be responsible for the safe custody and proper accounting of all materials issued in connection with the work. If the contractor has drawn materials in excess of design requirements, recoveries will be effected for such excess drawals at the rate prescribed by manufacturing units.

6.3.39 For all the site routed piping under PG-21, 24 & 42 as built drawings are to be submitted by the contractor immediately after erection.

6.3.40 The contractor has to remove the scrap/debris periodically as and when required and returned to BHEL stores. In case the contractor fails to remove the scrap / debris, the same shall be done by BHEL at the cost of contractor. The temporary structures / item welded either to structures or pressure parts are to be cut and removed without any damage, the same shall have to be made good by the contractor.

6.3.41 Regarding steam coil-Air preheater the contractor is expected to erect as per the drawings. Hydraulic test of SCAPH has to be carried out on the ground before lifting it to the position.

6.3.42 Air leak test is to be conducted for the cold & hot secondary air ducts, primary air ducts. Also gas tightness test is to be done for the flue gas ducts. In addition to this, leak tests are to be done for the furnace, skin casing works carried out in the boiler roof, furnace bottom etc to the satisfaction of BHEL/Customer.

"EACH CEILING GIRDER WILL BE SUPPLIED IN PIECES AND CEILING GIRDERS ARE TO BE PRE-ASSEMBLED AT SITE AND WELDING & NDT TESTS ARE TO BE CARRIED OUT, INCLUDING 100% RADIOGRAPHY / NDT FOR THE WELDED JOINTS IN CEILING GIRDERS.

6.3.43 In case any class of work for which there is no such specification as laid down in the contract such as welding of stainless steel parts etc. works shall be carried out in accordance with the instructions and requirements of the Engineer at the quoted rates only.

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

6.3.45 Suspension for pipes / ducting will be supplied in running lengths which shall be cut to size and adjusted as required. Ducts / expansion bellows are dispatched to site in loose wall plates and these are to be assembled and welded at site before erection. All joints connecting ducts, expansion pieces shall be seal welded on inside and as well as outside. Also it may sometime become necessary to remove any of the erected members to facilitate erection of bigger / pre-assembled equipment. In such case the removal and re-erection of such member, which are essential will have to be carried out by the contractor without any extra payment.

6.3.46 It is the responsibility of the contractor to provide electricians round the clock during pre-commissioning, commissioning and post-commissioning activities. Further removal and reconnection of power for HT and LT motors are to be carried out as part of commissioning activities. Contractor's quoted rate shall include all these contingencies.

6.3.47 All the bearings, gear boxes, etc. of the equipments and electrical motors to be erected are provided with protective greases only. Contractor shall arrange as and when required by the Engineer for cleaning the bearing, gears etc. with kerosene or some other agent, if necessary by dismantling some of the parts of the equipment during erection and shall arrange for re-greasing. Lubricating them with the recommended lubricants and for assembling back the dismantled parts. Lubricants will however be supplied free of cost by BHEL.

6.3.48 The monthly programme of erection and targets shall be worked out prior to start of erection in consultation with BHEL Site Management. It is the responsibility of the contractor to engage their workmen in shifts or on overtime for achieving the desired progress / targets set.

6.3.49 Loading of Emitting / electrodes should be done only just before commissioning of boiler. The contractor has to carry out this work after getting clearance from BHEL engineer whose decision shall be final and binding in this regard.

6.3.50 All the dampers valves lifting equipments, etc., shall be serviced and lubricated to the satisfaction of BHEL Engineer before erecting the same and also during pre-commissioning. The bearings of dampers shall be properly cleaned, serviced and lubricated before commissioning at no extra cost. Even after commissioning the equipments, if there are problems in the operation, they have to be attended by the contractor during the tenure of the contract. Welding or joining of extension spindle for valves to suit the site conditions and operational facility shall be part of erection work within the quoted rate.

6.3.51 In the case of structural member / ducts, in certain cases, the raw material will be supplied in random lengths and the contractor will have to make up the length/prepare the edges to suit the matching profile weld / bolt connect the joints at no extra cost.

6.3.52 Normally, the matching profile will be cut out for the structural members but the contractor will have to carry out suitable alterations/adjustments at site without any extra payment, in case it becomes necessary.

6.3.53 Contractor shall carryout chipping and blue-matching of foundation concrete with the packer plates. The packer plates shall be supplied by BHEL. Necessary machining wherever required and blue-matching of packer plates shall be carried out by the contractor within the quoted rates.

6.3.54 EP collecting Electrodes may require straightening and repair due to minor transport damages before erection and spot heating in position to get correct alignment which shall be done by contractor free of cost.

6.3.55 ROOF INSULATION

6.3.56 One layer of insulation matters on roof top of ESP roof (inner) shall be applied before outer roof is placed. The scope shall also include the above work even though the materials are supplied under some other product groups and the erected materials shall be paid at the accepted tonnage rate of ESP.

6.4.0 DRUM LIFTING

6.4.1 All the required T & Ps and arrangements required for Drum lifting is in the contractor scope. The entire activity of drum lifting are to be carried out as per instructions of BHEL / Customer Engineers.

6.4.2 BHEL shall arrange to unload boiler drum in a convenient location. Transportation of the same to erection site for erection shall be within the scope of work of the contractor.

6.4.3 Drum lifting structures shall be fabricated by the contractor at site according of BHEL drawing. Necessary steel for the same shall be arranged by BHEL. Fabrication, erection and complete installation of drum lifting arrangements, including supply of consumables and anchoring for diversion pulleys shall be carried out by the contractor at no extra cost. After completion of drum lifting, erection and alignment, the drum lifting arrangements shall be dismantled by the contractor and returned to BHEL stores in good condition and to the satisfaction of BHEL Engineer.

6.4.4 HSFG bolts of boiler supporting structure are to be tightened, by turn of nut method / Torque Wrench, as per the instructions of BHEL Engineer. The bolted Joints should be jointly checked by the BHEL/customer and contractor's personnel for the required tightness and retightened wherever necessary. The tightened bolts should be identified by colour paints. Facility for random checking with calibrated torque wrenches shall also be provided by contractor.

6.5.0 WELDING, HEAT TREATMENT & RADIOGRAPHY

6.5.1 The pressure parts shall be erected in conformity with the provisions of Indian Boiler Regulations and as may be directed, as per other standard/specification in practice in BHEL. The other method of welding (viz) ARC, TIG or other methods as indicated in the detailed drawing or as instructed by BHEL Engineer shall be followed. BHEL Engineer will have the option to change the method to suit site conditions. All the prepared/patched edges will have to be suitably protected to prevent rusting or foreign material ingression.

6.5.2 Welding of high tensile structural steel and pressure parts shall be done by using certified welders who possess requisite certificate and who are approved by BHEL Engineer.

6.5.3 All Welders shall be tested and approved by BHEL Engineer before they are actually engaged on the work even though they may possess the requisite certificate. BHEL reserves the right to reject any welder without assigning any reason. The welder identification code as approved by the BHEL Engineer shall be stamped by the welder on each joint done by them. The contractor will be responsible for the periodic renewal, retesting of the welders as demanded by BHEL statutory requirements.

6.5.4. BHEL Engineer is entitled to stop any contractor's welders from his work if his work is unsatisfactory for any technical reasons or there is a high percentage of rejection of joints welded by him in the opinion of BHEL Engineer, will adversely affect the quality of welding. Even though the welders has earlier passed the tests it does not relieve the contractor from his contractual obligations, to check the performance of the welders.

6.5.5 All charges for testing of welders (pre production test) including destructive and non-destructive tests at site shall have to be borne by the contractor. Necessary pipe material and the welding material as provided in the document will be arranged by BHEL and all testing facility will be made available by the contractor.

6.5.6 All welded joints shall be subjected to acceptance by BHEL Engineer.

6.5.7 Pre-heating/post heating and stress relieving after welding are part of erection work and shall be performed by the contractor in accordance with the instructions of BHEL Engineer. Contractor shall arrange to supply heating equipment with automatic recording devices. Also the contractor shall have to arrange for the labour, all heating elements, thermocouples, compensating cables, insulation materials like mineral wool, asbestos cloth, ceramic beeds, asbestos rope, etc required for the heat treatment and stress relieving works. During the heat/stress relieving operations, the temperature shall be measured at one or more points as required by attaching thermocouples and recorded on a continuous printing type recorders. All the recorded graphs for the heat treatment works carried out shall be got signed by BHEL Engineer prior to the commencement of each cycle and handed over to BHEL on completion. The graphs will be the property of BHEL. The contractor has to provide (Thermo Chalks) temperature recorders, thermocouple attachment units, graph sheets, etc required for the job and maintain them in good condition.

6.5.8 All electrodes shall be baked and dried in an electric electrode drying oven to the required temperature and for the period specified by the Engineer before they are used in Erection work, and all welders including high pressure welders shall have a portable electrode drying oven at the work spot.

6.5.9 All butt joints of high pressure tubular system of boiler and piping shall be carried out by TIG root run and subsequent runs by Arc welding. Full TIG welding, wherever necessary shall be carried out within the quoted rates. For oil system piping root run of all the butt joints shall be carried out by TIG welding only.

6.5.10 The technical particulars, specifications and other general details of works shall be in accordance with BHEL welding, Heat treatment and NDE manuals or equivalent as decided by the BHEL Engineer.

6.5.11 Contractor shall carryout Radiography as per Welding Manual Booklet applicable as per IBR, enclosed. However, percentage radiography shown in the respective drawings shall be final and binding on the contractors.

The field joints in the ceiling girders are to be radio graphed and preheating and post weld heat treatment to be done as per BHEL procedures and manuals.

The percentage given above are tentative, which may be increased depending upon the quality of joints at the discretion of BHEL.

6.5.12 Low speed high contrast fine grain films (D7 or equivalent) in 10cm width only should be used for weld joint radiography. Film density shall be between 1.5 to 2.00.

6.5.13 All radiographs shall be free from mechanical, chemical or process marks to the extent they shall not confuse the radiographic image and noticed.

6.5.14 Penetrometer as per ASME/ISO, shall be used for all exposures.

6.5.15 Lead numbers and letters (generally or 6 mm size) are to be used for identification of radiographic contract No., joints identification, sources used welders identification, SFD used are to be noted down in the paper cover of radiography. Load identifying screens for front and back of the film shall be used as per the instruction of BHEL Engineer.

6.5.16 The weld joint is to be marked with permanent mark A, B, C to identify the segments. For this a low stress stamp shall be used to stamp the pipe on the down stream side of the weld. For the multiple exposures on pipes, an overlap of about 25mm of film shall be provided.

6.5.17 The contractor shall be fully equipped with radiography equipments, films, chemicals and other dark room facilities. There must be a number of radiographic personnel with sufficient experience and certified by BARC for field radiographic inspection. Further the contractor must follow strictly the safety rules laid down by the BARC, from time to time; contractor's radiographers shall also be registered with BARC for film badge service.

6.5.18 Contractor shall provide all skilled, unskilled workmen required for the job, which will include Engineers, supervisors, operators, as required for timely and satisfactory execution of radiography work.

6.5.19 If the contractor does not carry out radiography work in time due to non-availability of film, chemical etc. BHEL shall get the work done through some other agency at the risk and cost of the contractor.

6.5.20 All the radiographs shall be properly preserved in air-conditioned rooms and shall become the property of BHEL.

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

6.5.22 The defects as pointed out by the Engineer shall be rectified immediately to the satisfaction of the Engineer and Re- radio graphed. The decision of the Engineer regarding acceptance or otherwise of the joint shall be final and binding on the contractor.

6.5.23 Wherever radiographs are not accepted on account of poor exposure, joints shall be re-radio graphed and new film submitted for evaluation. Radiographs shall be taken again on joints after carrying out repairs. However, if the defect persists after the first repair as per radiograph, carrying out

radiography shall be repeated till the joint is made acceptable. In case the joint is not repairable the same shall be cut, re-welded and re-radio graphed at contractor's cost.

6.5.24 The contractor shall also be equipped for carrying out other NDT like liquid penetrant inspection, magnetic particle inspection etc., as and when required in the interest of work, within the quoted rates.

6.5.25 For carrying out ultrasonic testing of welded joints of large size tubes and pipes, it will be necessary to prepare the surface by grinding to a smooth finish and contour as described by BHEL Engineer. The contractor's scope of work include such preparation and no extra charges are payable for this.

6.5.26 The contractor has to make his own arrangements for air-conditioned dark room to process the radiographs.

6.5.27 It may also be necessary to adopt inter layer radiography / MPT / UT depending upon the site / technical requirements necessitating interruptions in continuity of the work and making necessary arrangements for carrying out the above work. The contractor shall take all this in to account and quote the price inclusive of all such work and radiography.

6.5.28 The welded surface irrespective of place of welding shall be cleaned of slag and painted at the center with primer paint to prevent corrosion at no extra cost towards this. Paint for this purpose shall be provided by BHEL.

SCOPE OF ERECTION FOR ROTATING EQUIPMENT

The scope of work will comprise of but not limited to the following

6.5.29 Loading at storage yard after identification, transporting to site or pre-assembly yard / erection site, unloading at pre-assembly yard / erection site, pre-assembling of equipments wherever required for inspection or checking, erecting the material, aligning, welding, fastening, supporting, grouting, carrying out the necessary non-destructive testing as may be required, carrying out statutory tests arranged, providing services for trial operation, pre-commissioning activities and supply and application of final painting.

6.5.30 The contractor should assemble and erect the components as per the drawings issued and No. of components supplied to him will be on the basis of shipping list / completion schedules. Complete pre-assembling of components like fans, mills, etc. is in the scope of contractor.

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

6.5.32 The scope of equipments to be erected under this contract is detailed in Tender Specification. The schedule of weights given wherein is approximate and is meant only to give a general idea to the Contractor about the magnitude of the work involved.

6.5.33 All the works such as cleaning, checking, leveling blue matching, aligning, assembling, temporary erection for alignment, opening, dismantling of certain equipments for checking and cleaning, surface preparation, edge preparation, fabrication of tubes and pipes as per general engineering practices at site, cutting, grinding, straightening, chamfering, chipping, and rectification of foundation upto 30 mm, drilling, reaming, scrapping, shaping, fitting up etc. as may be applicable in such erection works are to be treated as incidental to erection and necessary to complete the work satisfactorily and the same shall be carried by the contractor as part of the work and at his quoted rates.

6.5.34 It shall be the responsibility of the contractor to provide ladders on column for initial works till such time stairways are completed. For this the ladder should not be welded on the column and should be fabricated clamping type ladders. No temporary welding on any structural members is permitted except under special circumstances with the approval of BHEL.

6.5.35 No members of the structure / platform should be cut without specific approval of BHEL.

6.5.36 Fixing, welding of necessary instrumentation tapping points, to be provided on auxiliaries covered within the scope of this specification will also be the responsibility of the contractor and will be done as per the instructions of BHEL Engineer. The fixing / welding of all the above items will be contractor's responsibility even if the

I) Product groups under which these items are not specifically indicated in the Tender Specification.

II) Items are supplied by an agency other than BHEL

6.5.37 In case of any class of work for which there is no such specification as laid down in the contract such as welding of stainless steel parts, etc. works shall be carried out in accordance with the instructions and requirements of the Engineer at the quoted rates only.

6.5.38 All the dampers, valves, lifting equipments, etc. shall be serviced and lubricated to the satisfaction of BHEL Engineer before erecting the same and also during pre-commissioning. The bearings shall be properly cleaned, serviced and lubricated before commissioning at no extra cost. Even after commissioning the equipments, if there are problems in the operation they have be attended to by the contractor during the tenure of the contract. Welding or joining of extension spindle for valves to suit the site conditions and operational facility shall be part of erection work within the quoted rate.

6.5.39 In the case of structural members/ducts or piping , in certain cases, or in small bore piping for integral cooling water or lubrication system, etc the raw material will be supplied in random lengths and the contractor will have to make up the length/prepared the edges to suit the matching profile weld/bolt connect the joints at no extra cost.

6.5.40 Contractor shall carryout chipping and blue-matching of foundation concrete with the packer plates. the packer plates shall be supplied by BHEL. Necessary machining wherever required and blue–matching of packer plates shall be carried out by the contractor within the quoted rates.

6.5.41 The contractor shall take all reasonable care to protect the materials and equipment during erection. Preventive painting required to be done on any equipment or part during the course of erection will have to be done by the contractor at no extra cost.

6.5.42 Attachment welding of necessary instrumentation tapping points, both for regular measurements and performance testing also included within the scope of this tender and it is the responsibility of the contractor for carrying out the above works as per the instruction of BHEL Engineer, within the quoted rate.

6.5.43 Contractor has to arrange required fire proof tarpaulins to protect the machined components / assembled parts drawn from BHEL before and after erection at their cost.

6.5.44 Contractor shall provide necessary crew with all items like wire brushes, paint brushes, emery paper, cotton waste, scaffolding materials etc.

6.5.45 It is the responsibility of the contractor to do the alignment, checking, etc. if necessary, repeatedly to satisfy BHEL Engineer / Customer Engineers with all the necessary tools and tackles, manpower etc. without any extra cost. The alignment will be completed only when jointly certified so, by the BHEL Engineer & Customer. Also the contractor should ensure that the alignment is not disturbed afterwards.

6.5.46 Works such as minor rectification of foundation bolts, reaming of holes, drilling of dowels, matching of bolts and nuts, making new dowel pin etc. are covered in the scope of work.

6.5.47 Certain extra lengths of various tubes/pipes are provided as erection allowance and the same have to be cut/adjusted to suit the site conditions and layouts or certain small lengths may have to be added for adjustments to suit the site conditions. For any mismatch while matching the joints in tubes, the cutting adjusting re welding, addition spool pieces should be done by the contractor to match site conditions without any extra payment.

6.5.48 Contractor shall engage separate gangs throughout the contract period, exclusively for proper house keeping of the site. The contractor has to make necessary arrangements for collection and to bring down the scrap from various locations as indicated by BHEL Engineer. The housekeeping must be a routine and continuous activity in the various work fronts. If the contractor does not do this job satisfactory, BHEL will arrange for the same at the cost of the contractor. Periodical payments to the contractor for the work done will be considered only if the customer certifies the housekeeping as satisfactory.

6.5.49 It is the responsibility of the contractor to engage his workmen in shifts or on overtime basis for achieving the desired progress and target set by BHEL. The contractor's quoted rate shall include all these contingencies.

6.5.50 The contractor is strictly prohibited from using any of the components like angles, channels, hand-rails for any temporary supporting or scaffolding work. In case of such misuse, a sum as determined by BHEL shall be recovered from contractor's bills. Also the contractor will be responsible for the safe custody and proper accounting of all materials issued in connection with the work. If the contractor has drawn materials in excess of design requirements, recoveries will be effected for such excess drawls at the rate prescribed by manufacturing units.

6.5.51 Layout of small bore piping in lube oil system shall be done as per site requirement. Necessary sketch for routing these lines should be got approved from BHEL by contractor. There is a possibility of slight change in routing the above pipelines even after completion of erection, which is to be done without any extra cost.

6.5.52 Additional platforms of permanent nature for approaching different equipments, as per site requirement, which may not be indicated in drawings, shall be fabricated and installed by the contractor. However the contractor will be paid for this work on accepted tonnage rate for erection. The material required for platform will be supplied by BHEL free of cost.

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

6.5.54 The HT motor bearings shall be blue matched at site and checked for bearing clearance. Scrapping of bearing housing, if required to any extent shall be carried out by the contractor. No extra claim for blue matching of any two surfaces will be entertained. The HT motors will also be checked for air gap and adjustment stator / rotor to magnetic center shall be carried out as part of erection.

6.5.55 The fans shall be checked for blade clearance and other vital tolerances.The IGV units shall be serviced. Necessary assistance for balancing of equipment during trial run shall be provided by the contractor.

6.5.56 Vital clearance of mill should be checked at site and adjusted if required

6.5.57 All welded joints shall be subjected to acceptance by BHEL Engineer.

6.5.58 D.S.L. / equivalent system for hoisting equipments are also to be erected and commissioned including load testing by the contractor within the quoted rates. Required manpower including electricians are to be arranged by the contractor for carrying out commissioning of electrical hoist and load testing of the above electrical hoist. Required loads will be provided by BHEL free of cost.

6.5.59 The contractor has to remove the scrap/debris periodically as and when required and returned to BHEL stores. In case the contractor fails to remove the scrap/debris, the same shall be done by BHEL at the cost of contractor. The temporary structures/items welded to permanent members/pipes are to be cut and removed without any damage. Any damage so to be made good by the contractor at his cost.

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6.6.0 PROGRESS OF WORK

6.6.1 During the course of erection, if the progress is found unsatisfactory, or if the target dates fixed from time to time for every milestone are to be advanced, or in the opinion of BHEL, if it is found that the skilled workmen like fitters, operators, technicians employed are not sufficient BHEL will induct required additional workmen to improve the progress and recover all charge incurred on this account including all expenses together with BHEL overheads from contractor's bills.

6.6.2 The contractor shall submit daily, weekly and monthly progress reports, manpower reports, material reports, consumables report and other reports considered necessary by the Engineer.The manpower reports shall clearly indicate the manpower deployed category / wise daily, specifying also the activities in which they are engaged. The periodicity of the reports will be decided by BHEL Engineer at site.

6.6.3 The progress reports shall indicate that progress achieved against planned with reasons indicating delays if any, shall also furnish in details the reasons for the same and shall give remedial action which the contractor intends to make good the slippage or lost time, so that further works can proceed as per the original programme and the slippage do not accumulate and affect the overall programme, in a format designed and approved by the BHEL site Engineer.

6.6.4 The contractor shall arrange for weekly progress review meetings with the "Engineer" at site during which actual progress during the week vis-a-vis schedule programme will be discussed for action to be taken for achieving targets. The programme for subsequent week shall also be presented by the contractor for discussions. The contractor shall constantly update / revise his work programme to meet the overall requirement and suite the material availability.

6.6.5 The contractor must obtain the signature and permission of the security personnel of the customer for bringing any of their materials inside the site premises. Without the entry Gate Pass these materials will not be allowed to be taken outside.

6.6.6 The contractor shall maintain a record in the form as prescribed by BHEL for all operations carried out on each weld and maintain a record indicating the number of welds, the name of welders who welded the same, date and time of start and completion, preheat temperature, radiographic results, rejects if any, percentage of rejection, etc. and submit copies of the same to the BHEL Engineer as required.

6.7.0 TESTING, PRE-COMMISSIONING, COMMISSIONING & POST COMMISSIONING BOILER & ESP

6.7.1 The contractor shall carry out the required test on the boiler, pipelines and ESP such as gas tightness test for ducts by kerosene / soap solution test or any other method, hydraulic test of boiler, with his own consumables, labour, scaffolding and other items, if any.

Hydraulic test may be carried out in different stages, necessary blanks / valves will be supplied by BHEL free of charges. However the welding and removing it after hydrotest, repreparing the edges if required, it is to be done by the contractor within the quoted rates.

6.7.2 All the above tests shall be repeated till all the equipments satisfy the requirement / obligations of BHEL to their customer. As far as the hydraulic pressure test is concerned, the same shall be conducted to the satisfaction of BHEL and Boiler Inspectorate, if required at various. All the repairs arising out of the failures during testing shall be done by the contractor as part of the work.

6.7.3 The contractor has to provide manpower with requisite T & P and carry out the chemical cleaning, Alkali Boilout, Steam blowing etc. as per BHEL instructions. Contractor shall lay out all necessary temporary piping, install the pumps, valves, pressure gauges, cables, switches, cutting of some of existing valves, placing of rubber wedges in the valves, installation of temporary tanks for chemical storage and for mixing, temporary access platforms to mixing tanks etc., all arrangements for nitrogen capping etc. required for hydro-

test, chemical cleaning and steam blow off or for any other tests as the case may be. After the test is over all the temporary piping, pumps etc. will be removed. All these form part of the scope of work. All chemicals and alkalis shall be arranged by BHEL free of cost.

6.7.4 All temporary piping materials necessary for conducting hydraulic test, steam blowing etc. will be supplied by BHEL. However, servicing, erection and dismantling of the same is the responsibility of the contractor. Those items that are issued along with boiler components specified under despatchable unit for temporary piping including tanks, pumps, valves fittings, hangers and supports etc. supplied by BHEL or by other agencies alone will be paid at the quoted rates for erection. Charges for dismantling of temporary lines etc should be included in the quoted rates. The boiler drum internals shall be removed during chemical cleaning and will be refitted after completion of acid cleaning within the quoted rates.

6.7.5 The materials like acid circulation pumps with starters mixing tanks, valves piping etc. required for chemical cleaning are to be drawn by the contractor from BHEL / Customer stores. Payment will be made at the quoted rates for the weight assessed whenever, tonnage details are not available.

6.7.6 The pumps, pipes, tanks required for chemical cleaning shall be spared at BHEL stores on “as is where is basis” condition. All necessary repairs / overhauls alone are in he scope of the contractor at no extra cost. All the materials shall be returned to stores after use in good condition. Necessary spares will be given by BHEL.

6.7.7 All temporary pipe work and alterations carried out in the normal circulation system shall be tested, prior to commencement of chemical cleaning to a pressure of 1 ½ times the pressure at which cleaning / flushing processes will be carried out. On completion of chemical cleaning, an inspection shall be carried out in the presence of the Engineer to ascertain the effectiveness of the cleaning process. Satisfactory completion of acid cleaning is subject to the Engineer’s approval.

6.7.8 The valves, dampers, actuators etc. will have to be checked cleaned and overhauled in full or in part before erection, after acid cleaning, steam blowing and during commissioning as maybe necessary.

6.7.9 Commissioning of the boiler will involve trial runs of all the equipments, erected, lighting up of the boiler of the refractory, drying, blowing of the steam lines, floating of safety vales, flushing of all the lines by air, oil or steam as the case may be, trial run of the boiler, servicing of all equipments like dampers, actuators, valves etc. and any other works incidental to commissioning. Contractor shall provide required workers along with supervisors with all the requisite tools round the clock and material for all these works, which shall form part of the work to be done.

6.7.10 In case any defect is noticed during tests, trial runs such as loose components, undue noise or vibration, strain on connected equipment etc. the contractor shall immediately attend to these defects and take necessary corrective measures. If any adjustments and realignment are necessary the same shall be done as per the instructions of the Engineer. If any part of the equipment needs repair, rectification and replacement due to faulty erection or damage caused due to poor workmanship the same shall be done by the contractor at his cost and the parts to be replaced shall be provided by BHEL at the cost of the contractor.

6.7.11 During this period though the BHEL's/Clients staff will also be associated in the work, the contractor's responsibility will be to arrange required tools, man and plants till such time the commissioned units are taken over by BHEL's client.

6.7.12 After floating of safety valves, the commissioning activities will continue up to completion of trial operation. It shall be the responsibility of the contractor to provide various categories of workers in sufficient numbers as per the work requirement along with supervisors including necessary consumable tools etc., during this period. The rate quoted shall indicate all these contingencies also. The various categories of workers required for pre-commissioning, commissioning and post-commissioning activities are as follows:

a. Pipe fitters

b. Millwright Fitters

c. HP& structural welders

d. Riggers

e. Unskilled workers

f. Supervisors

g. Electricians

h. Any other category of workers as may be required.

6.7.13 It shall be specifically noted that the above employees of the contractor may have to work round the clock along with BHEL commissioning Engineers and hence, overtime, may be involved. The contractor‘s quoted rate shall be inclusive of all these factors also.

6.7.14 During commissioning, opening of valves, removal of certain gaskets, and re-erection in order to suit the commissioning requirement, changing of gaskets and attending to leakages, filling of oils to the meters/equipment, minor adjustments may arise. The quoted rate shall include the above work.

6.7.15 In case, any re-work is required because of contractor’s faulty erection which is noted during commissioning, the same has to be rectified by the contractor at his cost, if any equipment/part is required to be inspected during commissioning, the contractor will dismantle/open up the equipment/part and re-assembler/redo the work without any extra claim.

6.7.16 During commissioning any improvement or rectification due to design requirement is involved and if the contractor is asked to carry out the job, they shall be paid at man-day rates. For this purpose, daily labour report indicating therein nature of work carried out, consumables used, etc. shall be maintained by contractor, and got signed by BHEL Engineer every day. It is not obligatory on the part of BHEL to get the works done by the contractor. They can employ any other agency if they so desire at that time.

6.7.17 The ESP rectifier Transforrners are to be only erected by the contractor. Testing, Commissioning and oil filtering is not in the scope of this contract.

6.8.0 TESTING, PRE-COMMISSIONING, COMMISSIONING & POST COMMISSIONING OF ROTARY MACHINES

(All the works mentioned hereunder shall be carried out within the quoted and accepted rate)

6.8.1 The contractor shall carry out all the required tests on the equipments erected, using contractor's own consumables, labour and scaffoldings.

6.8.2 All tests should be repeated till all the equipments satisfy the requirement / obligation of BHEL to their customer. All the repairs (shop welded or site welded) arising out of the failures during testing shall be done by the contractor as part of the work. No separate payments will be made for these works.

6.8.3 It shall be the responsibility of the contractor to preserve the cleaned surfaces as per BHEL's requirement.

6.8.4 Commissioning of the equipments will involve, trial runs of all the equipments erected, blowing through the lines, flushing of all the lines by air, oil or steam as the case may be, trial run of the equipment and any other works incidental to commissioning. Contractor shall supply skilled technicians / workmen round the clock and materials for all equipment erected by them which shall form part of the scope of work.

6.8.5 In case any defect is noticed during test, trial runs, such as loose components, undue noise or vibration, strain on connected equipment, etc. THE CONTRACTOR SHALL IMMEDIATELY ATTEND TO THESE DEFECTS AND TAKE NECESSARY CORRECTIVE MEASURES. If any readjustment and realignment are necessary the same shall be done as per BHEL Engineer's instructions. If any part of the equipment needs repair, rectification and replacement, the same shall be done by the contractor at his cost. The parts to be replaced shall be provided by BHEL.

6.8.6 During this period, though the BHEL's / Client's staff will also be associated in the work, the contractor's responsibility will be to arrange for the complete requirement of men and required tools and plants till such time the commissioned units are taken over by the BHEL's Customer.

6.8.7 The commissioning activities will continue till completion of trial run of the units. It shall be the responsibility of the contractor to provide following category of workers in required numbers along with supervisors including necessary equipment, consumables, hand tools, etc. during this period. The rate quoted shall include all these contingencies also.

a. Millwright Fitters

b. Structural Welders

c. Riggers

d. Unskilled workers

e. Electricians

f. Any other category of workers as may be required.

6.8.8 It shall be specifically noted that the above employees of the contractor may have to work round the clock along with BHEL commissioning Engineers and hence overtime payment may be involved. The contractor's quoted rate shall be inclusive of all these factors also.

6.8.9 During commissioning, opening of valves, removal of certain gaskets and re-erection, realigning of rotating and other equipment, attending to leakage, filling of oil to the meters / equipment may arise. The quoted rate shall include the same.

6.8.10 If, during commissioning, any improvement of rectification due to design requirement is involved and if the contractor is asked to carryout the job, the same shall be paid at man day rates / man hour rate as indicated in this tender specification. For this purpose, daily labour report indicating there in nature of work carried out, consumables used, etc. shall be maintained by contractor and get signed by BHEL Engineer, every day. It is not obligatory on the part of BHEL to get the work done by the contractor. They can employ any other agency, if they so desired at that time.

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

6.8.12 It is the responsibility of the contractor to provide electricians round the clock during pre-commissioning and post-commissioning activities. Further removal and reconnection of power for HT and LT motors are to be carried out as part of commissioning activities. Contractor's quoted rate shall include all these contingencies.

6.8.13 All the bearings, gearboxes etc. of the equipments and electrical motors to be erected are provided with protective greases only. Contractor shall arrange as and when required by the Engineer for cleaning the bearings, gears etc. with kerosene or some other agent, if necessary by dismantling some of the parts of the equipment during erection and shall arrange for re-greasing / lubricating them with the recommended lubricants and for assembling back the dismantled parts. Required lubricants and cleaning agent 9kerosene etc) shall be arranged by the contractor at his cost. The quoted rate shall inclusive of the same.

6.8.14 The monthly programme of erection and targets shall be worked out prior to start of erection in consultation with BHEL Engineer. It is the responsibility of the contractor to engage their workmen in shifts or on overtime for achieving the desired progress / targets set.

6.8.15 All rotating machineries and equipment shall be cleaned, lubricated, checked for their smooth rotation, if necessary dismantling and refitting before erection by the contractor. If, in the opinion of the BHEL Engineer, the equipment is to be further checked at any stage of the work, necessary facilities for dismantling cleaning, lubricating & refitting shall be provided by the contractor at no extra cost.

6.8.16 The instructions of the motor manufacturer regarding storage of the motors and reconservation must be strictly followed without any deviation.

6.8.17 All the motors if necessary shall be stripped open thoroughly serviced with proper care and reassembled properly before erection by the contractor. During servicing, if any deficiency is observed, the same should be taken up with BHEL Engineer at site without any delay.

6.8.18 All the shafts of the rotating equipments shall have to be properly aligned to those of matching equipment to perfection, accuracy as required and the equipment shall be free from excessive vibrations so as to avoid overheating of bearings or other conditions, which may tend to shorten the life of the equipment. All bearings shafts and other rotating parts shall be thoroughly cleaned and lubricated as per the recommendations of BHEL Engineers before starting.

6.8.19 The contractor shall carry out the trial run of motors including checking the direction of rotation in the uncoupled conditions, checking, aligning and coupling the motor to the respective driven equipment. Before starting the motor, values of insulation (IR value) shall be recorded and if found unnecessary, dry out operation to be carried out by the contractor at no extra cost.

6.9.0 TIME SCHEDULE

6.9.1 The contractor shall have to mobilise in all respects within 7 (seven) days from the date of issue of Fax Letter of Intent to commence the work. BHEL Engineer will certify the actual date of start of work after adequate mobilization of manpower and T & P by the contractor

6.9.2 The entire work of erection testing and commissioning of Boiler, ESP and Rotating Equipment as detailed in the Tender specification shall be completed within **15 (Fifteen)** months from the date of start of work.

6.9.3 During the total period of contract the contractor has to carryout the activities in a phased manner as required by BHEL Engineer and as per the programme of events/targets fixed by BHEL/customer.

6.9.4 The work under this scope of contract is deemed to be completed in all respects only when all the components/ equipments are erected and trial run, testing and commissioning of all the equipments are completed including safety valves floating. The decision of BHEL in this respect shall be final and binding with contractor.

6.9.5 In case BHEL desires to advance the commissioning activities contractor has to complete all the works within the quoted / accepted rate, to suit the advanced commissioning

6.9.6 During the tenure of contract, if BHEL is not satisfied with the progress of BHEL have the right to with draw any portion of work / balance work and get the same done either directly employing their own personnel or through other agency at the risk and cost of the contractor. The contractor shall not be entitled for any compensation whatsoever in this regard.

6.10.0 PAYMENTS FOR WORK COMPLETED

6.10.1 The Contractor shall submit his on account monthly bill, at the end of each month, with all the details required by BHEL covering progress of work in all respects, from 25th of previous calendar month to 24th of the current month.

6.10.2 BHEL Engineer shall take measurement and certify regarding the actual work executed in the measurement books and bills for erection work.

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

6.10.4 PAYMENT TERMS

6.10.4.0 86% of the value shall be paid, prorate, as detailed below:

6.10.4.1 **I)Pressure Parts PG 04,05,06,07,08,10,11,12,18,19,21,24,28,31,80,81& 97(P)**

a. 20% on completion of pre assembly .

b. 30% on Completion of Erection and alignment and bolting.

c. 20% on Completion of welding .

d. 5% on completion of Radiography and NDE

e. 5% on completion of stress relieving

f. 6% on supports, fin welding and other attachment welding in all respect, and on completion of back pass alignment.

6.10.4.2 **II)STRUCTURES : - Under PG 35,36,38 & 39,**

a. 15% on completion of pre assembly wherever pre assembly is involved.

b. 18% on completion of Erection , alignment and bolting

OR

ab) 33% on completion of Erection , alignment and bolting wherever pre assembly is not involved

c. 43% on completion of alignment and welding.

d. 10% on completion of radiography and stress relieving wherever applicable.

6.10.4.3 III) Non Pressure Parts :-
PG09,20,41,42,43,45,47,48,50,52,57,99

a. 35% on completion of pre-assembly

b. 36% on completion of erection and alignment and completion welding .

c. 10% on completion of supports in all respects in the respective zones as per approved drawings.

d. 5 % on gas tightness test/kerosene test/lpi test etc.,

6.10.4.4 IV) ELECTROSTATIC PRECIPITATORS
PG 78 & 89, ESP TRANSFORMER

a) 20% on completion of pre assembly wherever involved
b) 15% on completion of erection and alignment for the items wherever pre assembly is involved

OR

ab) 35% on completion of erection and alignment for the items wherever pre assembly is not involved
c) 28% on completion of fastening ,welding , grouting along with supports
d) 5% on completion of Hopper upper part, middle and lower parts inspection doors heating elements poking doors etc.,
e) 8% on completion of inner roof , outer roof, insulator, housing, rectifier transformer pent house and their connected works in the roof like mono rails and hoists
f) 10% erection of collecting and emitting electrodes on completion of Gas distribution path and completion of raping mechanisam with the drives in all respects if any other PGMA is integral part of the above system, these are to be done by the contractor with out any additional cost.

6.10.4.5 V ROATING EQUIPMENTS
For PG 55,56,65,67, MILLS, MOTORS

i) 15% on completion of checking of foundation, chipping and placement of packers.

ii) 30% on completion of placement of equipments on the foundations.

iii) 33% on completion of alignment, welding & grouting.

iv) 5% on readiness of the equipments for the trial run.

v) 3% on Trial run of fans / units

6.10.4.6

Milestone payment

Further 7% payment on pro-rata basis common to all PG shall be released on achievement of the following milestone events for the tonnage erected.

A)) For Boiler Package

Sl No	Milestone	% of payment
1	On completion of Hydraulic Test	1 %
2	On completion of Boiler light up & Alkali Boill Out	1%
3	Coal firing	2%
4	Completion of final painting	3%

B) ESP package

Sl No	Milestone	% of payment
1	Completion of air and gas tightness test	1%
2	Completion of final painting	2%
3	Charging of all the ESP fields	1%
4	Completion of gas distribution test	1%
5	Coal firing	2%

C) ROTATING EQUIPMENTS

Sl No	Milestone	% of payment
1	On completion of clean air flow test of all mills	2%
2	On completion of commissioning of electrical hoist including load test of the hoists	2%
3	On completion of coal firing	1%
4	On completion of final painting	2%

6.10.4.7 1% of the total executed value will be paid on completion of area cleaning, cutting / removal and return of scrap.

1% of the total executed value will be paid on reconciliation of stores material and T&P issue and submission of final bill with all clearances.

6.11.0 The balance amount of 5% of the contract value (Boiler+ESP + Rotating machines) arrived at by actual quantity erected multiplied by unit rate accepted shall be paid after the guarantee period of **12 months**. The guarantee period will commence from the date of handing over of unit or six months from the date of completion of Coal firing whichever is earlier, provided all erection, testing and commissioning works are completed in all respects. **(or if the coal firing is delayed, due to no fault of contractor, then guarantee will start 6 months after the completion of trial run and clean air flow test of all mills unit)** However, this 5% amount can be released against Bank Guarantee valid for thr guarantee period of 12 months as aforesaid in the prescribed proforma of BHEL.

6.12.0 No levy or payment or charge made or imposed shall be impeached by reasons for any clerical error or demanded or charged.

6.13.0 BHEL at discretion, may further split up the above percentage and effect payment to suit the site conditions, cash flow requirements, according to the progress of work.

6.14.0 CONTRACTOR SHALL NOTE THAT THE FINAL BILL SHALL BE RELEASED ONLY ON PRODUCTION OF CERTIFICATE ISSUED BY SITE IN CHARGE THAT THE CONTRACTOR HAS FULLFILLED ALL THE CONTRACTURAL STATUTORY REQUIREMENTS.

6.15.0 EXTRA CHARGES FOR MODIFICATION AND RECTIFICATION WORK

a) BHEL may consider payment for extra works on man day basis for such of those works which require major revamping / rework/rectification/modification which is totally unusual to normal erection or commissioning work which are not due to contractor's faulty erection.

b) The contractor may submit his work claim bills (Specifically agreed by BHEL Engineer) along with the labour sheet duly certified by BHEL Engineer at site. But BHEL also got the option to get these work done through other agencies if they so desire. The decision of BHEL in this regard shall be final and binding on the contractor.

6.15.1 All the extra work, if any, carried out should be done by a separate gang which should be identified prior to start of work for certification, of man hours. Daily labour sheets should be maintained and should be signed by contractor's representative and BHEL Engineer. Signing of the labour sheets does not necessarily mean the acceptance of extra works. Only those works which are identified as not usual to normal erection and certified so by the Project Manager, and accepted by designer/supplier or competent authority only will be considered for payment.

6.15.2 The decision of BHEL in this regard shall be final and binding on the contractor.

6.15.3 The following man hour rates will be applicable for modification/rectification work.

6.15.4 Average single man hour rate including overtime if any, supervision, use of tools and tackles and other site expenses and incidentals, including consumables for carrying out any rework, re-vamping as may arise during the course of erection Rs.40/- man hour.

6.15.5 Average single man hour rate including overtime if any, supervision, use of tools and tackles and other site expenses and incidentals excluding consumables for carrying out any rework/revamping as may arise during the course of erection Rs.25/- per man hour.

6.16.6 EXTRA WORK DOES NOT INCLUDE

6.16.7 Nominal dressing of foundations, holes, bases, nuts and bolts, in case of abnormal conditions, this can be mutually discussed before starting of such work.

6.16.8 Extra works are broadly defined as below:

Design changes which will be intimated to the contractor after the start of erection and same refers to dismantling of erected components rectification of components which have been received in damaged conditions during transit, rectification of components wrongly manufactured at work, any other works which do not fall in the scope of this contract.

6.16.9 The decision of BHEL in this regard shall be final and binding on the contractor.

6.17.0 OVER RUN CHARGES

6.17.1 Incase due to reasons not attributable to the contractor, the work gets delayed and completion time gets extended beyond **Fifteen (15)** months from the date of commencement of the work the contractor shall be entitled for over run compensation (ORC) after the expiry of **Fifteen (15)** months. Incase ORC arises the same will apply at **Rs.1,20,000/- (Rupees One lakh twenty thousand only)** per month for extension to the completion period beyond **15** months as stated above duly taking into account the balance work at the end of that period.

6.17.2 The exact period of over run will have to be ascertained before the commencement of grace period.

6.17.3 During the period of over run targets will be fixed on month to month basis, which have to be adhered. In case of any shortfall due to the reasons attributable to the contractor, ORC amount will be proportionately reduced.

6.17.4 The payment of over run charges for extended stay for reasons not attributable to contractor will be subject to achieving the monthly programme of work as mutually agreed upon during the extended stay.

6.18.0 PRICE ESCALATION

6.18.1 The following P.V.C. is applicable from the date of commencement of work.

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

Applicable even if F1 is lesser than FO (Price reduction as applicable)

F0 = New all India average consumer price index published by Labour Bureau, Simla, Government of India for Industrial workers (Base 2001 = 100) applicable for the month of commencement of work.

F1 = All India average consumer price Index published by labour Bureau, Simla, Government of India, for Industrial workers (Base 2001 = 100) applicable for the months under consideration.

P1 = Increase in the billing amount as per the escalation formulae for the particular month of billing.

P0 = Billing amount calculated on the accepted contract rate.

6.18.2 Price escalation as per above formula will be calculated and paid (excluding payments towards extra works and overrun, if any) on month to month basis. BHEL however reserves the right to freeze escalation for that such of duration of delays, from time to time which are entirely attributable to the contractor.

6.18.3 With the provision of price escalation as per the above clauses no claim / compensation on account of any increase whatsoever, (irrespective of whether escalation are steep / unanticipated or not compensated by the above escalation provisions in full towards minimum wages, consumables, electrodes, gases or any other item / reasons) will be payable during the entire period of execution including extended period, if any.

6.18.4 PVC is to be restricted to 10% of the contract value.

6.19.0 FIELD QUALITY ASSURANCE FORMATS

It is the responsibility of the contractor to collect and fill up the relevant FQA Log Sheets of BHEL and present the same to BHEL after carrying out the necessary checks as per the log sheets and obtaining the signature of BHEL/Customer in token of their acceptance.

6.20.0 Taxes and Duties

6.15.1 Value Added Tax (VAT) for the works

Price quoted shall be inclusive of VAT except service tax.

Notwithstanding the fact that this is only an erection service contract not involving any transfer of materials whatsoever and not attracting VAT liability, being labour oriented job work, for the purpose of VAT the contractor has to maintain the complete data relating to the expenditure incurred towards wages etc. in respect of the staff/workers employed for this work as also details of purchase of materials like consumables, spares etc., inter alia indicating the name of the supplier, address and VAT Registration No. and VAT paid for the purchases,etc

The bidder shall get registered with State VAT authorities and the registration certificate shall be forwarded to BHEL immediately after commencement of work. In case the bidder had already registered under respective State VAT, they must quote their registration Number and forward copy of Registration Certificate while submitting this tender. The bidder has to obtain VAT clearance certificate from the concerned authorities, on completion of work and submit along with the final bill as one of the documents for contract closure.

In case the Bidder decides to include any VAT element along with the quoted price, they shall specify (1) The value of VAT included in the quote, (2) the rate of VAT adopted and (3) On what value etc , as additional information, in the price bid.. If no VAT element is included in the price, the same shall be indicated in the quote.

The bidder shall quote very competitive price after taking into consideration of above points.

6.15.2 **Service Tax**

Price quoted shall be exclusive of Service Tax. The service tax as statutorily leviable and payable by the bidder under the provisions of service tax Law / Act shall be paid by BHEL as per bidder claim through various running bills. The bidder shall furnish proof of service tax registration with Central Excise Department specifying the name of services covered under this contract. Registration Certificate should also bear the endorsement for the premises from where the billing shall be done by the bidder on BHEL for this project. The bidder shall obtain prior consent of BHEL before billing the service tax amount.

6.15.3 Other Taxes & Levies

Any other taxes and duties (except VAT & Service Tax) viz. Entry Tax, Octroi, Seigniorage, Licenses, Deposits, Royalty, Stamp Duty, other charges / levies,etc. prevailing / applicable on the date of opening of technical bids and any variation thereof during the tenure of the contract are in the scope of bidder. In case BHEL is forced to pay any such taxes, BHEL shall have the right to recover the same from the bidder either from running bills or otherwise as deemed fit.

6.15.4 New Levies / Taxes

In case Government imposes any new levy / tax after award of the work during the tenure of the contract, BHEL shall reimburse the same at actual on submission of documentary proof of payment subject to the satisfaction of BHEL that such new levy / tax is applicable to this contract.

615.5 Statutory variations

Statutory variations are applicable only in the cases of Value Added Tax and Service Tax. The changes implemented by the Central / State Government in the VAT Act / Service Tax during the tenure of the contract viz. increase / decrease in the rate of taxes, applicability, etc. and its impact on upward revision / downward revision are to be suitably paid/ adjusted from the date of respective variation. The bidder shall give the benefit of downward revision in favour of BHEL. No other variations shall be allowed during the tenure of the contract including extended period, if any.

6.15.6 Direct Tax

BHEL shall not be liable towards Income Tax of whatever nature including variations thereof arising out of this contract as well as tax liability of the bidder and their personnel. Deduction of tax at source at the prevailing rates shall be effected by BHEL before release of payment as a statutory obligation, unless exemption certificate is produced by the bidder. TDS certificate will be issued by BHEL as per the provisions of Income Tax Act.

6.15.7 IMPORTANT CONDITIONS FOR PAYMENT

It may be noted that the first running bill will be released only on production of the following.

1. PF Regn. No.
2. Labour Licence No.
3. Workmen Insurance Policy No.
4. Un Qualified Acceptance for Detailed L.O.I.
5. Initial 50% Security Deposit.
6. Rs. 100/- Stamp Paper for Preparation of contract agreement

6.15.8. All payments due to the contractor shall be made either through “e-Payment” or Account Payee cheque only . The tenderer has to furnish details of his Bank account as certified by the concerned Banker in the format furnished to enable e-payment.

FORM TO BE FILLED BY VENDORS FOR REGISTERING FOR E-PAYMENT

Details of Bank Account details of Contractor for remittance of e-Payment

1	NAME & ADDRESS OF THE CONTRACTOR / SUPPLIER	:
2	BANK A/C NO.	:
3	TYPE OF A/C (CC / CURRENT)	:
4	NAME OF THE BANK	:
5	NAME OF THE BRANCH	:
6	BRANCH CODE	:
7	BANKER'S ADDRESS (BRANCH)	:
8	MICR NO.	:
9	IFSC CODE	

Note : THE ABOVE DETAILS ARE TO BE FURNISHED IN THEIR LETTER HEAD BY THE CONTRACTOR / SUPPLIER, DULY ATTESTED BY THEIR BANKERS.

6.21.0 PROVIDENT FUND & MINIMUM WAGES

6.21.1 Your are required to extent the benefit of Provident Fund to the labour employed by you in connection with this contract as per the Employees Provident Fund and Miscellaneous Provisions Act 1952. For due implementation of the same, you are hereby required to get yourself registered with the Provident Fund authorities for the purpose of reconciliation of PF dues and furnish to us the code number allotted to you by the Provident Fund authorities within one month from the date of issue of this letter of intent. Incase you are exempted from such remittance an attested copy of authority for such exemption is to be furnished. Please note that in the event of your failure to comply with the provisions of said Act, if recoveries therefore are enforced from payments due to us by the customer or paid to statutory authorities by us, such amount will be recovered from payments due to you.

6.21.2 The contractor shall ensure the payments of minimum labour wages to the workmen under him as per the rules applicable from time to time in the state.

6.21.3 The final bill amount would be released only on production of clearance certificate from PF/ESI and labour authorities as applicable.

6.21.4 OTHER STATUTORY REQUIREMENTS

1) The Contractor shall submit a copy of Labour License obtained from the Licensing Officer (Form VI) u/r25 read with u/s 12 of Contract Labour (R&A) Act 1970 & rules and Valid WC Insurance copy or ESI Code (if applicable) and PF code no along with the **first** running bill.

2) The contactor shall submit monthly running bills along with the copies of monthly wages (of the preceding month) u/r78(1)(a)(1) of Contract Labour Rules, copies of monthly return of PF contribution with remittance Challans under Employees Provident Fund Act 1952 and copy of renewed WC Insurance policy or copies of monthly return of ESI contribution with Challans under ESI Act 1948 (if applicable) in respect of the workmen engaged by them.

3) The Contractor should ensure compliance of Sec 21 of Contract Labour (R&A) Act 1970 regarding responsibility for payment of Wages. Incase of "Non-compliance of Sec 21 or non-payment of wages" to the workmen before the expiry of wage period by the contactor, BHEL will reserve its right to pay the workmen under the orders of Appropriate authority at the risk and cost of the Contractor.

4) The Contractor shall submit copies of Final Settlement statement of disbursal of retrenchment benefits on retrenchment of each workmen under I D Act 1948, copies of Form 6-A(Annual Return of PF Contribution) along with Copies of PF Contribution Card of each member under PF Act and copies of monthly return on ESI Contribution – Form 6 under ESI Act1948 (If applicable) to BHEL along with the Final Bill.

5) In case of any dispute pending before the Appropriate authority under I D act 1948, WC Act 1923 or ESI Act 1948 and PF Act 1952, BHEL reserve the right to hold such amounts from the final bills of the Contractor which will be released on submission of proof of settlement of issues from the appropriate authority under the act.

6) In case of any dispute prolonged/pending before the authority for the reasons not attributable to the contractor, BHEL reserves the right to release the final bill of the contractor on submission of Indemnity bond by the contractor indemnifying BHEL against any claims that may arise at a later date without prejudice to the rights of BHEL.

6.22.0 SCOPE OF WORK FINAL PAINTING for BOILER, ESP & ROTATING EQUIPMENT

6.23.1 The scope of work includes supply and application of paints as per the colour code and as per the BHEL's instructions for the components of boiler, ESP, Rotating Equipment and its auxiliaries.

6.23.2 The scope of work shall also include application of final painting of Fans and Mills , ACCOUSTIC INSULATION for Fans as required and specified for the components of rotating machines its auxiliaries .

6.23.3 All exposed metal parts of boiler, equipment including pipings, structures, hand-railing etc. Wherever applicable after installation unless otherwise surface protected, be first painted after thoroughly cleaning all such parts duct, rust, scales, grease, oil and other foreign materials. The same after inspected and approved by BHEL/Customer Engineers shall be released for painting. The thickness of coat shall be measured and should be informed to BHEL The instrument for checking the thickness of coat is to be procured by contractor and should be calibrated after periodical intervals.

6.23.4 The quality of the finish paint shall be as per the standards of ISI or equivalent and the colour is as approved by BHEL/ Customer.

6.23.5 The actual colour to be applied is as per directives of BHEL engineers. The scope of painting includes application of colour bands, lettering the names of the systems, equipments tag nos of valves, marking the directions of flow and other dates required by customer / BHEL at the appropriate place as identified by BHEL / Customer, within the quoted rate.

6.23.6 The contractor has to carry out final painting as per the specification of the customer / consultant. Copy of the painting specification of the customer / consultant is attached as Annexure . In addition to final painting, the contractor has to carry out surface preparation and primary coating within the quoted rate for surfaces where repair / additional / modification work carried out as per the Customer / Consultant Specification.

6.23.7 Required Paints, thinner and brush, emery sheets, platform materials and other consumables shall be arranged by the contractor at his cost.

6.23.8 If needed and insisted either by BHEL / Customer in certain cases spray painting has to be carried out within the Quoted rates.

6.23.9 Before commencement of final painting, contractor has to obtain written clearance from BHEL / Customer for surface preparation.

6.23.10 Contractor has to procure paints from the BHEL/ Customer approved agencies only, and the paints should be as per the customer painting specification. The Contractors has to keep in mind that paints of reputed makes like BERGER, ASIAN, SHALIMAR, JENSON & NICHOLSON are only permitted. Before procurement of paint the contractor has to obtain the clearance from BHEL Engineer.

6.23.11 Before applying the subsequent coats, the thickness of each coat shall be measured and recorded with BHEL/ Customer. The instrument for checking the thickness of the coat is to be procured by the contractor and should be calibrated after periodic intervals.

6.24.0 SCOPE OF WORK FOR PRESERVATION OF MATERIALS AT STORES, IF REQUIRED

6.24.1 PRESERVATION OF COMPONENTS

Components are received duly painted from manufacturing unit. Due to handling or deterioration due to life of paint or deterioration due to climatic / storage condition etc., paint may get peeled off or rubbed off. This needs preservation to avoid further rusting of components. Also, during this activity, the painting / repainting of W.O. No. and other relevant particulars that may need to be painted on the components is also covered with in the scope of work.

This may call for handling / re handling of materials. All materials consumables, including, manpower, tools and plant required for this work has to be provided by the contractor. Required preservative paints for the purpose of preservation, will be supplied by BHEL, free of cost. Crane, forklift or any other handling equipment as may be required shall be arranged by the contractor at their cost. BHEL will not provide any T & P, for this scope of Work. Other consumables such as brush, kerosene, emery paper etc., required for surface preparation before application of preservative is in contractors scope.

SECTION VII – APPENDIX I
PROJECT : RINL VISAKHAPATNAM RATING: 330 TPH
Welding Schedule

VIZAG STEEL PLANT 1x330 T/Hr				
CUST No.: 0495				
SITE JOINT DETAIL				
Sl.No	**Pipe/Tube size**	**Matl.Specn.**	**No.of Joints**	**System**
1	Tube Dia 63.5x4.8	SA210 GR.C	**2206**	WW Panels & Platen
2	Pipe Dia 127x10	SA106 GR.C	**288**	Riser Pipes
3	Tube Dia 76.1x7.1	SA210 GR.C	**270**	Rear Arch, Screen & Hanger tubes
4	Pipe Dia 219.1x14.2	SA106 GR.C	**6**	WW Platen Downcomer pipes
5	Pipe Dia 323.9x25	SA106 GR.C	**20**	WW Downcomer pipes
6	Pipe Dia 323.9x32	SA106 GR.C	**4**	Bottom Ring Headers
11	Pipe Dia 219.1x22.2	SA 106 GA C	**6**	Eco. System
12	Tube Dia 44.5x4.5	SA 210 GA A1	**864**	Eco. coil
13	Tube Dia 54x5.0	SA 213 T11	**201**	Rad. Roof tubes
14	Tube Dia 127x10.0	SA 210 GR C	**36**	Sat. conn. Link
15	Pipe Dia 219.1x22.23	SA 210 GR C	**2**	Hdrs
16	Tube Dia 44.5x4.5	SA 210 GR C	**968**	S.C.Side wall panels
17	Pipe Dia 273x32	SA 210 GR C	**2**	S.C.Spacer bottom hdrs
18	Tube Dia 44.5x4.5	SA 213 T11	**1056**	LTSH Coil
19	Pipe Dia 323.9x40	SA 335 P12	**4**	DESH. Links
20	Tube Dia 38x6.0	SA 213 T11	**64**	Platen coil
21	Tube Dia 51x4.0	SA 213 T11	**128**	Platen coil
22	Pipe Dia 323.9x40	SA 335 P12	**6**	DESH. Links
23	Tube Dia 51x5.6	SA 213 T11	**260**	Final SH.Coil.
24	Tube Dia 51x9.0	SA 213 T22	**130**	Final SH.Coil.
25	Tube Dia 44.5x4.5	SA 213 T11	**20**	Steam cooled spacer tube

The welding details provided is approximate there will be variation in number of joints indicated and depends on site routed conditions while contractor has to take care of such variations . The will be made based on the tonnage quoted by bidder.

VIZAG STEEL PLANT 1x330 T/Hr						
CUST No.: 0495						
SITE JOINT DETAIL						
Sl.No	**Pipe/Tube size**	**Matl.Specn.**	**No.of Joints**	**System**	**RT**	
1	Tube Dia 63.5x4.8	SA210 GR.C	**2206**	WW Panels & Platen	10%	
2	Pipe Dia 127x10	SA106 GR.C	**288**	Riser Pipes	100%	
3	Tube Dia 76.1x7.1	SA210 GR.C	**270**	Rear Arch, Screen & Hanger tubes	10%	
4	Pipe Dia 219.1x14.2	SA106 GR.C	**6**	WW Platen Downcomer pipes	100%	
5	Pipe Dia 323.9x25	SA106 GR.C	**20**	WW Downcomer pipes	100%	
6	Pipe Dia 323.9x32	SA106 GR.C	**4**	Bottom Ring Headers	100%	
11	Pipe Dia 219.1x22.2	SA 106 GA C	**6**	Eco. System	100%	
12	Tube Dia 44.5x4.5	SA 210 GA A1	**864**	Eco. coil	10%	
13	Tube Dia 54x5.0	SA 213 T11	**201**	Rad. Roof tubes	10%	
14	Tube Dia 127x10.0	SA 210 GR C	**36**	Sat. conn. Link	100%	
15	Pipe Dia 219.1x22.23	SA 210 GR C	**2**	Hdrs	100%	
16	Tube Dia 44.5x4.5	SA 210 GR C	**968**	S.C.Side wall panels	10%	
17	Pipe Dia 273x32	SA 210 GR C	**2**	S.C.Spacer bottom hdrs	100%	
18	Tube Dia 44.5x4.5	SA 213 T11	**1056**	LTSH Coil	10%	
19	Pipe Dia 323.9x40	SA 335 P12	**4**	DESH. Links	100%	
20	Tube Dia 38x6.0	SA 213 T11	**64**	Platen coil	10%	
21	Tube Dia 51x4.0	SA 213 T11	**128**	Platen coil	10%	
22	Pipe Dia 323.9x40	SA 335 P12	**6**	DESH. Links	100%	
23	Tube Dia 51x5.6	SA 213 T11	**260**	Final SH.Coil.	10%	
24	Tube Dia 51x9.0	SA 213 T22	**130**	Final SH.Coil.	10%	
25	Tube Dia 44.5x4.5	SA 213 T11	**20**	Steam cooled spacer tube	10%	

RINL –EXPANSION 330 T /HR BOILER

WEIGHT SCHEDULE

TOTAL SCHEDULE OF WEIGHTS

SL NO	DESCRIPTION	WEIGHT IN MT (APPROX)
1	PRESSURE PARTS	1117
2.	NON PRESSURE PARTS	3480
3.	ESP	2024
4.	ROTATING EQUIPMENTS	611
	TOTAL WEIGHT	**7232**

PGMA DESCRIPTION IS FOR INFORMATION

PG	DESCRIPTION	Weight (MT)	
09	Seal Boxes	8	NPP
20	Soot Blowers	20	NPP
35	Boiler Supporting Structure	778	NPP
36	Galleries and Stair Ways	578	NPP
38	Interconnecting Walk Ways	146	NPP
39	External Structures (Supporting Structures for ID System)	563	NPP
41	Oil and Gas Burners, Ignitors and Scanners	2	NPP
42	Oil and Gas System	338	NPP
43	Ignitor and Scanner Air System	21	NPP
45	Coal Burner System	50	NPP
47	Pulverised Fuel Piping	153	NPP
48	Ducts, Dampers & Expansion Joints	456	NPP
50	Steam Coil Airheater / Tubular Airheater	5	NPP
52	Conventional Large Heaters (Regenerative Trisector AH)	249	NPP
57	Ducts& Dampers	86	NPP
81	Tanks and Vessels (Pipe Lines)	15	NPP
99	Lifting Tackles	13	NPP
	NON PRESSURE PARTS TOTAL	**3480**	
04	Boiler Drum (s)	49	PP
05	Water Wall Headers & Drums	39	PP
06	Water Wall Panels	164	PP
07	Circulation System Components	92	PP
08	Buckstays and Framing	97	PP
10	Superheater Headers	42	PP
11	Superheater Coils and Walls	254	PP
12	Superheater Components	41	PP
18	Roof Skin Casing	8	PP
19	Economiser	201	PP
21	Soot Blower and Soot Blowing System	12	PP
24	Boiler Integral Piping and Fittings	54	PP
28	Man Holes and Furnace Openings	6	PP
31	skin casing (31-010, 31-102, 31-104)	8	PP
80	External Pipe Lines	**50**	PP
	PRESSURE PARTS TOTAL	**1117**	
55	Axial Fans	37	RM
56	Radial Fans -	127	RM
65	Coal Feeders -	21	RM
67	Mill Plant Auxiliaries	26	RM
xx	Mills	300	RM
	Motors for Mills/Fans	100	RM

	ROTATING MAACHINES TOTAL	**611**	
78	Electrostatic Precipitator	1938	ESP
89	Gallaries and Stair Ways for Dust Collectors	41	ESP
XXX	ESP Transformers	45	ESP
	ESP TOTAL	**2024**	
	TOTAL ERECTION WEIGHT FOR THE PACKAGE	**7232**	

Note

PP-pressure parts , **NPP-** N0n Pressure parts
RM-Rotating machines
ESP-Electro Static Precipitator

Note to weight schedule

1. The weights mentioned above are approximate and are liable to vary as per design consideration. There will be change in PG, weight, description etc., however the payments will be made to them for the tonnage actually erected at the quoted rate.

2. Besides the PG indicated above there is likely hood of addition of product groups integral to Boiler (Main & Aux.) and its aux. The quoted rate shall be applicable for such product group also

3. Fixing Components for Insulation : The scope of work covers welding of all attachment on the pressure parts for fixing insulation & refractory

4. The Erection & dismantling of temporary piping, Pumps, tanks, dummy plates & other misc. equipments etc., for pre commissioning & commissioning activities like Hydraulic Test, Chemical Cleaning, Steam Blowing etc., are covered in this contract and shall be carried out with in the quoted tonnage rate.

SECTION – VII APPENDIX - II

LIST OF TOOLS AND PLANTS TO BE PROVIDED BY BHEL FREE OF HIRE CHARGES ON SHARING BASIS

The following T & P will be provided to the Contractor on sharing basis at free of cost.

Sl. No	Description	Qty
1.	75 T crane or suitable higher capacity crane	2 No
2	Huck Bolting Machine	1 No
3	Chemical Cleaning pumps with accessories	As required
4	Acid Transfer pump with accessories	As Required
5	High Pr.Hydro test Pump with accessories	1 No
6	Blower for Gas tightness test	1 No.

Note : i. For operation of 75 T Crane, Contractor will provide crane operator at his cost. For operation of high capacity crane (higher than 75 T) BHEL will provide crane operator. The contractor has to provide two assistant/helpers for operation of the cranes at his cost.

ii. For the Cranes, Contractor has to arrange Fuel and lubricants at his cost.

iii. In case BHEL provides hired cranes, the following fuel charges will be deducted from contractors bill.

a. 75 T Crane Rs. 150 per Hour
b. 135 or 150 T crane Rs. 250 per Hour
c. Higher capacity cranes Rs. 300 per Hour

IN ADDITION,

1 No. COMPUTER WITH OPERATOR IS TO BE PROVIDED BY CONTRACTOR WITHIN THE QUOTED RATE.

NOTE

1) All the above T&Ps shall be given to contractor on sharable basis and the allotment is made by BHEL/Site in Charge, on need basis. The contractor shall provide experienced operator,fuel, lubricants and carrying out daily maintenance with in the quoted rates.

2) Incase of non-availability of these equipments, due to any reason ie., unavoidable breakdown, major overhaul or any other reason etc., the contractor should make arrangement at his own cost to meet the erection targets. No extra claim will be admitted due to non-availability of any of the above equipments. No delay in execution of work shall be accepted on this account..

3) Cranes are only for erection purpose and shall not be available for material handling and for transportation purpose for which contractor shall make his own arrangement.

4) The day-to-day and routine maintenance including replacement of spares for the BHEL T&Ps will be carried out by the contractor at his own cost. However, BHEL shall supply spare parts free of charges for normal wear and tear only.

5). Any loss/damage of tools by the contractor shall have to be replaced or otherwise cost thereof shall be recovered from the contractor.

Apart from the above, any other tools and plants required for satisfactory completion of the work has to be arranged by the contractor.

SECTION VII
APPENDIX – III
PAINTING SCHEME

GENERAL GUIDELINE FOR GOOD PAINTING PRACTICES

DO's

1. Painting is an important value adding activity. Give it all your care.

2. Store paints in covered places. Avoid direct exposure to sunlight.

3. The validity of the shelf-life of the paint shall be ensured before use.

4. The paint drum shall be rolled several times to ensure thorough mixing of the paint before opening.

5. The lid of the drum shall be opened using proper tools.

6. The homogeneity of the paint shall be ensured by further stirring, after opening the lid of the drum.

7. If a paint (within shelf life period) is seen to have solid lumps, when the can is opened, stir the paint thoroughly until the lumps disappear. If persists, contact Stores from where the paint has been drawn.

8. Whenever a new scheme / source of paint is used, the painter shall read, understand & follow the specific instructions on the paint can or literature.

9. Only the required quantity of the paint shall be taken in separate container & the paint drum shall be immediately recapped properly.

10. In case of two pack system, to ensure proper ratio of mixing as gicen in the supplier's literature or as written on the drums.

11. Thinner prescribed by the supplier shall only be used. For ready mixed paints, use without thinner, unless otherwise specified.

12. The quantity of compressed air shall be checked for its purity (freedom from moisture and oil) prior to spray painting.

13. Only clean brushes of definite size shall be used for painting.

14. In the case of new brushes, the bristles shall be cleaned well in the thinner before they are used for painting.

15. Painting shall be done in a well ventilated area.

16. Proper surface preparation required for the paint to be applied shall be ensured before it is being painted.

17. Blasted surface shall be painted within 4 hours after blasting.

18. The surface shall be ensured to be free from oil and grease.

19. The number of coats, shade, dry film thickness and intercoat curing time interval shall be as specified. Clarify with Plant Lab, if needed.

20. Wipe the primer applied surface with a cloth just before finish coat painting.

21. The spray gun shall be held 6 inches to 8 inches away from the substrates during painting.

22. In case of two pack systems, the mixed paints shall be used before the expiry of its pot life.

23. Surface preparation, application of primer and finish coat shall be stage inspected and cleared by the QC personnel concerned.

24. Preserve the balance thinned paints in a separate closed container for future use, if they donot have any restricted pot life.

25. Clean the brush before and immediately after painting. Keep them clean during interruptions too.

26. Apply a coat of weldable primer at site weld edge preparation zones

27. Use appropriate safety appliances for painting viz., tace masks (for spray guns), nose respirator, gloves etc.

28. **DON'Ts**

1. Do not use the paint which has crossed its expiry date.

2. Do not draw more paint than necessary form the Stores.

3. Do not make holes in the drum to draw the paint.

4. Do not keep the paint drum open for a long time.

5. Do not inter-change the thinners for the same generic paint between suppliers.

6. Do not use kerosene as thinner.

7. Do not smoke while painting.

8. Do not leave the brush without cleaning after painting.

9. Do not paint close to a welding area.

10. Do not paint when there is rain or sand storm or when the relative humidity is about 90%.

11. Do not paint when the metal is chill or very hot.

11. Do not paint when the surface is not cleaned / prepared for painting requirements.

12. Do not paint the finish coat if the primer coat is not satisfactory.

13. Do not leave the balance paint open after painting.

ANNEXURE - 3

PAINTING SYSTEM

System No.	Description	Nature of exposure	Treatment in the shop				Treatment at site				Total DFT in microns (shop & site)
			Surface quality	No.of coats	DFT/coat in microns	Paint system	Surface quality	No.of coats	DFT/coat in microns	Paint system	
7.1	General service painting	Normal atmospheric environment non-corrosive atmosphere									
7.1(I)	Non-load bearing structural steelwork such as partitions, minor platforms, walkways, ring ladders pipe/cable support brackets etc. Location - all indoor temperature less than 80° C		St 2 or St 3	2 P	35	Oil based red lead or zinc chromate/zinc phosphate anticorrosive primer	Clean and retouch	1 F	30	Synthetic enamel of long oil alkyd resin based paint	155
				1 I	55	Dust preventive paint based on modified phenoloc resin with MIO					
7.1(II)	Steel doors, windows etc. of regular handling		St 3	1 P	30	Red lead based two component epoxy polyamide paint	Clean and retouch	1 F	50	High build two component epoxy polyamide with MIO	170
				1 I	50	High build two component epoxy polyamide with MIO		1 F	40	Two component polyurethane	
7.2	Wearing surface painting										
	Painting of floor plates, walkways, staircase treads handrailing etc. which are prone to mild abrasion	Light corrosive atmosphere									
7.2(I)	Floor plates/walkways/staircase treads etc.										
	Top surface temperature less than 80° C		Sa 2.5	1 P	15-20	Weldable shop alkyd primer (optional)					
				1 P	70-80	PVC-copolymer-alkyd resin-zinc chromate	Clean and retouch	2 F	40-50	PVC-copolymer alkyd resin	220-260 (Excluding weldable primer coat)
				1 I	70-80	PVC-copolymer alkyd resin with MIO					
						OR					
			Sa 2 or St 3	WP	15	Long exposure type zinc chromate based vinyl	Clean and retouch	1 F	120-130	High build coal tar epoxy with polyamide hardner	230-270 (Excluding wash primer)

Annexure-3 (cont'd)

System No.	Description	Nature of exposure	Treatment in the shop				Treatment at site				Total DFT in microns (shop & site)
			Surface quality	No.of coats	DFT/coat in microns	Paint system	Surface quality	No.of coats	DFT/coat in microns	Paint system	
						butynal resin varnish wash					
				2 P	30-40	Dust preventive red lead/zinc chromate based epoxy polyamide					
				1 I	50-60	Dust preventive epoxy ester paint with MIO					
7.2(II)	Floor plates/walkways/staircase trends etc. Both surface: temperature less than 80° C	Light corrosive	Sa 2.5	1 P	15-20	Weldable shop alkyd primer (optional)	Clean and retouch	1 F	40-50	PVC-copolymer resin	180-210 (Excluding weldable primer)
				1 P	70-80	PVC-copolymer alkyd resin-zinc chromate					
				1 I	70-80	PVC-copolymer alkyd resin with MIO					
						OR					
			Sa 2	1 P	15	Long exposure type zinc chromate based vinyl butynal resin varnish wash	Clean and retouch	1 F	120-130	High build coal tar epoxy with polyamide	200-230 (excluding wash primer)
				1 P	30-40	Dust preventive red lead/zinc chromate based epoxy ester resin varnish					
				1 I	50-60	Dust preventive epoxy ester paint with MIO					

System No.	Description	Nature of exposure	Treatment in the shop				Treatment at site				Total DFT in microns (shop & site)
			Surface quality	No.of coats	DFT/coat in microns	Paint system	Surface quality	No.of coats	DFT/coat in microns	Paint system	
7.2(iii)	Floor plates/walkways/staircase treads etc.										
	Top and bottom surface - temperature less than 80° C	Extreme corrosive atmosphere	Sa 2.5	1 P	15-25	Weldable epoxy based, shop primer					
				1 P	30-40	Two component epoxy polyamide - zinc chromate	Clean and retouch	2 F	30-40	Two component epoxy polyamide	180-230 (excluding weldable primer)
				1 I	50-60	Two component epoxy polyamide with MIO		1 F	40-50	Two component polyurethane	
7.2(iv)	Hand railing (site fabricated)	Light corrosive	Nil				St 3	2 P	40	Read lead epoxy	160
								2 F	40	Two component epoxy polyamide	
7.3	Light corrosive service painting	marine industrial atmosphere in tropical climate, or mild corrosive environment due to presence of mild acidic fumes and gases from neighbouring plant									
7.3(I)	Structural steelwork for plant and shop building: temperature less than 80° C	Light corrosive	Sa 2.5	1 P	15-25	Weldable epoxy based shop primer					
				2 P	30-40	Red oxide - zinc chromate/non-leafing aluminium based chlorinated rubber plant	Clean and retouch	2 F	30-40	Chlorinated rubber resin varnish with weather resisting pigments	170-210 (excluding weldable epoxy primer)
				1 I	50-60	High build chlorinated rubber paint with MIO					

Annexure-3 (cont'd)

System No.	Description	Nature of exposure	Treatment in the shop				Treatment at site				Total DFT in microns (shop & site)
			Surface quality	No.of coats	DFT/coat in microns	Paint system	Surface quality	No.of coats	DFT/coat in microns	Paint system	
7.3(II)	Miscellaneous technological steel structure such as conveyor galleries, pipe trestles etc. indoor and outdoor: temperature less than 80° C	Light corrosive	Sa 2.5	1 P	15-25	Weldable epoxy based shop primer	Clean and retouch	2 F	30-40	Chlorinated rubber with weather resisting pigments	170-210 (excluding weldable epoxy primer)
				2 P	30-40	Red oxide - zinc chromate/non-leafing aluminium based chlorinated rubber					
				1 I	50-60	High build chlorinated rubber with MIO					
7.3(III)	Manufactured equipment and its associated structures such as vessels, bunkers, exchangers, heaters, furnace, pumps, cranes, stacks etc.	Light corrosive	Sa 2.5	1 P	15-25	Weldable shop alkyd primer (optional)					
				1 P	70-80	PVC - copolymer alkyd resin with zinc chromate	Clean and retouch	1 F (optional)	40-50	PVC - copolymer alkyd with weather resistant pigment and of glossy finish	180-210
	- Non-insulated: temperature less than 80° C			1 I	70-80	PVC - copolymer alkyd resin with MIO					
				1 P	40-50	PVC - copolymer alkyd resin with weather resistant pigments and of glossy finish					
						OR					
			Sa 2.5	1 P	15-25	Weldable epoxy based shop primer (optional)	Clean and retouch	1 F (optional)	25-30	Chlorinated rubber paint with weather resisting pigments of glossy finish	150-180
				2 P	25-30	Red lead/zinc chromate based epoxy primer					
				1 I	50-60	Dust preventive epoxy ester resin paint with MIO					
				2 P	25-30	Chlorinated rubber paint with weather resisting pigments of glossy finish					

Annexure-3 (cont'd)

System No.	Description	Nature of exposure	Treatment in the shop				Treatment at site				Total DFT in microns (shop & site)
			Surface quality	No.of coats	DFT/coat in microns	Paint system	Surface quality	No.of coats	DFT/coat in microns	Paint system	
	- Temperature 80° - 150° C		Sa 2.5	1 P	60-70	Zinc ethyl silicate					
				1 F	60-70	High build epoxy polyamide enamel	Clean and retouch	1 F (optional)	60-70	High build up polyamide enamel	130-140
	- Temperature over 150° C		Sa 3	1 P	60-70	Zinc ethyl silicate	Clean and retouch	1 F (optional)	15-20	Silicon - aluminium	90-110
				2 P	15-20	Silicon - aluminium					
	- Insulated surfaces										
	Temperature less than 80° C		Sa 2.5	Same as of non-Insulated surface but without any finish coat			Clean and retouch				100-120
	Temperature over 80° C		Sa 3	1 P only	60-70	Zinc ethyl silicate	Clean and retouch				60-70
7.3(iv)	Overground pipework inclusive of pipes, fittings, hangers, cable ducts, gas ducts etc.	Light corrosive									
	Non-insulated pipework :										
	- Indoor and outdoor temperature less than 80° C		St 2 or 3	2 P	40	Red lead/zinc chromate based epoxy resin primer	Clean and retouch	2 F	30	Chlorinated rubber with weather resisting pigments	140
	- Indoor and outdoor temperature between 80° C and 150° C		Sa 3	1 P	60-70	Zinc ethyl silicate	Clean and retouch	1 F	40	Two component epoxy polyamide enamel	100-110
	- Indoor and outdoor temperature between 80° C and 150° C		Sa 3	1 P	60-70	Zinc ethyl silicate	Clean and retouch	2 F	15	Silicon - aluminium	90-100
	Insulated pipework :										
	- Indoor and outdoor temperature less than 80° C		St 2 or 3	2 P	40	Red lead/zinc chromate based epoxy resin primer	Clean and retouch	-	-	No finish coat	80
	- Indoor and outdoor temperature over 80° C		Clean	1 P	40-60	Corrosion protective wax/grease					40-60

Annexure-3 (cont'd)

System No.	Description	Nature of exposure	Treatment in the shop				Treatment at site				Total DFT in microns (shop & site)
			Surface quality	No.of coats	DFT/coat in microns	Paint system	Surface quality	No.of coats	DFT/coat in microns	Paint system	
7.4	Extreme corrosive service painting	Strongly corrosive atmosphere due to presence of inorganic and organic acids, alkalis, salts, corrosive vapours and fumes etc.									
7.4(I)	Equipment such as process, vessels, pumps etc. and its associated structure in handling and treatment area, neutralising area etc. where acids/ alkalis/miscellaneous chemicals are handled	Extreme corrosive	Sa 2.5	1 P	15-20	Zinc phosphate - weldable epoxy primer (optional)	Clean and retouch	1 F (optional)	30-40	Two component polyurethane	170-180 (weldable primer coat excluded)
				2 P	30-40	Two component - epoxy polyamide - zinc chromate					
	Temperature below 150° C			1 I	50-60	Two component: high build epoxy polyamide with MIO					
				1 F	30-40	Two component epoxy polyamide enamel					
				1 F	30-40	Two component polyurethane					
7.4(II)	Overground pipework inclusive of pipes, fittings, supports, hangers, cable ducts, gas ducts etc.	Extreme corrosive									
	Non-insulated pipe/duct work :										
	- Indoor and outdoor temperature below 150° C		Sa 2.5	1 P	40	Two component epoxy polyamide zinc chromate	Clean and retouch	2 P	50	Two component epoxy polyamide enamel	190-200
				1 I	50-60	Two component epoxy polyamide with MIO		1 P	40	Two component polyurethane	
	- Indoor and outdoor temperature over 150° C		Sa 3	1 P	40-70	Zinc-ethyl silicate	Clean and retouch	2 P	15	Silicone aluminium	90-100

Annexure-3 (cont'd)

System No.	Description	Nature of exposure	Treatment in the shop				Treatment at site				Total DFT in microns (shop & site)
			Surface quality	No.of coats	DFT/coat in microns	Paint system	Surface quality	No.of coats	DFT/coat in microns	Paint system	
	Insulated pipe/duct work :		Same as of non-insulated pipe/duct work						No finish coat		90
	- Indoor and outdoor temperature below 150° C										
	- Indoor and outdoor temperature over 150° C		Clean	1	40-60	Corrosion protective wax or grease					40-60
7.5	Hot surface painting										
	Temperature above 80° C	Environment may be light or extreme corrosive similar to system no. 7.3 and 7.4 respectively				Painting shall follow according to system no. 7.3 and system no. 7.4 depending on temperature conditions and nature of environment					
7.6(I)	Mill machineries, heavy equipment and accessories										
	Temperature upto 150° C	For all environment	Sa 2.5	2 P	25-30	Two component epoxy polyamide zinc chromate	Clean and retouch	1 F (optional)	40-50	Two component epoxy polyamide enamel	180-220
				1 I	50-60	Two component epoxy polyamide with MIO					
				2 P	40-50	Two component epoxy polyamide enamel					
7.6(II)	Light machineries, such as general working machineries, machine tools etc.										140-170
	Indoor location and temperature upto 80° C	Light corrosive environment due to handling of mineral oils, vegetable oils, grease etc.	Sa 2	2 P	25-30	Phenolated alkyd with zinc chromate	Clean and retouch				
				1 I	40-50	Phenolated alkyd based under coat with MIO					
				2 P	25-30	High gloss styrenated alkyd enamel					

Annexure-3 (cont'd)

System No.	Description	Nature of exposure	Treatment in the shop				Treatment at site				Total DFT in microns (shop & site)
			Surface quality	No.of coats	DFT/coat in microns	Paint system	Surface quality	No.of coats	DFT/coat in microns	Paint system	
7.7	Switchboard/control panel painting										
7.7(I)	This includes fabricated sheet metal item such as switchboard, control panel, control desks, cabinet, starters, small electric machineries etc.	For all environment	Pickling or Sa 2.5 phosphate treatment	1 P	25	Zinc chromate - butyrated melamine - alkyd resin baking primer					
				1 I		Aminoalkyd resin putty					75
				2 P	25	Aminoalkyd resin baking enamel paint					
7.7 (II)	Electric motors, transformers etc.										
	- Indoor and outdoor installation	For all environment	Sa 2.5	2 P	25-30	Two component epoxy polyamide zinc chromate	Clean and retouch	1 F (optional)	30-40	Two component epoxy polyamide or polyurethane	160-200
	- Temperature less than 150° C			1 I	50-60	Two component epoxy polyamide with MIO					
				2 P	30-40	Two component epoxy polyamide or polyurethane					
7.8	Metallic Coating Protection System										
	This system is applicable for protection of permanent structures, which cannot be conveniently repainted, such as transmission towers, outdoor electric substations structures, pipe tressels, poles, etc.		Pickling followed by metallic coaging								

Note:

(1) Legend : surface quality : Surface preparation grade as per SIS 05 5900 or equivalent, P : Primer cost, I : Intermediate coat, F : Finish coat DFT : Dry film thickness in microns, MIO ; Micaceous iron oxide, WP ; Wash primer.

(2) Clean and retouch shall mean cleaning of contaminants related to the metal (rust) to St 3 grade and cleaning of all contaminants other than metal such as weld moisture, slag electrode deposition etc., retouching shall be of same number and kind of shop coat.

SECTION – VII

APPENDIX – IV

ERECTION OF BOILER STRUCTURES AND POINTS TO BE TAKEN CARE OF FOR ACHIEVING VERTICALITY OF BOILER COLUMNS

The column pieces are pre-assembled at site and match marks are to be provided. :-

1. Pre-assembly, checks to detect and deviations in the columns like length, camber sweep, twist etc.

2. Checking of the foundations for its levels, distance, diagonal distance etc.

3. Proper tightening of the foundation bolts.

4. Erection of columns tier by tier and box by box. Grouting to be done immediately.

5. Ensuring the availability of adequate guy ropes. Pull lifts etc, during column erection and the removal of guy ropes to be done after tie up of the columns with adjacent columns after ensuring their verticality

6. Using a calibrated theodolite for verticality measurement of the columns and cross checking these readings with plumb bob at random.

7. Tightening of HSPG bolts to be done by turnoff nut method only. This should be done only in position after ensuring the verticality of the columns.

8. Measuring the adjacent diagonals of the ceiling girders after its erection.

9. Ensuring the verticality of the columns before and after drum lifting.

The above will enable to achieve verticality of columns which in turn will enable to achieve correct furnace dimensions.

SECTION VII

APPENDIX – V

DECLARATION SHEET

I, hereby certify that, all the information and data furnished by me with regard to this Tender Specification No.BHEL:PSSR:SCT:1319 are true and complete to the best of my knowledge. I have gone through the specifications, conditions, stipulations in detail and agree to comply which the requirements and intent specifications.

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

TENDERER'S NAME & ADDRESS

AUTHORISED REPRESENTATIVE'S
SIGNATURE WITH NAME & ADDRESS

SECTION VII

APPENDIX – VI

TENDER SPECIFICATION NO BHEL:PSSR:SCT:1319

CERTIFICATE OF DECLARATION FOR CONFIRMING KNOWLEDGE ON SITE CONDITIONS

We,

hereby declare and confirm that we have visited the project site under subject, namely and acquired full knowledge and information about the site conditions. We further confirm that the above information is true and correct and we will not raise any claim of any nature due to lack of knowledge of site conditions.

TENDERER'S NAME AND ADDRESS

Place:

Date :

SIGNATURE OF AUTHORISED REPRESENTATIVE WITH NAME & ADDRESS:

OFFICE SEAL

BHARAT HEAVY ELECTRICALS LIMITED
(A Government of India Undertaking)
Power Sector: Southern Region
690, Anna Salai, Nandanam, Chennai – 600 035.

SECTION VII

APPENDIX -VII

CHECK LIST

TENDER SPECTFICATION NO, BHEL: PSSR : SCT : 1319

Tenderers are required to fill in the following details:

1.	a)	Name of the Tenderer with address	:	YES/NO
	b)	Telegraphic/Telex address	:	YES/NO
	c)	Phone (Office/Residence)	:	YES/NO
	d)	Management Structure of firm (Pvt. Ltd/Public Ltd./Partnership/Sole Proprietorship) Documentary proof For the same enclosed)	:	YES/NO
2.		Whether EMD submitted as per Tender specifications terms and Conditions	:	YES/NO
3.		Validity of offer (offer shall be kept open for acceptance for minimum six months)	:	YES/NO
4.		Whether tenderer visited the erection site and acquainted with the site conditions before quoting	:	YES/NO

SIGNATURE OF THE TENDERER

5.	Whether the following details are furnished		:	YES/NO
	a)	Previous Experience	:	YES/NO
	b)	Present assignments	:	YES/NO
	c)	organization chart of the company	:	YES/NO
	d)	Company financial statue	:	YES/NO
	e)	Incase of company, proof of Registration of the company	:	YES/NO
	f)	Memorandum & Articles of Association of company/copy of Partnership deed	:	YES/NO
	g)	Profit & Loss account for the Last 3 years	:	YES/NO
	h)	Audited Balance sheet for the Last 3 years	:	YES/NO
	i)	Income Tax clearance certificate (latest)	:	YES/NO
	j)	Solvency Certificate from a Nationalised Bank	:	YES/NO
	k)	Power of Attorney of the person Signing the tender duly attested By a Notary Public	:	YES/NO
	l)	Manpower organization chart With deployment plan at site For posting of Engineers/super Visitors and workers/labourers For satisfactory completion of Work under this specification	:	YES/NO

SIGNATURE OF THE TENDERER

6.	Whether the Tenderer is conversant with local labour laws & conditions	:	YES/NO
7.	Whether the tenderer is aware of all safety rules and codes	:	YES/NO
8.	Whether the Declaration sheet (as per appendix enclosed	:	YES/NO
9.	Time required for mobilization of of site organization and start of work	:	YES/NO
10.	Whether list of tools and Plants available with the contractor and proposed to be deployed for this work enclosed	:	YES/NO
11.	Whether all the Pages are read understood and signed.	:	YES/NO
12.	Deviations, if any Pointed out	:	
13.	Whether PF exemption No. is allotted by RPFC of your area if so, indicate number	:	YES/NO

SIGNATURE OF THE TENDERER

TENDER SPECIFICATION

BHEL:PSSR:SCT: 1319

FOR

Handling at Site Stores / Storage yard, Transportation to Site of Work, Erection, Testing and Commissioning of Complete Boiler consisting of Boiler Structures, Pressure Parts, its auxiliaries, Electrostatic Precipitator and Rotating Equipments, Including Supply and Application of Final Painting of 1 x 330TPH boiler

at

Rashtriya Ispat Nigam Limited (RINL) –Visakhapatnam

PART – II PRICE BID

BOOK NO :

BHARAT HEAVY ELECTRICALS LIMITED
(A Government of India Undertaking)
Power Sector – Southern Region
690, Anna Salai, Nandanam, Chennai – 600 035

BHARAT HEAVY ELECTRICALS LIMITED
(A Government of India Undertaking)
Power Sector, Southern Region
690, Anna Salai, Nandanam, Chennai – 35

TENDER SPECIFICATION NO:BHEL:PSSR:SCT:1319

NAME OF WORK

Handling at Site Stores / Storage yard, Transportation to Site of Work, Erection, Testing and Commissioning of Complete Boiler consisting of Boiler Structures, Pressure Parts, its auxiliaries, Electrostatic Precipitator and Rotating Equipments, Including Supply and Application of Final Painting of 1 x 330TPH boiler At Rashtriya Ispat Nigam Limited (RINL) –Visakhapatnam

(PRICE BID)

PART II

Issued to
M/s.

For and on behalf of
BHARAT HEAVY ELECTRICALS LIMITED

Additional General Manager/Contracts

(This tender document is not transferable)

Place: Chennai-600 035.
Date:

SECTION VII APPENDIX - VIII

RATE SCHEDULE

BHEL:PSSR:SCT: 1319

Sl.No	Description of work	Appx. Weight in MT	Unit Rate / MT Rs.	Total Amount Rs.
1	Erection, Testing and Commissioning supply and application of final painting and completion of trial operations of the Boiler, ESP and its auxiliaries including supporting structures, columns, Stairways, floor Grills, hand rails etc. and also the external platforms as per detailed Description and nature of work as enumerated in the BHEL drawings including supply of necessary consumables, Tools and tackles, (other than provided by BHEL) all handling and Transportation from BHEL/customer stores, storage yard preservation of components in erection site and other incidental works during pre-assembly, Erection, Testing and Commissioning works as detailed in the Tender Specification. This shall include all types of handling and Transportation of materials from the site stores / Storage yard to place of erection and any extra work of modification / rectification that may arise during, erection, testing and commissioning works which is incidental to normal erection works.			

SIGNATURE OF THE TENDERER

RATE SCHEDULE

Sl.No	Description of work	Appx. Weight in MT	Unit Rate / MT Rs.	Total Amount Rs.
1	BOILER	4597		
2	ELECTROSTATIC PRECIPITATOR	2024		
3	ROTATING MACHIENS	611		

TOTAL CONTRACT VALUE Rs. ……

In words Rs. ……

SIGNATURE OF THE TENDERER

NOTE FOR RATE SCHEDULE:

1. The Quantities indicated above are approximate and are liable for variation and alteration at the discretion of BHEL. The quoted unit rate shall be applicable for any additional components supplied by BHEL / customer if included at a later date. The work executed shall be measured and priced at unit rate quoted by the contractor and accepted by BHEL.

2. The quantity mentioned in column 3 is approximate and are liable for variation. Payment shall be made to the actual Quantity erected.

3. The Tenderer is expected to fill up the rate column after satisfying all terms and conditions of Tender specification.

4. Tenderers are requested to quote their rates, only in the price bid (part II) provided by BHEL. Quoting of rates in any other form/ formats will not be entertained.

SIGNATURE OF THE TENDERER