TENDER SPECIFICATION

BHEL:PSSR:SCT: 1207

FOR

Handling at site stores/storage yard, transportation to site of work, Erection, Testing and commissioning of Electrostatic precipitator and its auxiliaries, supply and application of final painting for Unit 1 & 2 of 2 X 250 MW set at Neyveli TS II Expansion at Neyveli, Tamil Nadu .

at

Neyveli Thermal Power Station II

Expansion

Unit 2 x 250 MW

Neyveli, Cuddalore Dist. Tamilnadu.

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.

INDEX SCT : 1207

SECTION – I , II, IV & V GCC Separate Booklet

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: 1207

Messrs Date:

Dear Sir,

SUB: Handling at site stores/storage yard, transportation to site of work, Erection, Testing and commissioning of Electrostatic precipitator and its auxiliaries, supply and application of final painting for Unit 1 & 2 of 2 X 250 MW set at Neyveli TS II Expansion at Neyveli, Tamil Nadu .

Please find enclosed one set of non-transferable tender documents containing **-101** - pages along with general conditions of contract Booklet and for the above work.

You are requested to go through the tender documents, GCC Booklet and offer your most competetitive 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 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 8.)

The completed quotations shall reach the office of the under signed on or before **27.12.2006 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

SENIOR DEPUTY GENERAL MANAGER / CONTRACTS

This Tender document is not transferable.

Place : Chennai -35

Encl: One set of Tender documents along with GCC Booklet.

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

SPECIAL INSTRUCTIONS TO BIDDERS

The Bidder must submit their bids as requested in a sealed cover prominently superscribing 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 seven 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 LOI'S, WORK ORDER'S ETC PERTAINING TO THE EXPERIENCE INDICATED IN QUALIFYING REQUIREMENTS, AS GIVEN BELOW.

14. The Purchase preference to CPSE's shall be applicable as per the Central Government guidelines on the date of tender opening.

15. QUALIFICATION REQUIREMENT

a) The bidders should have executed 200 MW or above Boiler or ESP in the last seven years.

b) The bidders should have a minimum average financial turn over of Rs. 150 Lakhs per year in the preceding three years ending 2005-2006.

The Bidder must have earned profit in any one of the last three financial years ending 31.03.2006 and should have positive networth as on 31.03.2006.

Bidder should submit audited balance sheet and profit & loss account of the company for last three years ending 31.03.2006 in support of above requirement.

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

d) Approval of agency by customer.

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

16. A DECLARATION SHEET INDICATING THAT THERE IS NO DEVIATION IN TENDER DOCUMENTS (AS IN PAGE 8) SHALL BE ENCLOSED. 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.

17. 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 government of India undertaking)
Power Sector : Southern Region
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 superscribed as Part I "Technical Bid" and Part II "Price Bid" and also indicating on each of the covers the tender specification number and due date and time as mentioned in the Tender Notice.

Part I (Technical Bid) Cover I

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

Part II (Price Bid) Cover II

All indications of price shall be given in this part II Price Bid.

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 superscribed and submitted to Senior Deputy 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 of either pay order or 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.

Sr. Deputy General Manager/Contracts.

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

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: 1207

Description	EMD
Handling at site stores/storage yard, transportation to site of work, Erection, Testing and commissioning of Electrostatic precipitator and its auxiliaries, supply and application of final painting for Unit 1 & 2 of 2 X 250 MW set at Neyveli TS II Expansion at Neyveli, Tamil Nadu.	Rs 2,00,000/- (Rupees two lakhs only)

Cost of Tender Documents (Including all Taxes)	:	Rs.1105/-	
Sale Starts on	:	07.12.2006	
Sale closes on	:	26.12.2006	
Due date and Time for Submission	:	27.12.2006	15.00 Hrs.
Date and time for opening Of Technical Bids	:	27.12.2006	15.30 Hrs.

QUALIFICATION REQUIREMENT

a) The bidders should have executed 200 MW or above Boiler or ESP in the last seven years.

b) The bidders should have a minimum average financial turn over of Rs.150 Lakhs per year in the preceding three years ending 2005-2006.

The Bidder must have earned profit in any one of the last three financial years ending 31.03.2006 and should have positive net worth as on 31.03.2006.

Bidder should submit audited balance sheet and profit & loss account of the company for last three years ending 31.03.2006 in support of above requirement.

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

d) Approval of agency by customer.

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

Interested parties can get the Tender documents from the office of the Senior Deputy 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.

The 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 ARE LIABLE TO BE SUMMARILY REJECTED.

SENIOR DEPUTY GENERAL MANAGER/CONTRACTS

TENDER SPECIFICATION : BHEL:PSSR:SCT:1207

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

Senior Deputy 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:1207 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/- (Rupees 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/- (Rupees Two lakhs only) mentioned above, to 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

1.	OWNER/PURCHASER	:	Neyveli Lignite Corporation Limited
2.	Consultant	:	TCE Consulting Engineers Limited Sheriff Centre 73/1 St Mark's Road Bangalore - 560001
3.	Project Title	:	2 x 250 MW TS-II Expansion.
4.	Location	:	Neyveli in the state of Tamilnadu in India, located at 200 km from Chennai
5.	Nearest Railway station	:	Neyveli on Vridhachalam-Cuddalore broad gauge link of Southern Railway of India.
6.	Site elevation	:	34.0 to 42.0 m above mean sea level.
7.	Access Road	:	5.0 km from Vridhachalam- Cuddalore road and 15.0 km from Chennai - Tanjore State Highway.
8.	Nearest Airport	:	Chennai
9.	Nearest Sea port	:	Chennai
10.	Latitude of site	:	11 deg 32 minutes and 30 seconds
11	Longitude of site	:	79 deg 26 minutes and 30 seconds
12	Metrological data	:	Weather data of Neyveli from the period 1982 to 2001 indicates the following :

a) **Temperature** :

i) Average Max . Temp : 39.4 deg. C

ii) Average Minimum temp : 18.9 deg. C

iii)	Highest Maximum temp	:	42.8 deg. C
iv)	Lowest Minimum temp	:	15.6 deg. C
v)	Temperature to be considered for design of electrical equipment/devices	:	50 deg C
b)	Relative humidity		
i)	Maximum	:	100%
ii)	Minimum	:	14 %
iii)	Average	:	63 %
c)	Rainfall		
i)	Annual variation	:	676.2 mm to 1856.3 mm
ii)	Average annual RF	:	1203.90 mm
d)	Wind Data		
	Basic wind speed	:	50 m/sec as per IS 875(Parts) - 1987
i)	K_1	:	1.08
ii)	K_2	:	As per terrain Category -3
iii)	K_3	:	1.0

13)	Languages Spoken in the Region	:	English, Tamil
14)	Official language for the bidder to deal with	:	English
15)	Tropicalisation	:	All equipment supplied against this specification shall be given tropical and fungicidal treatment in view of climatic conditions prevailing at site.

16) Cooling water temperature

a)	Design temperature for condenser inlet	:	36^0C
b)	Maximum temperature at condenser inlet	:	41^0C
c)	Design temperature for heat exchanger	:	40^0C

17)	Seismic data	:	As per IS: 1893 - 2002
a)	Zone	:	II
b)	Zone factor-Z	:	0.04
c)	Importance factor (I)	:	1.50

18.0	Auxiliary power supply	:	Auxiliary electrical equipment to be supplied against this specification shall be suitable for operation on the following supply system.
(a)	For motors rated above 160 kW	:	6600V, 3 phase, 3 wire, 50Hz (Medium resistance earthed)
(b)	For motor rated below 160 kW	:	415V, 3 phase, 4 wire solidly earthed AC
(c)	DC. motor starters, DC solenoids, DC alarm, control and protections	:	220 V DC, 2 wire, unearthed DC
(d)	AC control & protective devices	:	110 V, 1 phase, 50Hz, 2 wire AC supply. The single-phase 110V AC supply shall be derived by CONTRACTOR BY PROVIDING 415V/ 110V control transformers of adequate rating with MCCB /MCB on both the primary and secondary sides.

(e)	Uninterrupted power supply	:	110 V, 1 phase, 50Hz, 2 wire AC supply
(f)	AC solenoids, space heaters (for motors rated 30KW and above)	:	240V, 1 phase, 2 wire, 50Hz AC system with effectively earthed neutral. The power supply shall be derived by CONTRACTOR by providing 415V/ 240V transformer of adequate rating with MCCB/MCB on primary/secondary sides.
(g)	Solid state controls (including solenoid valves)	:	24 V DC, 2 wire, supply from (24V DC supply derived from 110 V AC UPS supply)
(h)	Lighting fixtures	:	240 V, 1 phase, 2 wire, 50Hz earthed AC system.
(i)	Lighting fixtures and space heaters in panels	:	240 V, AC 1 phase, 2 wire, 50Hz earthed AC system.

(j) The above voltages may vary as follows :

All devices shall be suitable for continuous operation over the entire range of voltage and frequency indicated below without any change in their performance.

i.	AC supply	:	Voltage variation ±10% Frequency variation ± 5% Combined voltage & frequency variation ± 10%
ii.	DC supply	:	Voltage variation +10% -15%

19.0 WRITEUP ON METEOROLOGICAL DATA FOR NEYVELI

(I) Meteorological Data

The study of the weather data available for the last 20 years for Neyveli (1982 to 2001) indicates the following:

a. **Temperature:**

The monthly average maximum and minimum temperatures have generally a cyclic fluctuation depending on the seasons, with a progressive rise between December and May and a similar from May to December. The average maximum temperature was 39.4 °C. and the average minimum 18.9 °C. The highest recorded temperature was 42.8 °C in April 1985 and May 1989 and the lowest minimum temperature was 15.6 degree C. in February 1989.

b. **Evaporation Rate and Relative Humidity:**

The Evaporation Rate is high during summer months (May) and low in December. During the period the maximum, minimum and annual evaporation rates are 2576.4mm (1982), 1150.6mm(2000) and 1693.3mm respectively. The relative humidity is 14% to 96% during summer and 23% to 100% during winter. The maximum and minimum relative humidity recorded are 100% and 14%.

c. **Wind Velocity**:

The monthly average Wind velocity varies generally from 1.7 to 11.8Km/Hr. The maximum velocity is 118.8 Km/Hr as recorded in December 1993 (04.12.1993). Cyclonic weather is encountered almost every year during monsoon periods.

d. **Rainfall**:

The area gets rainfall both due to southwest monsoon (July - September) and North East monsoon (October - December). The per

day intensity of rainfall due to northeast monsoon is generally higher than that of the southwest monsoon.

The annual rainfall for the period varies from 676.2 mm (1982) to 1856.3 mm (1996) and the average for the period is 1203.9 mm. The total number of rainy days varies from 37 to 67days in a year. Average number of rainy days 56 days per year. 75% of the rainy days are less

than 25mm, 16% of the rainy days are 25mm to 50mm, 8% of the rainy days are 50mm to 100mm and only 1% of the rainy days are above 100mm. The maximum rainfall of 341mm was recorded on 23.12.1983. The precipitation due to South West and North East monsoons is of cyclonic nature and attributable to series of depressions, which develop in the Bay of Bengal and Indian Ocean.

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 services for executing the projects according to most modern and proven techniques and codes. The omission of specific reference to any method and equipment or materials necessary for the proper and efficient services towards installation shall not relieve the contractor of the responsibility of providing such services, / facilities to complete the work or portion of work awarded to him. The quoted rate shall deem to be inclusive of all such contingencies.

3.1.2 The contractor shall carryout the work in accordance with instructions/ drawings / specification(s) / check list / standard practices supplied by BHEL from time to time.

3.1.3 Provisions of all types of labour, supervisors, watch and ward as required, tools and tackles as specified, consumables as specified 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 / testing and commissioning till unit is handed over, as specified In detail in clause 3.10.5

3.2 FACILITIES PROVIDED BY BHEL:

3.2.1 OPEN SPACE:

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

3.2.2 ELECTRICITY:

For construction purpose, and for contractors office and stores shed electricity will be provided free of charge at one single point. Further distribution shall be arranged by the contractor at his cost.

3.2.3 WATER:

Water for construction purpose and drinking also, will be provided at a single point, free of charge as provided by customer to BHEL, Nearer to site. Further distribution shall be arranged by the contractor at their cost.

3.2.4 TOOLS & TACKLES:

All the tools and tackles required for the complete erection, testing and commissioning of components/equipments shall be arranged by the contractor at his cost, except the tools and plants provided by BHEL as indicated in Appendix III.

3.2.5 CONSUMABLES:

All consumables and electrodes including special electrodes if any are to be arranged by the Contractor at his cost. These are governed by clause 3.4 and 3.5 of Tender Specification.

3.3 FACILITIES TO BE PROVIDED AND DEVELOPED BY THE TENDERER AT HIS COST.

3.3.1 CRANES:

The following minimum Tools & Plants shall be arranged by the Contractor with experienced operator, fuel, lubricants etc for execution of this contract within the quoted rate.

S.No	Description	Qty
1	18 T Crawler Crane	1 No
2	8 T Mobile Crane	1 No

Copy of ownership of the above T & P's or the documents with respect to the tie up in the form of a registered agreement with a resourceful party are to be enclosed along with the offer.

3.3.1 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.

3.3.2 WATER DISTRIBUTION:

Distribution of water for construction purposes and as well as drinking purposes to various work-fronts 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 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, 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, and maintain the complete installation on the load side of the supply with due regard to safety requirements at site. It shall be responsibility of the contractor to have atleast (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, hand lamps and area lighting shall be arranged by the contractor at the site of construction, pre assembly yard and contractors material storage area etc. at his cost.

3.3.7 POWER REQUIREMENT:

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, cables etc. shall be dismantled and leveled and debris shall be removed as per instructions 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 the required gases like Oxygen/ Acetylene / 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 reason 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.

3.5 ELECTRODES

3.5.1 All the required electrodes including special electrodes if any like E7018 required 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 Shortage of any of the above electrodes or the equivalent suggested by BHEL shall not be quoted as reason for deficiency in progress or for additional rate.

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

3.5.4 All low hydrogen electrodes shall be baked/dried in the electrode drying oven (range 375 deg. C - 425 deg. C) 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.

3.5.5 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.

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

3.6 TOOLS & TACKLES

3.6.1 BHEL will provide free of hire charges on sharing basis the tools and plants indicated in Appendix III only. 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. Any consumables / Lubricants required for operation and application of the same shall be done by the contractor with his skilled labour at his cost.

3.6.3 Any loss/damage to any or part of the above equipments shall be to contractor's account and the expenditure 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 equipments shall be to 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 utilization 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. (on 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 at his cost.

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

3.6.10 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.

3.6.11 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.

3.6.12 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.

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

3.6.14 All the T & P indicated in Appendix III would be Issued only in 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.

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

3.6.16 The list of major T & P required to be deployed by the contractor is indicated in APPENDIX III. 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

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

3.6.18 During the execution of the work, it becomes 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.

3.6.19 For movement of crane, etc. It may become necessary to lay sleeper bed for obtaining leveled safe approach for usage of equipment It shall be the responsibility of the contractor to lay necessary sleeper's. The required sleepers shall be arranged by the contractor at their cost. BHEL will not provide any sleepers for this work.

3.6.20 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 oil and air filters etc.

3.6.21 BHEL will provide 150 Ton crawler crane 1 No free of charge on sharing basis, for this scope of work. The required operator, Fuel and lubricants will be provided by the contractor.

3.6.22 As the cranes available with BHEL are likely to be deployed for various contractors, the decision of BHEL Engineers will be final with regard to allotment of cranes for day to day use.

3.6.23 The availability of cranes 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.

3.6.24 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 supply all the skilled workmen like welders, gas cutters, electricians, riggers, serangs, erectors, carpenters, fitters, masons, laggers, tin-smiths etc., in addition to other skilled, semi-skilled and unskilled workmen required for all the works of handling and transportation from the site stores to erection site, erection, testing and commissioning contemplated under this specification. Only fully trained and competent men with previous experience on the job shall be employed. They shall also 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 the right to insist on removal of any employee of the contractor at any time, if they find him unsuitable and the contractor shall forthwith remove him.

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 contractor and his personnel shall cooperate 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 confirm 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 contractor 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 the clients of 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 foundation surfaces, enlarging the pockets in foundations etc. as may be required for the erection of equipment, plants shall be carried out by the contractor. All the materials like cement, sand, etc. shall also be arranged by the contractor wherever necessary.

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 including special cement (sand, gravel and 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, including special cement like conbextra or its equivalent are to be provided 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 endeavour to store/stock/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 supervisors/labour force for the above work in sufficient number as may be needed by BHEL for areas covering their scope.

3.9.3 It shall be contractor's responsibility to arrange for necessary crane/tractors, trailers / 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 BHEL site Engineers from time to time.

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 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 as erected and electrodes used shall be submitted to the BHEL Engineer.

3.9.10 The contractor shall follow 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 and the end of each working day. 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. AH 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, scrupulously, 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 unrequired 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.

3.10.0 WELDING

3.10.1 All structural 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 any welders 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.

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 welder 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.

3.10.5 PRESERVATION OF COMPONENTS

It shall be the responsibility of the contractor to apply preservative painting on all equipments 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 rates shall be inclusive of above work. The required paint and thinner shall be supplied by BHEL at free of cost.

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.

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

Due to atmospheric conditions erected materials are likely to get rusted. 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 and thinner shall be supplied by BHEL free of 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.

3.11.0 DRAWINGS AND DOCUMENTS

3.11.1 The detailed drawings specifications available with BHEL Engineer will form part of this tender specification. These documents will be made available to the contractor during execution of work at site.

3.11.2 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. Contractor shall maintain complete records of drawings and documents given to them time to time and maintain the latest drawings / documents in their custody. Contractor shall refrain from defacing the drawing / documents available with them.

3.11.3 The data furnished in various appendices 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.

3.11.4 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.

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

3.12 SAFETY AND CLEANLINESS

3.12.1 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.

3.12.2 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:

SI.No.	Safety measures	Fine (Rs.)
1	Not wearing safety helmet	50/-
2	Not wearing safety belt	100/-
3	Grinding without goggles	50/-
4	Not using 24V supply for internal work	500/-
5	Electrical plugs not used for hand machines	100/-
6	Not slinging properly	200/-
7	Using damaged sling	200/-
8	Lifting cylinders without cage	500/-
9	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/-

3.12.3 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.

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

SPECIFIC REQUIREMENTS FOR ISO 9001 - 2000

3.13.0 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.

3.14.0 INSPECTION / QUALITY ASSURANCE / QUALITY CONTROL STATUTORY INSPECTION

3.14.1 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.

3.14.2 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.

3.14.3 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.

3.14.4 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.

3.14.5 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.

3.14.6 Approval given by Customer/BHEL for welding, test results etc., shall also be recorded in the log book.

3.14.7 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.

3.14.8 Heat Treatment details of 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. Welder's Performance Record shall be furnished every month. The performance Report of Welders shall indicate the percentage of Repair for each welder.

3.14.9 All the Electrical/Technical Measuring and Testing Instruments/Guages, Feeler Guages, Height Guages, Dial Guages, Micrometers, Levels, Spirit Levels, Surface plates, straight Edges, vernier calipers and all measuring Instruments shall be provided by the Contractor for checking, Levelling, 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.

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

3.14.11 The welders performance will be reviewed from time to time as per the BHEL / IBR standards and any welder not performing the standards set by BHEL / IBR standards will be removed from working, Contractor shall arrange for the alternate welders immediately.

3.14.12 All the welders shall carry identity cards as per the proforma preescribed by BHEL. Only Welders duly authorised by BHEL / Boiler Inspector / Consultant shall be engaged on the work.

3.14.13 Contractor shall ensure speedy alignment and welding of all equipment 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, further structural work, Air leak test, trial run of equipment, Pre-commissioning and post commissioning any other tests required to be conducted for completing erection and commissioning.

3.15.0 STAGE INSPECTION BY FES / QA ENGINEERS

3.15.1 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.

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

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

3.15.4 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.

3.16.0 STATUTORY INSPECTION

3.16.1 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, Radiographs, Etc. And following up the matter with them.

3.16.2 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 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 the Contractor's Account. However, BHEL shall pay all other fees (FEES FOR VISITS, INSPECTION FEES, REGISTRATION FEES, ETC.) In case these Inspection have to be Repeated due to Default /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.

HSE SPECIFIC REQUIREMENT

OCCUPATIONAL HEALTH & SAFETY MANAGEMENT SYSTEM

SUB CONTRACTOR TO ENSURE COMPLIANCE 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 continous 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 COMPLIANCE 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 .

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- 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 ELCH's (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 authorise 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 imtes 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 elcetric 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 COMPLIANCE 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 HCE 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 CONDITIONS

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, loading and transporting of materials from project stores sheds / storage yards to site of erection or preassembly yard and unloading at pre-assembly area/erection site, checking, cleaning chipping and leveling of foundations, providing packers and shims/pre-assembling of equipments at the pre-assembly yard, inspection, minor rectification, touch up painting , erection, leveling, alignment, and other adjustments, cutting, edge/surface preparation, welding, grinding, RT/LPI/MPI testing wherever needed, heat treatment, carrying out air tightness test by soap solution / kerosene (with air blower arrangement), pre-commissioning, commissioning, testing and trial run of the ESP and connected auxiliaries, I D System ducting with structures supply and application of final painting covered under the tender specifications and providing assistance during commissioning and unit trial operations at 2X250 MW Neyveli TS II Expansion Project on Unit 1 &2 .

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

6.2 FOUNDATION DRESSING AND GROUTING

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 30mm 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 foundation.

6.2.3 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 required materials like sand, gravel, cement etc and cleaning consumables shall be arranged by the contractor at his cost.

6.2.4 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 the base plates of structural columns to the satisfaction of BHEL Engineer.

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 materials required for grouting like conbextra GPI, or its equivalent, such as ACC – Shrinkkomp – N20 Sika Anckor, NSG/NSG – 1 and CICO Excem GP and other materials like Portland cement, sand etc., are to be arranged by the contractor at his cost.

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

6.3 SCOPE OF ERECTION

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

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, 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 shall be carried out by the contractor as part of the work and at his quoted rates.

6.3.5 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 pre-fabricated clamping type ladders. No temporary welding on any structural member is permitted except under special circumstances with the approval of BHEL.

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

6.3.7 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

6.3.8 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.

6.3.9 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.

6.3.10 Suspension for ducting will be supplied in running lengths which shall be cut to size and adjusted as required. Ducts / expansion bellows are dispatched to site in loose 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 members, which are essential will have to be carried out by the contractor without any extra payment.

6.3.11 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 to 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.

6.3.12 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/prepared the edges to suit the matching profile weld/bolt connect the joints at no extra cost.

6.3.13 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.

6.3.14 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.

6.3.15 The contractor shall take all reasonable care to protect the materials and equipment during erection. Preservative 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 to BHEL.

6.3.16 Paints for preservative painting & thinner required for preservation shall be supplied by BHEL **free of cost.** All other consumables like wire brush, emery sheets etc. shall be arranged by the contractor at his cost.

6.3.17 Attachment, welding of necessary instrumentation tapping points, both for regular measurements and performance testing to be provided on E.S.P / its auxiliaries or pipelines covered within the scope of this tender will also be the responsibility of the contractor and the same will be done as per the instruction of BHEL Engineer.

6.3.18 Spring suspensions / constant load hangers have to be pre-assembled 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.

6.3.19 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.

6.3.20 Contractor shall carryout necessary touch up painting PERIODIC application of preservation on all components and other equipment during erection / after erection until completion of work. Necessary preservations / paints thinner will be provided by BHEL free of cost.

6.3.21 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.

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

6.3.23 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.

6.3.24 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.

6.3.25 Certain extra lengths of various plates/ducts/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 rewelding, addition spool pieces should be done by the contractor to match site conditions without any extra payment.

6.3.26 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 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 housekeeping is certified as satisfactory by the customer.

6.3.27 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.

6.3.28 The contractor is strictly prohibited in using any of the E.S.P 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.

6.3.29 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.

6.3.30 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.

6.3.31 ROOF INSULATION

One layer of insulation mattress on roof top of E.S.P 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 group and the erected materials shall be paid at the accepted tonnage rate for ESP.

6.3.32 WELDING, HEAT TREATMENT & RADIOGRAPHY

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 certificates. BHEL reserves the right to reject any welder without assigning any reasons. 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, re-testing of the welders as demanded by BHEL.

6.3.33 All welded joints shall be subjected to acceptance by BHEL Engineer and all the welded joints shall be subjected to Non destructive testing as per the drawings/standards/procedures and as per the site requirement. Contractor's quoted rate shall be inclusive of the same.

6.4.0 TESTING, PRE-COMMISSIONING, COMMISSIONING & POST COMMISSIONING

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

6.4.1 The contractor shall carry out all the required tests on the equipments erected such as gas tightness test for ducts by kerosene, clean air flow test, etc., using contractor's own consumables, labour and scaffoldings. Necessary smoke bombs will be provided by BHEL.

6.4.2 All the above 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.

6.4.3 For conducting gas tightness test, it may be required to erect the blowers and connecting ducts and commission the same for tightness test. It is the responsibility of the contractor to erect the blowers & dismantle once the test is over. Contractor shall carry out the work with in the quoted rate and BHEL will provide only the required materials.

6.4.4 Fixing dummy plates at required locations for conducting tightness test and normalising after the completion tests, is also covered in the scope of contract and shall be carried out with in the quoted rate.

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

6.4.6 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.

6.4.7 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.

6.4.8 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.

6.4.9 The commissioning activities will continue up to handing over of the units. It shall be the responsibility of the contractor to provide following category of workers in sufficient numbers along with supervisors including necessary equipment, consumables, hand tools, etc. during this period. The rate quoted shall include all these contingencies also.

a. Fitters
b. Structural Welders
c. Riggers
d. Unskilled workers
e. Electricians
f. Any other category of workers as may be required.
g. Supervisor

Further in addition to the above contractor has to arrange the following manpower exclusively for assisting BHEL commissioning engineers during stabilization and trial operation period. These manpower will be directly controlled by BHEL commissioning engineers only.

1. One Electrician per shift for three shifts

2. One helper per shift for three shifts.

6.4.10 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.

6.4.11 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.

6.4.12 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 or at the rates to be settled at that time. 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.

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

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

6.4.15 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.

6.4.16 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 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. Lubricants will however be supplied free of cost of BHEL.

6.4.17 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.

6.4.18 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.

6.5.0 PROGRESS OF WORK

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 workman like fitters, operators, technicians, etc., employed are not sufficient, BHEL will induct required additional workmen to improve the progress and recover from the contractors bills, all charges incurred on this account including all expenses together with BHEL overheads.

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

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.

The contractor shall arrange for weekly progress review meetings with engineer at site during which actual progress during the week vis-a-vis scheduled programme shall be discussed for action to be taken for achieving targets. The programme for subsequent week shall also be presented by 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 submit detailed monthly plan after discussion with BHEL Engineer and the same has to be forwarded by the first week of the month (working month or calendar month).

6.6.0 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. Payment to the contractor will be linked with the submission of these FQA log sheets.

6.7.0 SCOPE OF WORK FINAL PAINTING

6.7.1 The scope of work shall also include supply and application of final painting as required and specified for the components of ESP and its auxiliaries.

6.7.2 The scope of work includes supply and application of paints as per the approved colour code for the components of ESP and its auxiliaries

6.7.3 All exposed metal parts of equipments including structures handling etc. Wherever applicable after installation unless otherwise surface protected, be first cleaned for dust, rust, scales, grease, oil and other foreign materials by wire brushing, scrapping and chemical cleaning the same being inspected and approved by BHEL / Customer engineers for painting. Afterwards the above parts shall be painted as per the instruction of BHEL /Customer official and as per painting specification enclosed. Before applying the subsequent coats, the thickness of each 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.

6.7.4 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.

6.7.5 The actual colour to be applied is indicated in the enclosed painting specification. The scope of painting includes application of colour bands, lettering the names of the systems, equipment, tag nos of

valves, marketing the directions of flow and other data required by Customer / BHEL within the quoted rates at the appropriate place as identified by BHEL / Customer.

6.7.6 Number of finish coats shall be as indicated in the painting specification enclosed in this tender. The painting specification which is forming part of this tender as enclosed shall be strictly followed.

6.8.0 TIME SCHEDULE.

6.8.1 The contractor shall have to mobilise in all respects within two weeks from the date of issue of Fax Letter of Intent to commence the work.

6.8.2 The entire work of erection, testing and commissioning of Unit – 1 & 2 as detailed in the Tender Specification shall be completed within **Twenty two (22)** months from the date of commencement of work at site. The work of Unit I shall be completed in twenty months and work on Unit II by twenty second month. Any advancement required completing the project in the course of execution, contractor shall carry out the work with out any extra cost.

6.8.3 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.

6.8.4 The work under this scope of contract is deemed to be completed in all respects only when all the testing and commissioning of all the equipments are completed. The decision of BHEL in this respect shall be final and binding with contractor.

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

6.9 PAYMENTS FOR WORK COMPLETED

6.9.1 The Tenderer shall quote separate rates as per the Rate schedule appended. The contractor shall submit his running bills once in a month at the end of each month.

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

6.9.3 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.

6.9.4 PAYMENT TERMS

6.9.4.1 **For PG 39 & 89**

i) **20%** of the contract rate on pro-rata basis on checking of wherever pre-assembly is involved

ii) **20%** of the contract rate on pro-rata basis after erection and alignment.

Or

iii) **40%** of the contract rate on pro-rata basis after erection and alignment.

iv) **40%** of the contract rate on pro-rata basis on completion of welding, fastening, grouting supports if any.

v) **5%** of the contract rate on prorata basis on completion of PGMA, Hand Rails and Toe Guard Plates as applicable.

vi) **3 %** on submission of all protocols of respective areas duly certified by all concerned.

6.9.4.**2 For PG 48 : DUCTS (PART)**

i) **30%** of the contract rate on prorata basis on completion of pre-assembly

ii) **30%** of the contract rate on prorata basis on erection, alignment and completion of welding.

iii) **20%** of the contract rate on prorata basis will be paid on completion of supports in all respects in the respective zones.

iv) **5%** of the contract rate on prorata basis on completion of manhole doors, instrumentation tapping points, performance test points.

v) **3 %** on submission of all protocols of respective areas duly certified by all concerned.

6.9.4.3 **PG 78**

i) **20%** of the contract rate on prorata basis on completion of Pre Assembly wherever applicable

ii) **20%** of the contract rate on prorata basis on completion erection alignment for the items wherever pre-assembly is involved

OR

iii) **40%** of the contract rate on prorata basis on completion of erection, alignment for the items wherever pre-assembly is not involved.

iv) **30%** payment of contract on prorata basis on completion of fastening, welding, grouting along with supports etc.

v) **5%** of the contract on prorata basis (for the erected tonnage) will be paid after completion of Hopper Upper part middle and lower parts inspection doors, heating elements, poking doors etc.,

vi) **5%** of the contract on prorata basis (for the erected tonnage) will be released after completion of inner roof , outer roof, insulator, housing, rectifier transformer, pent house and their connected works in the roof, like mono rails and hoist etc.

vii) **5%** of the contract prorata basis (for the erected tonnage) will be released after completion of Gas Distribution path and completion of rapping mechanism with the drives in all respects.

viii) **3 %** on submission of all protocols of respective areas duly certified by all concerned.

6.9.4.5 Further 12% applicable for PGs covered under the scope of contract shall be released as detailed below:

i) **1%** of the contract value for the erected tonnage after completion of air and gas leak test.

ii) **1%** of contract value for the erected tonnage after cutting and removal of scraps, temporary supports and return to stores, painting and clearing for insulation.

iii) **2%** of the Contract value for the erected tonnage will be paid after completion of final painting.

iv) **2%** of the Contract value for the erected tonnage will be paid on charging of all the ESP fields.

v) **1%** of the Contract value for the erected tonnage will be paid on completion of Gas Distribution test.

The balance amount of **5%** will be paid after the guarantee period of 12 months is over. The guarantee period shall commence from the date of handing over of the set to the customer. However the above 5% payment can be released against submission of a matching Bank guarantee from a Nationalised / scheduled Bank in the prescribed Performa of BHEL valid for one year.

CONTRACTOR SHALL NOTE THAT THE FINAL BILL BE RELEASED ONLY ON PRODUCTION OF A CERTIFICATE ISSUED BY SITE IN CHARGE THAT THE CONTRACTOR HAS FULFILLED ALL THE CONTRACTUAL / STATUTORY REQUIREMENT.

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

6.10.1 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.

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

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

6.10.4 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.

6.10.5 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.

6.11.0 EXTRA WORK DOES NOT INCLUDE

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

6.12.0 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.

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

6.13.0 OVER RUN CHARGES

6.13.1 Incase due to reasons not attributable to the contractor, the work gets delayed and completion time gets extended beyond **Twenty two (22) months** from the date of commencement of the work, the contractor shall not be entitled for any over run compensation (ORC) for a period of first **Three (3) months** after the expiry of **Twenty two (22) months .** Incase of ORC arise the same will apply at **Rs.30,000/- (Rupees Thirty Thousand only)** per month for extension to the completion period beyond **25 (22+3)** months as stated above duly taking into account the balance work at the end of that period.

6.13.2 The period of overrun will have to be ascertained before the commencement of grace period.

6.13.3 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.

6.14.0 PRICE ESCALATION

6.14.1 The quoted / accepted rate has to be kept **firm** for the entire contractual period including total extended period if any and no claim for revision of rates is allowed under any circumstances.

6.14.2 However the contractor shall maintain sufficient work force and other resources required for completion of the job expeditiously for the entire contractual period including total extended period.

6.15.0 TAXES

6.15.1 Not withstanding the fact that this is only an erection service contract not involving any transfer of materials whatsoever and not attracting any sales tax liability, being labour oriented job work, for the purpose of Sales Tax 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., interalia indicating the name of the supplier, address and ST Registration No. and ST paid and should furnish to BHEL at the year end.

6.15.2 The contractor has to register under local Sales Tax-Law and get assessed. The contractor has to give a certificate each year that the returns and submitted regularly and the turnover on this contract is included in his sales tax return. The sales tax registration number and certificate is to be furnished at site soon after the award of contract. However in case delay is anticipated in obtaining S.T. Regn.No. a copy of application for registration filed with ST authorities shall be submitted along with first running bills and the ST Regn.No. will be submitted within a reasonable time.

6.15.3 The final bill amount would be paid only after submission of proof of inclusion of the turnover of this contract in the ST Returns or ST Clearance certificate. The ST deduction at source will be made from running bills, unless necessary exemption is produced.

6.15.4 IMPORTANT CONDITIONS FOR PAYMENT

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

i. PF Regn. No.

ii. Labour Licence No.

iii. Workmen Insurance Policy No.

iv. Un Qualified Acceptance for Detuiled L.O.I.

v. Initial 50% Security Deposit.

vi. Rs. 100/- Stamp Paper for Preparation of contract agreement

6.16.0 PROVIDENT FUND & MINIMUM WAGES

6.16.1 Your are required to extend 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.

6.16.2 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.

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

6.17.0 SALES TAX

Service Tax as applicable for this Contract will be paid by BHEL.

The contractor may claim the Service Tax in their R.A.bill and the same will be paid by BHEL, on production of copy of registration certificate. Proof of remittance of service tax by the contractor to the service tax authorities, relating to previous RA bill, has to be produced from the second running bill onwards.

6.17.1 TAXES, DUTIES, LEVIES

Refer to clause 2.8.4 of general conditions of contract in this regard.

New Levies / Taxes

In case the government imposes any new levy / Tax after award of the work, BHEL shall reimburse the same at actuals on submission of documentary proof of payment subject to the satisfaction of BHEL that such new levy / Tax is applicable to this contract. No reimbursement on account of increase in the rate of existing levies shall be made.

16.18.0 OTHER STATUTORY REQUIREMENTS

16.18.1 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.

16.18.2 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.

16.18.3 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.

16.18.4 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.

16.18.5 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.

16.18.6 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.

16.19.0 Specification for Computers

The contractor should arrange their own PC system as per the following specification with qualified operators at their cost. It is the responsibility of the contractor for the operation and the maintenance of the system, and if any fault / failure of the system should be rectified immediately without delay, at contractors cost. Contractor has to note the above aspects and quote accordingly.

Specification for PC system

(To be Arranged by the Contractor at their Cost)

Sl.No	Features	Minimum Requirements
1	Processor	Intel Pentium IV , 2 GHz or above
2	Chipset	Intel 845 or higher Intel Chipset
3	RAM	256 MB DDR / SDRAM
4	HDD	40 GB
5	FDD	1.44 MB
6	Optical Drive	48 x of above CDD
7	Monitor	15" VGA Colour
8	Keyboard	Minimum 104 keys Windows keyboard
9	Mouse	2 Button Scroll mouse
10	Ethernet	Integrated 10/100 Mbps NIC for LAN
11	Ports	Minimum 1 Parallel, 1 Serial, 2 USB
12	Software	Windows 2000 or XP Professional
13	Accessories	Mouse pad & Dustcovers
14	UPS	1 KVA UPS with 1 hr. backup
15	Printer	A4 size Laser Printer – 20 ppm or above (with all consumables, cartridges & stationery

SCOPE AT A GLANCE
SECTION VII – APPENDIX I
SITE FACILITIES

PROJECT : Neyveli Thermal Power Station Expansion 2 x 250 MW

Sl.No	Description PART I	Scope / to be taken care by		Remarks
		BHEL	Bidder	
1.1.0	ESTABLISHMENT			
1.1.1	FOR CONSTRUCTION PURPOSE:			
A	Open space for office	Yes	-	
B	Open space for storage	Yes	-	
C	Construction of bidder's office, canteen and storage building including supply of materials and other services		Yes	
D	Bidder's all office equipments, office / store / canteen consumables		Yes	
E	Canteen facilities for the bidder's staff, supervisors and engineers etc		Yes	
F	Fire fighting equipments like buckets, extinguishers etc		Yes	
G	Fencing of storage area, office, canteen etc of the bidder		Yes	
1.1.2	**FOR LIVING PURPOSES OF THE BIDDER**			
A	Open space		Yes	
B	Living accommodation		Yes	
1.2.0	**ELECTRICITY**			
1.2.1	Electricity For construction purposes **(to be specified whether chargeable or free)**			
1.2.1.1	Single point source	Yes		
1.2.1.2	Further distribution for the work to be done which include supply of materials and execution		Yes	
1.2.2	Electricity for the office, stores, canteen etc of the bidder which include:		Yes	
1.2.2.1	Distribution from single point including supply of matreials and service		Yes	

Sl.No	Description PART I	Scope / to be taken care by		Remarks
		BHEL	Bidder	
1.2.2.2	Supply, installation and connection of material of energy meter including operation and maintenance		Yes	
1.2.2.3	Duties and deposits including statutory clearances for the above		Yes	
1.2.2.4	Living facilities for office use including charges		Yes	
1.2.2.5	Demobilization of the facilities after completion of works		Yes	
1.2.3	Electricity for living accommodation of the bidder's staff, engineers, supervisors etc on the above lines.(**in case BHEL provides this facility, the scope should be given without ambiguity)**		Yes	
1.3.0	**WATER SUPPLY**			
1.3.1	**For construction purposes:**			
1.3.1.1	Making the water available at single point	Yes		
1.3.1.2	Further distribution as per the requirement of work including supply of materials and execution		Yes	
1.3.2	**Water supply for bidder's office, stores , canteen etc**			
1.3.2.1	Making the water available at single point	Yes		
1.3.2.2	Further distribution as per the requirement of work including supply of materials and execution		Yes	
1.4.0	**TRANSPORTATION**			
1.4.1	For construction purposes:			
1.4.1.1	For the site personnel of the bidder		Yes	
1.4.1.2	For the bidder's eqbuipments and consumables (T&P, consumables etc)		Yes	

Sl.No	Description PART I	Scope / to be taken care by		Remarks
		BHEL	Bidder	
1.5.0	**LIGHTING**			
1.5.1	For construction work (supply of all the necessary materials) 1. At office storage area 2. At the preassembly area 3. At the construction site /area		Yes	
1.5.2	For construction work (execution of the lighting work/ arrangements) 1. At office storage area 2. At the preassembly area 3 At the construction site /area		Yes	
1.5.3	Providing the necessary consumables like bulbs, switches, etc during the course of construction		Yes	
1.5.4	Lighting for the living purposes of the bidder at the colony / quarters		Yes	
1.6.0	**COMMUNICATION FACILITIES FOR SITE OPERATIONS OF THE BIDDER**			
1.6.1	Telephone, fax, internet, intranet, e-mail etc		Yes	
1.7.0	**COMPRESSED AIR SUPPLY**			
1.7.1	Supply of Compressor and all other equipments required for compressor and compressed air system including pipes, valves, storage systems etc		Yes	
1.7.2	Installation of the above system and operation and maintenance of the same .		Yes	
1.7.3	Supply of the all the consumables for the above system during the contract period		Yes	

SCOPE AT A GLANCE
SECTION VII – APPENDIX I
SITE FACILITIES

PROJECT : Neyveli Thermal Power Station Expansion 2 x 250 MW

Sl.No	Description PART I	Scope / to be taken care by		Remarks
		BHEL	Bidder	
2.1.0	Engineering works for construction :			
2.1.1	Providing the erection drawings for all the equipments covered under this scope	Yes		
2.1.2	Drawings for construction methods		Yes	In consultation with BHEL
2.1.3	As-built drawings – where ever deviations observed and executed and also based on the decisions taken at site- example – routing of small bore pipes		Yes	″
2.1.4	Shipping lists etc for reference and planning the activities	Yes	Yes	″
2.1.5	Preparation of site erection schedules and other input requirements		Yes	″
2.1.6	Review of performance and revision of site erection schedules in order to achieve the end dates and other commitments		Yes	″
2.1.7	Weekly erection schedules based on Sl No 2.1.5		Yes	″
2.1.8	Daily erection / work plan based on Sl No 2.1.7		Yes	″
2.1.9	Periodic visit of the senior official of the bidder to site to review the progress so that works are completed as per schedule. It is suggested this review by the senior official of the bidder should be done once in every two months.		Yes	
2.1.10	Preparation of preassembly bay		Yes	

Sl.No	Description PART I	Scope / to be taken care by		Remarks
		BHEL	Bidder	
2.1.11	Laying of racks for gantry crane if provided by BHEL or brought by the contractor/bidder himself		Yes	
2.1.12	Arranging the materials required for preassembly		Yes	
2.2.0	SUGGESTED LIST OF TOOLS AND PLANTS (BHEL should indicate the proposed number of items considered as free issue)			
2.2.1	250 T crawler crane FMC with HLA (1)			
2.2.2	250 T tyre mounted crane			
2.2.3	150 T crawler crane			
2.2.4	150T tyre mounted crane			
2.2.5	150 T crawler crane One No	Yes		* Provided with operator free of charge.
2.2.6	100T tyre mounted crane		AS PER SCOPE OF WORK	
2.2.7	75 T crawler crane One No	Yes		
2.2.8	75 T tyre mounted crane			
2.2.9	60T Kroll tower ctane			
2.2.10	18 T crawler crane One No.	Yes		
2.2.11	18/20 T tyre mounted crane one			
2.2.11 A	8T Escort crane One No.			
2.2.12	30T gantry crane			
2.2.13	15 T gantry crane			
2.2.14	10T gantry crane			
2.2.15	30T tractor trailor			
2.2.16	20T trailor			
2.2.17	10 T trailor / truck			
2.2.18	Electrical winches 15 T with / wire ropes Drum lifting (2 Nos)			
2.2.19	Electrical winches 10T with / without wire ropes			
2.2.20	Electrical winches 5 T with / without wire ropes			

Sl.No	Description PART I	Scope / to be taken care by		Remarks
		BHEL	Bidder	
2.2.21	Electrical winch 3 T with or without wire rope			
2.2.22	Electrical winches with/without wire ropes			
2.2.23	Pneumatic winches 1 T with / without wire rope			
2.2.24	Welding generators			
2.2.25	Welding rectifiers			
2.2.26	Welding transformersair cooled			
2.2.27	Welding transformers oil cooled			
2.2.28	Chain pulley block 10T		TO BE ARRANGED BY THE BIDDER AS PER SCOPE OF WORK	
2.2.29	Chain pulley block 5 T			
2.2.30	Chain pulley block 3T			
2.2.31	Chain pulley block 1T /2T			
2.2.32	Pulling & lifting machines 5T			
2.2.33	Pulling & lifting machine 3T			
2.2.34	Pulling and lifting machine 2T / 1T			
2.2.35	Multi sheave pulley block 200 T (4) Drum Lifting			
2.2.36	Multi sheave pulley block 100 T			
2.2.37	Multi sheave pulley block 50T			
2.2.38	Multi sheave pulley block 30T			
2.2.39	Multi sheave pulley block 20T			
2.2.40	Multi sheave pulley block 5T			
2.2.41	Single sheave shackle pulley blocks 20T			
2.2.42	Single sheave shackle pulley block 10T			
2.2.43	Single sheave shackle pulley block 5 T			

Sl.No	Description PART I	Scope / to be taken care by		Remarks
		BHEL	Bidder	
2.2.44	25 V transformer with sufficient spare bulbs			
2.2.45	Gas cutting torches with regulators			
2.2.46	Torque wrench			
2.2.47	Pipe vice			
2.2.48	Bench vice			
2.2.49	Anvil			
2.2.50	Baking oven for welding electrodes			
2.2.51	Portable drying oven for baked welding electrodes			
2.2.52	GQA grinding machine		TO BE ARRANGED BY THE BIDDER AS PER SCOPE OF WORK	
2.2.53	FF2 grinding machine			
2.2.54	Angle grinders AG7			
2.2.55	Tig welding sets			
2.2.56	Air conditioners 1.5 T			
2.2.57	Sheet bending machine			
2.2.58	Sheet rolling m/c			
2.2.59	Sheet grooving m/c			
2.2.60	Pedestal drilling m/c			
2.2.61	Drilling m/c 31 mm			
2.2.62	Drilling m/c 20mm			
2.2.63	Drilling m/c 10 mm			
2.2.64	Hand drilling m/c 6 mm			
2.2.65	D shackles 30 T			
2.2.66	D shackles 20T			
2.2.67	D shackles 15 T Drum lifting			

Sl.No	Description PART I	Scope / to be taken care by		Remarks
		BHEL	Bidder	
2.2.68	D shackles 10T		TO BE ARRANGED BY THE BIDDER AS PER SCOPE OF WORK	
2.2.69	D shackles 5T/3T			
2.2.70	Wire rope sling 6x36 12mmx6m			
2.2.71	Wire rope slings 12mmx10m			
2.2.72	Wire rope slings 16mmx4m			
2.2.73	Wire rope slings 16mmx6m			
2.2.74	Wire rope slings 16mmx10m			
2.2.75	Wire rope sling 19mmx15 m			
2.2.76	Loose wire rope 16mm			
2.2.77	Loose wire rope 19 mm			
2.2.78	Loose wire rope 25mm			
2.2.79	Loose wire rope 32mm			
2.2.80	Wire rope clamps for the above sizes sufficient quantity			
2.2.81	Manila ropes of sufficient quantity in different sizes			
2.2.82	Hydraulic jacks 250/200T			
2.2.83	Hydraulic jacks 100T			
2.2.84	Hydraulic jacks 50T			
2.2.85	Hydraulic jacks 25 T			
2.2.86	Hydraulic jacks 10T			
2.2.87	Tower crane 50T			
2.2.88	Derricks 30T with 70 M high with all necessary accessories 2 nos			

Sl.No	Description PART I	Scope / to be taken care by		Remarks
		BHEL	Bidder	
2.2.89	EOT cranes in TG hall ♦ Main hook ♦ Aux hook			
2.2.90	Sleepers both wooden and concrete for movement of cranes at site			
2.2.91	Concrete blocks for pre assembly works at site			
2.2.92	15 T snatch pulley blocks Drum lifting			
2.2.93	Hydro test pump 600 bar / 400 bar (One No)			
2.2.94	Hydro test pump 250 bar			
2.2.95	Hand operated hdro test pump			
2.2.96	Boiler filling pump 100m head with ~ 15 LPSec			
2.2.97	Pressure gauges 400 bar			
2.2.98	Pressure gauges 600 bar		TO BE ARRANGED BY THE BIDDER AS PER SCOPE OF WORK	
2.2.99	Pressure gauges 100 bar			
2.2.100	Acid cleaning pumps with all accessories including switch gears			
2.2.101	Stress relieving / preheating equipments including transformers, controllers, heating pads and insulating materials and consumables			
2.2.102	Hydrauli pipe bending machines to suit up to 80mm dia and 11 mm thick			
2.2.102 a	Blowers – Two Nos	Yes		
2.2.102 b	Huck Bolting Machine - 1 No.	Yes		

Sl.No	Description PART I	Scope / to be taken care by		Remarks
		BHEL	Bidder	
2.2.103	Electric driven pipe chamfering machines up to 100 mm dia tubes with necessary cutting tools and other consumables			
2.2.104	Electric driven pipe chamfering m/c to suit pipes from dia 100 mm to 500/600 mm			
2.2.105	Theodolite 1 min accuracy			
2.2.106	Dumpy level			
2.2.107	6 point temp. recorder			
2.2.108	Radiographic equipments with suitable isotopes/ x ray machines			
2.2.109	MPI test kit			
2.2.110	Ultrasonic flaw detector			
2.2.111	Dye penetrant test kits (as required)			
2.2.112	Moving platforms Sky Claimber			
2.2.113	Passenger cum goods lift			
2.2.114	Dip lorries			
2.2.115	Rails and sleepers for dip lorries, both supply and installation		TO BE ARRANGED BY THE BIDDER AS PER SCOPE OF WORK	
2.2.116	Calibrated steel tapes of different sizes			
2.2.117	Plumb bobs			
2.2.118	Micro meters of different sizes both inside and out side			
2.2.119	Vernier calipers of different sizes			
2.2.120	Surface plate			

Sl.No	Description PART I	Scope / to be taken care by		Remarks
		BHEL	Bidder	
2.2.121	Straight edges of different lengths			
2.2.122	Feeler gauges of different lengths			
2.2.123	Inside and out side calipers			
2.2.124	Bolt heating equipments including thermo couples			
2.2.125	Dial gauges with magnetic base			
2.2.126	Magnifying glass			
2.2.127	Piano wires			
2.2.128	Precision water level micrometer			
2.2.129	Parallel blocks			
2.2.130	Taper wedges			
2.2.131	Micro jacks			
2.2.132	Lead wires			
2.2.133	Dial bore micro meter			
2.2.134	Thermo meters of different ranges			
2.2.135	Depth gauges			
2.2.136	"GO & "NO GO" gauges			
2.2.137	Drill sets			
2.2.138	Taps and die sets		TO BE ARRANGED BY THE BIDDER AS PER SCOPE OF WORK	
2.2.139	Spirit levels			
2.2.140	Master spirit level			
2.2.141	Spring balance			
2.2.142	Hg manometer			
2.2.143	Vibro meter			
2.2.144	Noise level meter			

Sl.No	Description PART I	Scope / to be taken care by		Remarks
		BHEL	Bidder	
2.2.145	Litmus paper			
2.2.146	Portable gas purity meter			
2.2.147	Dead weight tester			
2.2.148	Temp bath for calibration			
2.2.149	250V/500V megger			
2.2.150	½.5/5.0 KV motorised megger			
2.2.151	Ammeter and voltmeters			
2.2.152	HV test kit			
2.2.153	Double Kelvin Bridge			
2.2.154	DC bridge			
2.2.155	Mano meters			
2.2.156	Auto transformers			
2.2.157	CT(100/5A)			
2.2.158	Purge test kits			
2.2.159	Multi meters			
2.2.160	Variac 3phase 10 A			
2.2.161	Phase sequence meter			
2.2.162	Dual beam osciiloscope continuity tester			
2.2.163	Rheostats			
2.2.164	Milli seconds syn timer			
2.2.165	Ultra violet recorder			
2.2.166	Tong tester		TO BE ARRANGED BY THE BIDDER AS PER SCOPE OF WORK	
2.2.167	Hardness tester			
2.2.168	Bolt stretching device			
2.2.169	Reamers of various sizes			
2.2.170	Vacuam cleaner			

Sl.No	Description PART I	Scope / to be taken care by		Remarks
		BHEL	Bidder	
2.2.171	Sand blasting machine with accessories			
2.2.172	Spray painting equipments			
2.2.173	Oil filtration units			
2.2.174	Bearing pullers of different sizes			
2.2.175	Bearing scrappers			
2.2.176	Slip gauges			
2.2.177	Elko meter to measure paint thickness			
2.2.178	MIG welding machines			
2.2.179	Files of different sizes			
2.2.180	Socket wrenches			
2.2.181	Spanner and pipe wrenches sets			
2.2.182	Hammers of different sizes both soft and hard			
2.2.183	Allen keys sets			
2.2.184	Fire proof tarpaulins			
2.2.185	Steel scaffolding materials			
2.2.186	Pipe cutters			
2.2.187	Magnetic base for drilling machines			
2.2.188	Vibrator for grouting			
2.2.189	Mixing machine for grouting and concreting			
2.2.190	Tube expanding machine ie drives – hydraulic or pneumatic ( )			
2.2.191	Tube expanders – both for expansion and flaring			
2.2.192	Mercury plumb bob			
2.2.193	Band saw machines		Yes	
2.2.194	Copper rods		Yes	
2.2.195	Needle vibrators		Yes	

Sl.No	Description PART I	Scope / to be taken care by		Remarks
		BHEL	Bidder	
2.3.0	All consumables including :		Yes	
	Ordinary cement		Yes	
	Grouting cement		Yes	
	Any special cement		Yes	
	Sand, bricks etc		Yes	
	Tig wires		Yes	
	Electrodes		Yes	
	Brazing rod, flux etc		Yes	
	Soldering		Yes	
	DA, oxygen, argon		Yes	
	Nitrogen required for chemical cleaning		Yes	
	Nitrogen required for construction		Yes	
	Paints along with thinner, brushes, cleaning materials etc for preservation of components		Yes	
	Paints including thinner, brushes, cleaning materials etc for final painting , as per specifications		Yes	
2.4.0	WELDING		Yes	
2.4.1	All welding works		Yes	
2.4.2	All radiography and other testing works like DPI, MPI, UT,		Yes	
2.4.3	All connected works like preheating, post heating, stress relieving,		Yes	
2.4.4	Providing certified either IBR or as per other relevant welders for the works. BHEL will not provide materials, test certificates etc for the above purpose unless specifically stated .		Yes	
2.4.5	To submit the welders to BHEL/client's approval (preproduction test) before putting them on regular work. Required materials for preproduction test to be arranged by BHEL.		Yes	
2.4.6	The accessories required for the welders to be arranged by the bidder		Yes	

Sl.No	Description PART I	Scope / to be taken care by		Remarks
		BHEL	Bidder	
2.5.0	CHEMICAL CLEANING			
2.5.1	Supply of pumps, motor, starters, cables, piping and other materials required for the operation		As per scope of work	
2.5.2	Servicing the required equipments and commissioning			
2.5.3	Chemicals required for the operation including Nitrogen gas			
2.5.4	Handling equipments / consumables for the chemical cleaning works			
2.5.5	Effluent disposal system			
2.5.6	Services for the effluent disposal			

Note : * All the tools and plants required for this scope of work, except the Tools & Plants provided by BHEL are to be arranged by the contractor within the quoted rates. The list is suggestive in nature. Any additional T & P required to be arranged by the contractor.

SCOPE AT A GLANCE
SECTION VII – APPENDIX I
SITE FACILITIES

PROJECT : Neyveli Thermal Power Station Expansion 2 x 250 MW

Sl.No	Description PART III ERECTION TESTING & COMMISSIONING	Scope / to be taken care by		Remarks
		BHEL	Bidder	
3.1.0	**SCOPE OF WORK**		Yes	
3.1.0.1	Handling at site stores/ storage yard		Yes	
3.1.0.2	Transportation within the site		Yes	
3.1.0.3	Erection testing & commissioning		Yes	
3.1.0.4	Final painting of erected materials including supply of paints, thinners etc		Yes	
3.1.0.5	Carrying out P.G.test	Yes		
3.1.1.0	HANDLING & TRANSPORTATION		Yes	
3.1.1.1	Stores/storage yard to preassy area/ erection site		Yes	
3.1.1.2	Pre assembly area to site of installation		Yes	
3.1.1.3	Erection site to pre assembly area / stores/ storage area if required		Yes	
3.1.1.4	Touch up painting wherever required till final painting.(please refer the relevant clause for supply of paints, thinners etc)		Yes	
3.1.1.5	Preparation storage at site for proper stacking of materials		Yes	
3.1.2	ERECTION TESTING & COMMISSIONING		Yes	
3.1.2.1	Erection drawings/documents/working instructions etc	Yes		
3.1.2.2	Welding schedules	Yes		

Sl.No	Description PART III ERECTION TESTING & COMMISSIONING	Scope / to be taken care by		Remarks
		BHEL	Bidder	
3.1.2.3	Engineering drawings for construction methods		Yes	
3.1.2.4	Organising the resources required for erection, testing &commissioning of the materials covered under the scope and executing the work as per instruction of BHEL engineer		Yes	In Consultation with BHEL.
3.1.2.5	Final painting of all the materials erected		Yes	
3.1.2.6	Demobilization of the erection site		Yes	
3.1.2.7	Cleaning of / upkeep of erection / preassembly /storage areas		Yes	
3.1.2.8	Return of excess materials drawn to BHEL stores/ customer		Yes	
3.1.2.9	Reconciliation of all the consumables, T&P drawn from BHEL / customer ` s store		Yes	
3.1.2.10	Filling up quality log sheets		Yes	
3.1.2.11	Providing all temporary arrangements like platforms, scaffoldings etc for execution		Yes	
3.1.2.12	Assistance for P.G test		Yes	
3.1.3	CIVIL WORKS		Yes	
3.1.3.1	Taking over of foundations		Yes	
3.1.3.2	Checking, chipping and correcting final dimensins of the foundations if required		Yes	
3.1.3.3	Placement, erection of embedded parts integral for the scope of work and coordination with customer's civil/other agencies for embedments		Yes	
3.1.3.4	Bolt grouting with grout as specified		Yes	
3.1.3.5	Final grouting of all the equipments covered under this scope		Yes	
3.1.4	STATUTORY CLEARANCES		Yes	

Sl.No	Description PART III ERECTION TESTING & COMMISSIONING	Scope / to be taken care by		Remarks
		BHEL	Bidder	
3.1.4.1	Labour license		Yes	
3.1.4.2	Provident fund		Yes	
3.1.4.3	Insurance what ever comes under bidder's scope		Yes	
3.1.4.4	Workmen compensation		Yes	
3.1.4.5	Minimum wages		Yes	
3.1.4.6	Sales tax		Yes	
3.1.4.7	Local laws governing the works like electrical inspectorate, factory inspectorate, etc		Yes	
3.1.4.8	Professional tax		Yes	
3.1.4.9	Safety rules and regulations		Yes	
3.1.4.10	Approval from competent authority for installation like IBR etc		Yes	
3.1.5	SUBMISSION OF REPORTS		Yes	
3.1.5.1	Man power deployment category wise and area wise		Yes	
3.1.5.2	Deployment of tools and plant , area wise		Yes	
3.1.5.3	Consumables used		Yes	
3.1.5.4	Erection log		Yes	
3.1.5.5	Erection data PGMADU wise		Yes	
3.1.5.6	Data on joints welded as per log sheet/ welding schedule		Yes	
3.1.5.7	Materials management reports as per instruction of BHEL		Yes	
3.1.5.8	Meeting between BHEL and bidder at BHEL office every day for monitoring the progress		Yes	

SECTION VII APPENDIX – II

WEIGHT SCHEDULE

2 X 250 MW – Neyveli TS II Expansion Project Unit 1 & 2

SCHEDULE OF WEIGHTS

SL No.	PG	DESCRIPTION	WEIGHT (MT) Per Unit (Approx)
01	39	External Supporting structures	270.00
02	48	Ducts (BOF to Chimney)	850.00
03	78	ESP	3621.00
04	89	Gallaries & Platforms	70.00
		Total per Unit(approx)	**4811.00**
		Total for Unit 1 & 2(approx)	**9622.00**

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 ESP and its aux. The quoted rate shall be applicable for such product group also

3. Insulation : With respect to insulation, it shall be limited only to the application of for the inner roof of ESP, including fixing components.

4. The Erection & alignment of rectifier transformer is in the scope of contractor. However, dry out, testing and commissioning is not in the scope of this contract.

5. Erection & dismantling of air blowers and connecting pipes & ducts, providing blank/ dummies at the required locations and conducting gas-tightness test is in the scope contract and shall be carried out with in the quoted rate.

SECTION – VII

APPENDIX – III

AA) The following minimum Tools & Plants shall be arranged by the contractor for execution of this contract with in the quoted rate.

S.No	Description	Qty
1	18 T Crawler Crane	1 No
2	8 T Mobile Crane	1 No

Copy of ownership of the above T & P's or the documents with respect to the tie up in the form of a registered agreement with a resourceful party are to be enclosed along with the offer.

BB) List of Tools & Plants to be made available by BHEL to contractor free of hire charges on sharing basis

S.No	Description	Qty
1	150T Crawler Crane	1 No
2	75 T crawler crane	1 No
3	18 T crawler crane	1 No
4	Blowers for Gas tightness Test	2 Nos
5	Huck Bolting Machine	1 No

NOTE

1) All the above T & P's shall be given to contractor on sharable basis and the allotment is made by BHEL/Site in Charge, on need basis.

2) For 75 T crane and 18 T crane contractor shall provide the qualified operator. For 150 T cranes contractor to identify two operators who will be trained and used for assisting BHEL operator at all time whenever the crane is in use.

3) For all the cranes, the contractor, within the quoted rate shall provide fuel.

4) 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.

5) The day to day and routine maintenance of BHEL cranes (only) will be carried out by BHEL. All the BHEL supplied craned have to be handed over to maintenance through BHEL(I/C) on daily basis as indicated by the site In-charge, preferably after 7 PM. The crane will be re-allotted on the next day after due maintenance. However the modification of boom length to suit erection requirement shall be carried out by the erection contractor within the quoted rate.

6) The fuel tank fitted in the crane should not be by-passed by the agency.

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

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

SECTION VII APPENDIX – IV

PAINTING SCHEME

1.0 SCOPE

1.1 This section covers the painting requirements for the power plant equipment, structures, piping etc. and any other surface required to be painted.

2.0 CODES AND STANDARDS

Painting of equipment shall be carried out as per the specifications indicated below and shall conform to the relevant IS specification for the material and workmanship.

The following Indian Standards may be referred to for carrying out the painting job :

IS:5 : Colours for ready mixed paints and enamels

IS:1303 : Glossary of terms relating to paints

IS:2379 : Colour code for identification of pipelines

IS:1477 : Code of practice for painting of ferrous metals in buildings (Parts I & II)

IS:2524 : Code of practice for painting of non-ferrous metals in buildings (Parts I & II)

IS:2395 : Code of practice for painting of concrete, masonry and plaster surfaces (Parts I & II)

IS:2338 : Code of practice for finishing of wood and wood based materials (Parts I & II)

IS:6278 : Code of practice for white washing and colour washing

IS:3140 : Code of practice for painting asbestos cement building products

IS:158 : Ready mixed paint, brushing, bituminous, black, leadfree, acid, alkali, water and heat resisting

IS : 2074 : Ready mixed paint, air drying, red Oxide Zinc Chrome, priming
IS : 104 : Ready mixed paint, brushing, Zinc Chrome, priming
IS : 2932 : Enamel , synthetic, exterior (a) undercoating (b) finishing specification.

3.0 PREPARATION OF SURFACES

All surfaces to be painted shall be thoroughly cleaned of all grease, oil, loose mill scale, dust, rust and any other foreign matter. Mechanical cleaning by power tool and scrapping with steel wire brushes shall be adopted to clear the surfaces. However, in certain locations where power tool cleaning cannot be carried out, sand scrapping may be permitted with steel wire brushes and/or abrasive paper. Cleaning with solvents shall be resorted to only in such areas where other methods specified above have not achieved the desired results. Cleaning with solvents shall be adopted only after written approval of the PURCHASER/CONSULTANT.

4.0 PRIMER PAINTS (P)

Primer paints shall be applied only on dry and clean surfaces:

4.1 Primer paint P1: (Epoxy based)

A two pack air drying epoxy polyamide resin based red oxide –zinc phosphate (primer):

Epoxy content (% wt)	15 to 18
Air drying time	About 30 minutes (touch dry) Over night (hard dry)
Dry film thickness (DFT/coat)	30 microns (min)
Temperature resistance	Upto 120 deg.C dry heat

4.2 **Primer paint P2 (Epoxy based)**

A two pack air drying epoxy polyamide with zinc dust of at least 92% zinc dust on the dry film.

Epoxy content (% wt)	8 to 10
Air drying time	About 10 minutes (touch dry) 2 hours (hard dry)
Dry film thickness (DFT/coat)	40 microns (min)
Temperature resistance	Upto 300 deg.C dry heat

4.3 **Primer paint P3 (Ethyl zinc silicate, EZS, based)**

A two pack heavy duty zinc dust rich silicate primer:

Total solids (% wt)	84 + or - 2
Air drying time	16 hours
Density	3.07 +/- 0.005
Dry film thickness (DFT/coat)	60 microns (min)
Temperature resistance	Upto 450 deg.C dry heat

4.4 **Intermediate paints (I)**

These paints shall be applied over primer coats as an intermediate layer to provide weather proof seal of primer coats.

4.5 **Intermediate paint II**

A two pack air drying high build epoxy resin based paint with MIO.

Air drying time	6 to 8 hours (touch dry) 7 days (full cure)
Dry film thickness (DFT/coat)	100 microns
Temperature resistance	Upto 180 deg.C dry heat
Compatible with	Primer P1 and P2

5.0 FINISH PAINT

Finish paint coats shall be applied over primer coats and intermediate coats after proper cleaning and touch up of primed coats.

5.1 Finish paint F1

A two pack air drying epoxy polyamide enamel suitably pigmented.

Air drying time	2 to 3 hours (touch dry) 7 days (full cure)
Dry film thickness (DFT/coat)	40 microns
Temperature resistance	Upto 130 deg.C dry heat
Compatible with	Primers P1 and P2 Intermediate II
Colour	Generally all shades

5.2 Finish paint F2

A single pack synthetic rubber based enamel paint.

Air drying time	2 hours (touch dry) 24 hours (hand dry)
Dry film thickness (DFT/coat)	25 microns
Temperature resistance	Upto 200 deg.C dry heat
Compatible with	No primers
Colour	Generally all shades

5.3 The colour / shade shall be as approved by the PURCHASER/ CONSULTANT. After cleaning the dust on the dried up primer, first coat of synthetic enamel shall be applied. After this first coat dries up hard, the surface is wet scrubbed cutting down to a smooth finish and ensuring that at no place the first coat is completely removed. After allowing the water to get evaporated completely, the second finish coat of synthetic enamel paint shall be applied.

5.4 Equipment no. and the name of the equipment shall be painted on the surface of the equipments on visible locations. Service of the Pipe/Line designation with arrow identification for the direction of flow shall be painted on all pipes at visible locations at an interval of 20 metres. Wherever pipe lines are insulated, the service of the piping and arrow mark shall be painted over the clad surface.

6.0 SUGGESTED COLOUR CODES FOR PAINTING

SL. NO.	ITEM/SERVICE	COLOUR	IS-5	COLOUR (BAND)	IS-5
1.0	Structures,platforms, galleries, ladders and handrails	Dark Admirality Grey	632	-	-
2.0	Boiler casing, ESP and ducting	Nut Brown	413	-	-
3.0	Fans, pumps, motors, compressors, Blowers	Light Grey	631	-	-
4.0	Tanks (without insulation and cladding)				
4.1	Outdoor ,Stand pipes,vent pipes	Aluminium	-	-	-
4.2	Indoor	Aluminium	-	-	-
5.0	Vessels & all other proprietary equipment (without insulation & cladding)	Light grey	631	-	-
6.0	Switchgear	Light grey	631	-	-
7.0	Control & relay panels	Light grey	631/7078 of IS 1650	-	-
8.0	Turbine	Golden Yellow	356	-	-
9.0	Generator & exciter	Light grey	631	--	-
10.0	**Transformers**	**Dark Admiralty Grey**	**632**	**-**	**-**
11.0	Machinery guards	Signal red	537	-	-

SL. NO.	ITEM/SERVICE	COLOUR	IS-5	COLOUR (BAND)	IS-5
12.0	Piping (without insulation and cladding)				
12.1	Water System				
a)	Boiler feed	Sea green	217	-	-
b)	Condensate	Sea green	217	Light brown	410
c)	D M Water	Sea Green	217	Light orange	557
d)	Soft water	Sea green	217	French blue	166
e)	Bearing cooling water	Sea green	217	French blue	166
f)	Potable & filtered water	Sea green	217	French blue	166
g)	Service & clarified water	Sea green	217	French blue	166
h)	Raw water	Sea green	217	White	-
i)	Cooling water	Sea green	217	French blue	166
12.2	Compressed Air System				
a)	Service air	Sky Blue	101	-	-
b)	Instrument air	blue	101	White	-
12.3	Oil system				
a)	Fuel oil	Light brown	410	French	166
b)	Light oil	Dark Brown	412	Brilliant green	221
c)	Lubricating oil	Light brown	410	Light grey	631
d)	Control oil	Light brown	410	Light orange	557
e)	Transformer oil	Light brown	410	Light orange	557
12.4	Gas system				
a)	Hydrogen	Canary yellow	309	Post office red	538
b)	Carbon dioxide	Canary yellow	309	Light grey	631
12.5	Fire services	Fire red	536	-	-

SL. NO.	ITEM/SERVICE	COLOUR	IS-5	COLOUR (BAND)	IS-5
12.6	Ash slurry pipes	Black	-	-	-
12.7	Vacuum pipes	Sky blue	101	Black	-
12.8	Fuel pipes (lignite)	Light brown	410	-	-
12.9	Drainage	Black	-	-	-
12.10	Stand pipes and all Vent pipes	Aluminium	-	-	-
12.11	Bottom Ash system	Light Grey	631	-	-
12.12	Powdered Limestone handling system	White with green band	-	-	-

Notes :

1. This colour code basically refers to IS:2379 for piping with necessary modifications.
2. Where band colour is specified, same shall be provided at 10 meter intervals on long uninterrupted lines and also adjacent to valves and junctions.

7.0 PAINT APPLICATION

7.1 Paint shall be applied in accordance with manufacturer's recommendations. The work shall generally follow IS 1477 (Part II) for jobs carried out in India and SSPC-PA-I or DIN 55928 or equivalent for jobs carried out outside India.

7.2 Paint shall not be applied when the ambient temperature is 5 deg. C and below. Also paint shall not be applied in rain, wind, fog or at relative humidity of 80% and above.

7.3 Each coat of paint shall be continuous, free of pores and of even film thickness without thin spots.

7.4 Each coat of paint shall be dry sufficiently before application of next coat.

7.5 The Contractor shall furnish paint manufacturer's test report or technical data sheet pertaining to the paint selected. The data sheet shall indicate among other things the relevant standards, if any, composition in weight percent of pigments, vehicles, additives, drying time, viscosity, spreading rate, flash points, methods of application quality of surface preparation required, corrosion resistance properties and color.

7.6 Painting scheme

7.6.1 Type of paint products like P1, P2, P3, I1, F1, F2 and F3 has been specified elsewhere in the specification.

7.6.2 For a complete painting scheme of any item being painted, all types of paints are to be procured from the same manufacturer as approved by the purchaser.

7.7 Legend

Sa - 2 .5 – The quality of surface cleaning, i.e 95 % of the surface area is free from all rust, mill scales and visible residues, foreign materials etc.

SP - surface preparation quality

2P1 - Two (2) coats of primer paint type P1

1I1 - One (1) coat of intermediate paint type I1

2F1 - Two (2) coats of finish paint type F1

DFT - Dry film thickness

CRT - Clean and retouch.

The painting scheme to be followed for various equipment / structures is briefly given below for guidance to the Contractor.

Sl. No.	Description	Painting scheme		Total DFT in Microns
		At shop	**At site**	
1.	Steel structure	SP-Sa 2 ½ 2P1 + 1 I 1	2F1	240
2.	Mechanical equip-ment (temperature not over 80 deg.C) Both static and rotary equipment for indoor or outdoor duty	SP-Sa 2 ½ **2P1 + 1 I1**	2F1	240
3.	Equipment with hot surfaces (temperature upto 400 Deg,C)	SP-Sa 2 ½ 2P2	2F2	130
4.	Equipment with hot surfaces (temperature above 400 Deg.C)	SP – Sa 2 ½ 2P3	2F2	170

5.	Non insulated pipe/duct works	SP-Sa 2 ½ 2P1 + 1 I1	2F1	240
6.	Insulated pipe/duct works	SP – Sa 2 ½ 2 coats primer suitable for intended temperature application as per the manufacturer's recommenda-tion. The primers selection shall be done generally inline with the specification laid down in clauses above.	2F2 Final painting shall be done over the cladding. In case of aluminium cladding, final painting will not be required.	60-120

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:1207 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:1207

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
474, Anna Salai, Nandanam, Chennai – 600 035.

SECTION VII

APPENDIX - VII

CHECK LIST

TENDER SPECTFICATION NO, BHEL: PSSR : SCT : 1207

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: 1207

FOR

Handling at site stores/storage yard, transportation to site of work, Erection, Testing and commissioning of Electrostatic precipitator and its auxiliaries, supply and application of final painting for Unit 1 & 2 of 2 X 250 MW set at Neyveli TS II Expn at Neyveli, Tamil Nadu – Floating of Open Tender.

at

Neyveli Thermal Power Station II

Expansion

Unit 2 x 250 MW

Neyveli, Cuddalore Dist. Tamilnadu.

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:1207

NAME OF WORK

Handling at site stores/storage yard, transportation to site of work, Erection, Testing and commissioning of Electrostatic precipitator and its auxiliaries, supply and application of final painting for Unit 1 & 2 of 2 X 250 MW set at Neyveli TS II Expn at Neyveli, Tamil Nadu – Floating of Open Tender.

(PRICE BID)

PART II

Issued to
M/s.

For and on behalf of
BHARAT HEAVY ELECTRICALS LIMITED

Senior Deputy General Manager/Contracts

(This tender document is not transferable)

Place: Chennai-600 035.
Date:

SECTION VII APPENDIX – VIII

RATE SCHEDULE

BHEL- PSSR - SCT :1207

Please see the Note Before Quoting

Sl.	Description of Work	Approx. Weight in MT	Rate / MT In Rs.	Amount FIGRS & Words
01.	Erection, testing, commissioning of ESP and its auxiliaries, Including supporting structures and columns, stairways, floor grills, hand-rails etc. and also the external platforms and ID system ducting with structures, including supply & application of final painting as per detailed description and nature of works as enumerated in the tender specification and also as per the BHEL drawing including supply of necessary consumables, tools and tackles, all handling and transportation from BHEL stores, preservation of components in the erection site and other incidental works during pre assembly, erection, testing and commissioning works as detailed in the Tender Specification.	4811 MT (per Unit)		

Total for Unit 1 &2 = 9622 MT

SIGNATURE OF THE TENDERER

NOTE TO RATE SCHEDULE:

1. The quantities indicated in column 3 are approximate and are liable for variation and alteration at the discretion of BHEL. The quoted unit rate shall be applicable for any additional product groups of manufacturing unit, 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 description of work indicated in the Rate Schedule shall include all types of handling and transportation of materials from storage yard / pre-assembly yard to the place of erection, preservation of components at the erection site with contractor's own handling equipments including any extra work with modification / rectification that may arise during erection testing and commissioning works which are incidental to normal erection works.

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