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TENDER NO. DLI:BTD-3:R&M-C&I:10-037

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ORIGINAL COPY**

# **TENDER SPECIFICATIONS**

**TENDER NO. DLI:BTD-3:R&M-C&I:10-037**

**FOR**

**Tender for the work of "C & I works of Boiler, TG and Station C& I  
For R & M and Up-rating job of Unit # 3, 110 MW, GNDTP Bhatinda"**

## **PART I – TECHNICAL BID**



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



ISO 9001-2000, ISO  
14001 and OHSAS  
18001 certified  
company  
SubContract and  
Purchase Deptt.

**Bharat Heavy Electricals Limited**  
(A Govt. Of India Undertaking)  
**Power Sector – Northern Region,**  
Plot No. 25 , Sector - 16A ,  
Distt. Gautam Budh Nagar, NOIDA – 201 301(INDIA)  
Phone: 0091-0120-2515441 / 2515408 / 2515449  
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**IMPORTANT NOTE**

PURCHASER OF THIS TENDER DOCUMENT IS ADVISED TO CHECK AND ENSURE COMPLETION OF ALL PAGES OF TENDER DOCUMENT AND REPORT ANY DISCREPANCY TIMELY FOR CORRECTIVE ACTION, IF ANY, TO THE ISSUING AUTHORITY BEFORE THE BIDS ARE SUBMITTED. ORIGINAL COPY OF TENDER DOCUMENT COMPLETE IN ALL RESPECTS MUST BE SUBMITTED BACK AS PART OF THE BID WITHOUT WHICH THE SAME IS LIABLE TO BE REJECTED BY BHEL.

THIS TENDER SPECIFICATION ISSUED TO:

M/S-----  
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### **TENDER NOTICE**

**Sealed tenders are invited from the contractors fulfilling qualifying requirements for the work of “C & I works of Boiler, TG and Station C& I For R & M and Up-rating job of Unit # 3, 110 MW, GNDTP Bhatinda”**

**TENDER NO. [DLI:BTD-3:R&M-C&I:10-037](#)**

#### **QUALIFYING REQUIREMENTS:**

- 1.0 Tenderer should have executed similar nature C&I works consisting of Boiler and Turbine Control panels and related field instrumentation works in Power/ Nuclear/ Industrial Projects with single unit rating of 60 MW or above during last seven years reckoned as on the date of bid opening.  
‘AND’
- 2.0 Tenderers should also have an average annual turnover of minimum of Rs.250 Lacs (Rupees Two Hundred Fifty Lacs only) based on the audited accounts of last three financial years (2006-07, 2007-08 & 2008-09). Bidders shall submit audited annual accounts (balance sheets and profit & loss account) in support of this.

#### **NOTES:**

- (i) **The Tender Documents comprise of following;**
  - (a) General Conditions of Contract(GCC), Special Conditions of Contract(SCC),Tender Notice, Project Synopsis, etc.
  - (b) Rate Schedule
- (ii) Tender Documents with complete details are hosted on BHEL’s web page [www.bhel.com](http://www.bhel.com). And also at [www.bhel.com](http://www.bhel.com). Bidder(s) intending to participate may download the tender document from the web site. Bidder(s) downloading the tender documents from the web site, shall remit Rs.1000/- (Rupees One thousand only) in the form of crossed demand draft (non-refundable), in favour of BHEL, NOIDA along with their offer

- (iii) Bidder(s) can also purchase hard copy of tender documents from this office. Tender documents (non transferable) will be issued on all working days between 09.30 Hrs. to 12.30 Hrs within the sale period i.e **upto 03.05.2010** on payment of Rs.1,000/- (non-refundable) either in cash or by crossed demand draft in favour of BHEL, NOIDA. Request for issue of tender document should clearly indicate Tender No. and work.
- (iv) Tenders must be submitted in the office of the undersigned in Room No. 300, PSNR, NOIDA latest by **15:00 Hrs. on 03.05.2010**. Technical bids shall be opened at **15.30 Hrs. on 03.05.2010**. Tenders received after the due date & time shall be liable to be summarily rejected.
- (v) Earnest Money Deposit (EMD): Refundable, Non-interest bearing **EMD of Rs 1,00,000/-** shall be deposited by Account Payee Pay Order 'OR' Demand Draft in favour of " Bharat Heavy Electricals Limited" payable at Delhi/NOIDA . Those bidders who have already deposited ' One Time 'EMD' of Rs. 1,00,000/- with BHEL, PSNR, Services, NOIDA or Rs. 2,00,000/- with BHEL, PSNR-SCP, NOIDA need not submit EMD with the present tender.
- (vi) Tenders not accompanied with Full Earnest Money Deposit, as indicated above, will not be considered.
- (vii) **All corrigenda, addenda, amendments and clarifications to this Tender will be hosted in the related web page and not in the newspaper. Bidders shall keep themselves updated with all such amendments.**
- (viii) BHEL reserves the right to accept or reject any or all tenders without assigning any reason whatsoever.
- (ix) BHEL takes no responsibility for any delay/loss of documents or correspondences sent by courier/post.
- (x) **BHEL reserves the right to go for a Reverse Auction instead of Opening the submitted sealed bid, which will be decided after technical evaluation. As such, the bidders should submit their best prices in the 'Sealed Price Bid'. However, bidders are required to confirm their acceptance of "General terms and conditions" governing RA specifically in their technical bid. The "General terms and conditions" governing RA are given in the SCC of the NIT. Bidders are also required to furnish following details in their techno-commercial bid, for this purpose (RA).**

Authorization of representative who will participate in the on line Reverse Auction Process;

- a. Name and Designation of official
  - b. Postal Address (Complete)
  - c. Telephone Nos. (Land line & Mobile both)
  - d. FAX No.
  - e. E-mail address
  - f. Name of Place/State/Country, wherefrom he will participate in the RA.
- (xi) Bids, once submitted, shall not be returned.
  - (xii) Unsolicited discount/rebate shall not be accepted after bid opening.
  - (xiii) Purchase Preference will be given to CPSU's as per Govt. Guidelines.

**Sr. DGM/SCP**



ISO 9001-2000,  
ISO 14001 and  
OHSAS 18001  
certified  
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## TENDER NOTICE - NEWSPAPER

LAST DATE OF SALE : 03.05.2010  
DUE DATE OF SUBMISSION : 03.05.2010 (15:00 Hrs.)

NIT NO. / NAME OF WORK
<p style="text-align: center;"><b>TENDER NO. <a href="#">DLI:BTD-3:R&amp;M-C&amp;I:10-037</a></b></p> <p>Sealed tenders are invited from the contractors fulfilling qualifying requirements given in the detailed tender specifications for the work of " <b>C &amp; I works of Boiler, TG and Station C&amp; I For R &amp; M and Up-rating job of Unit # 3, 110 MW, GNDTP Bhatinda</b>".</p>

### NOTES:-

1. Purchase Preference will be given to CPSU as per Govt. Guidelines.
2. Please visit our website at [www.bhel.com](http://www.bhel.com) or [www.bhel.com](http://www.bhel.com) for complete details of the tender.
3. All corrigenda, addenda, amendments and clarifications to this Tender will be hosted on above web page and not in the newspaper. Bidders shall keep themselves updated with all such amendments.

Sr. DGM/SCP

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**PROCEDURE FOR SUBMISSION OF SEALED TENDERS:**

The tenderers must submit their tenders as required in **two parts** in separate sealed covers **prominently superscribed as Part-I Technical bid and Part-II ,Price bid** also indicating on each of the cover tender specification no., date and time as mentioned in tender notice.

**TECHNICAL BID (COVER-I)**

Except **Price bid Part-II**, complete set of tender document consisting of General conditions of Contract, “Technical specification & Special terms and condition” ( Part-I) issued by BHEL shall be enclosed in **Part I Technical Bid only**. All schedules, data sheets and details called for in the specification shall also be submitted along with technical bid. All details / Data / Schedules including offer letter duly signed and stamped are to be **submitted in duplicate**.

**PRICE BID (COVER-II)**

Tenderers may please note that price bid is **to be submitted only in original copy** of Tender i.e. Price bid (Part-II) issued by BHEL and no duplicate copy of same is required.

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

## **PROJECT SYNOPSIS**

M/S Punjab State Electricity Board , a State Government Undertaking with head office at Patiala , Punjab has entrusted BHEL for Renovation , Modernisation And Uprating of Unit-3 from 110 MW to 120 MW at Bathinda Thermal Plant. The existing unit of 110 MW is of BHEL make and new equipments are also being supplied by BHEL . The job involves dismantling of old C&I systems and installation and commissioning of newly supplied control and Instrumentation systems.

The site location is about 300 Km from New Delhi via Rohtak. The nearest Railway station is Bathinda and it is about 5 Kms from thermal plant. The nearest domestic airport is New Delhi/Chandigarh. The site is very well connected with road and rail.

All bidders are advised to visit site and see for themselves the conditions prevailing there.

The maximum temperature attained is 47-48 degree C in May June every year and the minimum Temperature touches 4-5 degree C in December / January .

## **SECTION-III PART-A**

### **SPECIAL CONDITIONS OF CONTRACT**

#### **INDEX**

Clause	Description
34.0	General
35.0	Civil works, foundation and grouting
36.0	Consumables
37.0	Tools & Plants/ IMTE's
38.0	Supervisory staff & workmen
39.0	Material handling and storage
40.0	Preservation of components
41.0	Welding and NDT
42.0	Progress reporting
43.0	Drawings & documents
44.0.	Income tax, Service Tax & sales tax etc.
45.0	Extra work
46.0	Price Variation
47.0	Rate schedule
48.0	Instructions to tenderer
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## SECTION-III PART `A`

### SPECIAL CONDITIONS OF CONTRACT

#### 34.0 GENERAL

- 34.1 The intent of this specification is to provide Renovation and modernization of C& I package of power plants . It includes dismantling of existing system ( panels, cables, instruments etc ),erection of new system/ panels/instruments and commissioning services for execution of projects according to most modern and proven techniques and codes. The mission of specific reference to any method and equipment or material necessary for the proper and efficient services towards installation of the plant shall not relieve the contractor of the responsibility of providing such services, facilities to complete the project or portion of project awarded to him. The quoted rate shall deem to be inclusive of al such contingencies .
- 34.2 The contractor shall carry out the work in accordance with standard practices / codes /instructions /drawings/ documents / specification supplied by BHEL from time to time.
- 34.3 The work shall conform to dimensions and tolerances given in various drawings and documents that will be provided during erection. If any portion of work is found to be defective in workmanship, not conforming to drawings or other stipulations, the contractor shall dismantle and redo the work duly replacing the defective materials at his cost failing which the job will be carried out by BHEL by engaging other agencies / departmentally and recoveries will be effected from contractor's bills towards expenditure incurred including BHEL's usual overhead charges.
- 34.4 Following shall be the responsibility of contractor and have to be provided within finally accepted rates / prices :
- (a) Provision of all types of labour, supervisors, Engineers, watch and ward as required, tools & tackles, calibrated inspection, measuring and test equipment as specified and otherwise required for the work and consumable for erection, testing and commissioning including material handling.
  - (b) Proper out-turn as per BHEL plan and commitment.
  - (c) Completion of work as per BHEL Schedule.
  - (d) Good quality and accurate workmanship for proper performances of equipment.
  - (e) Repair,rectification and modification in electrical circuits/wiring involving removal of connections & redoing as per modification.
  - (f) Preservation / Reconservation of all components during storage / erection till handing over.
- 34.5 **BHEL-Power Sector(NR) is ISO 9001, ISO 14001, OHSAS 18001, BS 7799 and SA-8000 certified company. Quality of work, to customer's satisfaction and system requirements is the essence of these certifications. The contractor in all respects will organize his work, systems, environment, process control documentation, tools, plant, inspection, measuring and testing equipments etc. as per instructions of BHEL engineer.**

- (A) The Contractor will be responsible for Health, Safety & Environment management (HSE) at site for the construction activities to be carried out by them in accordance with requirements given under section I (a) of GCC and elsewhere in this tender document. The contractor, who is awarded the work, shall have to sign an MOU w.r.t implementation of HSE conditions with BHEL. Contractor shall ensure deployment of Qualified & Experienced Safety Engineer / Officer at site. It may be noted that non-compliance to HSE requirements will result in penal action as may be decided by BHEL.

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

- No outsider is allowed to enter construction area without permission.
- No body is allowed to enter at construction site without Safety Shoe.
- Never enter work area without Safety helmet & chin strap in place.
- No climbing/working allowed without proper safety belt above 2 m. height.
- Do not exceed the speed limit 25 Kmph within premises.
- No debris obstacles allowed on the roads & passages.
- All accidents/incidents to be reported to site Incharge.
- Do not walk on pipelines or false ceiling.
- Maintain good Housekeeping at work site.
- No photography/ Videography allowed without permission
- Risk factor in construction is approximately 3 times the manufacturing sector.
- 85% of the workforce is drawn from rural background. They lack technical perspective & relevant industrial common sense. Safety awareness to be developed among these workers employed by Sub-contractors.
- Infrastructure to be developed for carrying out jobs properly in a safe manner.
- All Site supervisors & engineers (including subcontractor's) must be imparted structured training on construction safety before start of the job & record to be maintained.
- Availability of qualified & trained Site Engineer at site during all working hours.
- Site Safety training to be imparted to all workers & plan to be made to cover every worker.
- Tools box talk (5-15 minutes) by supervisor prior to commencement of any job.
- All accident / incidents(Near Miss) to be reported & investigated.(formats & procedure should be finalized)
- Daily Safety Checking by Each Site Engineer along with Safety engineer.
- Weekly co-ordination meeting of all Safety engineers with BHEL safety officer.
- Monthly safety meeting with Site In-charges.
- Reports: Weekly/monthly/annual SHE report format should be finalized.
- All Safety equipment must be ISI marked & checked by Safety officer before use.
- Tag system for erection & use of scaffoldings.
- Bamboo/wooden Scaffolding material not allowed.
- LPG cylinders not allowed for gas cutting.
- Good House keeping. Separate waste bins to be used for flammable & non flammable material.
- Safety awareness programs for workers by display of boards, posters, competitions, talks etc.
- Deployment of Safety Supervisors for every 250 workers and part there of at work site.
- Display of List of First Aid trained persons.
- Testing certificates for lifting tools & tackle.
- Provision & maintenance of fire extinguishers at construction site & material stores.
- Display of emergency telephone numbers at various locations.
- For work in confined space use 24 V lamp fitting & use tools with air motors or electric tools with max. 24 V.
- For confined space entry Gas test must be done before & at regular intervals.
- Checking & tag of equipment like grinding machine, welding machine, gas cutting set etc. by supervisors before use.

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

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

Contractor shall ensure following:

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

The Contractor shall be fully responsible for accidents caused due to him or his agents or workmen's negligence or carelessness in regard to the observance of the safety requirements and shall be liable to pay compensation for injuries. **It may be noted that non-compliance to HSE requirements will result in penal action. In case of violations of safety requirements, the Contractor shall be liable for a penalty of Rs. 200/- for the first violation and Rs. 500/- for the subsequent violations. For serious lapses, as decided by BHEL Engineer, fines upto Rs. 5000/- at a time can be imposed.**

The amount towards penalties as above will be deducted from running bills of the Contractor. The amount so collected above will be utilized for supporting the safety activities at site. The decision of BHEL on above will be final and binding on the Contractor.

#### **34.6 The contractor shall comply with following towards Social Accountability;**

- (a) The contractor shall not employ any employee less than 15 years of age in pursuant to ILO convention. If any child labour were found to have been engaged, the Contractor shall be levied with expenses of bearing his education expenditure which will include stipend to substantiate appropriate education or employ any other member of family enabling to bear the child education expenditure.
- (b) The contractor shall not engage Forced/Bonded Labour and shall abide by abolition of Bonded Labour System (Abolition) Act, 1976.
- (c) The contractor shall maintain Health & safety requirement as stipulated in the Contract and Contract Labour (Regulation & Abolition) Act, 1970.
- (d) The Contractor shall abide by UN convention w.r.t Human Rights and shall be liable for Discrimination/Corporal punishment for failure in meeting with relevant requirements.
- (e) The Contractor shall abide the requirement of Contract Labour (Regulation & Abolition) Act, 1970 for working hours.

- (f) The Contractor shall abide by the Statutory requirement of Minimum Wages Act 1948, payment of Wages Act 1936.
- (g) The Contractor shall arrange potable drinking water to its employees & workers.

### 35.0 CIVIL WORKS, FOUNDATIONS AND GROUTING.

- 35.1 Foundation for all equipment shall be provided by client of BHEL. The dimensions and locations of the foundations, pockets, anchor bolt pitch 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 minor adjustments of foundation level, dressing and chipping of foundation surfaces upto 50mm, enlarging the pockets in foundations etc., increasing the existing floor opening for cable entry, fixing panels and repair of same as may be required for the erection of equipment / plants shall be carried out by the contractor.
- 35.2 While on the job, care is essential to avoid too much chipping and resultant lowering of level. In case of excess chipping, contractor is to arrange additional packing plates as per requirements provided it is allowed by BHEL Engineer.
- 35.3 The contractor shall ensure perfect matching of structure / equipment , packer plates including machining , scraping and blue matching with foundation by dressing the foundation. BHEL at its discretion can accept rough chipping of foundations, embedding packer plates in cement mortar
- 35.4 The contractor shall arrange for grouting of foundation bolt holes of structure/ equipment using port land cement as specified in the drawings /specification or as advised by Engineer after preparing foundation top surface for grouting. **All the arrangement required for grouting including supply of cement, sand & any other material required for grouting, shuttering, nails, wires etc., shall be arranged by the contractor at their cost.**
- 35.5 Besides grouting as above, any civil works required for safe and efficient operation of tools and tackles like grouting / excavation / casting of foundation / anchor points for derricks, winches, guy ropes fastening, etc. any other temporary supports shall also be the contractor's responsibility. For these civil works all materials including cement and required facilities will have to be arranged by contractor at his own cost.
- 35.6 **In order to remove the equipments / facilitate entry of new equipment , the Contractor may have to remove and refix existing glass / aluminum partition , or demolish existing brick wall and build it back later . In all these cases , the work has to be carried out carefully without affecting the other equipments / civil structures / installations in the nearby areas and as per the instruction of the Engineer . All equipments , materials and consumables ( except structural steel ) required to carry out such work will have to be provided by the Contractor in his quoted price .**

### 36.0 CONSUMABLES

- 36.1 All consumables, welding electrodes, oxygen, Argon, Gases, Paints, cable lugs, ferrules, cable ties, sleeves, nylon tapes, washers etc. required for erection, and cable terminations shall be arranged by contractor at their own cost
- 36.2 It shall be the responsibility of the contractor to plan the activities and store sufficient quantity of consumables. Non availability of any consumable materials or equivalent suggested by BHEL cannot be considered as reason for not attaining the required progress or for additional claim.

- 36.3 It shall be the responsibility of the contractor to obtain prior approval of BHEL, regarding suppliers, type of electrodes etc. before procurement of welding electrodes / TIG wires. On receipt of electrodes at site these shall be subjected to inspection and approval by BHEL. The contractor shall inform BHEL details regarding type of electrodes, batch No. date of expiry etc. and produce test certificate for each lot / batch with correlation of batch / lot no. with respective test certificate. No electrode will be allowed to be used without valid test certificate.
- 36.4 BHEL reserves the right to reject the use of any consumable including electrodes, gases, lubricants / special consumables if it is not found to be of the required standard / make / purity or when shelf life has expired. Contractor shall ensure display of shelf life on consumable wherever required & records maintained.
- 36.5 Storage of all consumables including welding electrodes shall be done as per requirement / instruction of the Engineer by the contractor at his cost.
- 36.6 In case of improper arrangement for procurement of any consumable, BHEL reserves the right to procure the same from any source and recover the cost from the Contractor's first subsequent bill at market value plus the departmental charges of BHEL from time to time (30% at present). Postponement of such recovery is normally not permitted. The decision of Engineer in this regard shall be final and binding on the contractor.
- 36.7 All lubricants and chemicals required for testing , pre-commissioning, commissioning, preservation and lubricants for trial runs of the equipment shall be supplied by BHEL /BHEL's client. All services including labour and T&P will be provided by the contractor for handling, filling, emptying, refilling etc. The consumption of lubricants / chemicals shall be properly accounted for. Surplus material if any shall be properly stacked and returned to stores.
- 36.8 All charges on account of Octroi, terminal or sales tax and other duties on materials obtained for the works from any source shall be borne by the contractor.
- 36.9 **SCAFFOLDING** : All temporary structures/scaffolding if any required for the erection work is also part of the scope and no separate payment will be made or it.

### **37.0 TOOLS AND PLANTS / IMTE's**

- 37.1 The contractor at his cost shall arrange all the tools and tackles required for the satisfactory execution of the work. Aall other T&Ps and IMTEs which are required for successful and timely execution of the work covered within the scope of this tender, shall be arranged and provided by the contractor at his own cost in working condition (**As per Annexure- I & II**). In the event of the failure of contractor to bring necessary and sufficient T&Ps and IMTEs , BHEL will be at liberty to arrange the same at the risk and cost of contractor and hire charges as applicable shall be deducted from contractor's bill. Decision of BHEL in this regard shall be final and binding on contractor.
- 37.2 All distribution boards, connecting cables / welding cables, wire ropes, hoses etc. including temporary air/water / electrical connections etc. shall have to be arranged by the contractor at his own cost.

- 37.3 In case of non-availability of the T&Ps to be provided by BHEL due to breakdown, major overhauls, distribution pattern or any other reason, the contractor shall plan / amend / alter his activities to meet erection / commissioning targets in consultation with BHEL.
- 37.4 Contractor will set up his laboratory at site for testing /calibration of field instruments. The laboratory will have all standard testing and calibration equipments required for the job. All the standard instruments, measuring tools , IMTE's etc are to be calibrated periodically as per the requirement of BHEL and necessary calibration certificates/test certificate are to be submitted to BHEL before use. All field instruments will be calibrated before installation. If any instrument does not function properly in site and requires re-calibration , the same will be done by subcontractor without any extra cost to BHEL. Complete and Proper record of calibration will be maintained by the contractor. All calibrated field instruments will have stickers fixed on hem displaying their set values and date of calibration
- 37.5 Consolidation of ground and arrangement of sleepers / sand bag filling etc. for safe operation/ movement of equipment including cranes / trailers etc. shall be the responsibility of the contractor at his cost.
- 37.6 BHEL shall have lien on all T&PS, IMTEs & other equipment of the Contractor brought to the site for the purpose of erection, testing and commissioning. BHEL shall continue to hold the lien on all such items throughout the period of Contract. No material brought to the site shall be removed from the site by the Contractor and/or his Sub-contractors without the prior written approval of the Engineer.
- 37.7 The monthwise T&P deployment plan to be submitted as per **format (at Annexure-D to General Conditions of Contract)** is only to assess the capability as well as understanding of the contractor to execute the work. It shall be the contractor's responsibility to deploy the required T&P, for timely and successful completion of the job, to any extent over and above those indicated in the above deployment plan (including those which are not covered in the plan submitted) without any compensation on this account.
- 37.8 Regular utilisation report of the BHEL T&Ps and IMTEs as per requirement of BHEL shall be furnished by the contractor.

### **38.0 SUPERVISORY STAFF AND WORKMEN**

- 38.1 The contractor shall deploy all the skilled workmen like mill wright fitters, welders, gas cutter, riggers, sarangs, masons, carpenters, electricians, instrument technician etc., in addition to other skilled, semi-skilled and unskilled workmen required for all the works of handling and transporting from site storage to erection site, erection, testing and commissioning as contemplated under these specification. Only fully trained and competent men with previous experience on the job shall be employed. They shall hold valid certificates wherever necessary. BHEL reserves the right to decide on the suitability of the workers and other personnel who will be deployed by the contractor. BHEL reserves the right to ask for removal of any employee workman of the contractor at any time, if they find him unsuitable and the contractor shall forthwith remove him.
- 38.2 The supervisory staff including qualified Engineers deployed by the contractor shall ensure proper out-turn of work and discipline on the part of the labour put on the job by the contractor and in general see that the works are carried out in a safe and proper manner and in coordination with other labour and staff deployed directly by BHEL or other contractors of BHEL or BHEL's client / other agency.

- 38.3 The work shall be executed under the usual conditions affecting major power plant construction and in conjunction with numerous other operations at site. The contractor and his personnel shall cooperate with other personnel / contractor, coordinating his work with others and proceed in a manner that shall not delay or hinder the progress of work as a whole.
- 38.4 The contractor's supervisory staff shall execute the work in the most substantial and workman like manner in the stipulated time. Accuracy of work and aesthetic finish are essential part of this contract. The contractor shall be responsible to ensure that assembly and workmanship conform to the dimensions and tolerances given in the drawings /documents/ instructions given by BHEL Engineer from time to time.
- 38.5 The contractor shall deploy the necessary number of qualified and approved full time electricians at his cost to maintain his temporary electrical installation till the completion of work.
- 38.6 During the course of erection, if the progress is found unsatisfactory, or if the target dates fixed from time to time for every mile stones are to be advanced or in the opinion of BHEL, if it is found that the skilled workmen like fitters, Electricians , operators, technicians etc. deployed are not sufficient, BHEL after giving reasonable opportunity to the contractor, will induct on the work the required workmen in addition to contractor's workmen to improve the progress and recover from the contractor's bills any charges incurred for engaging the additional workmen with overheads.
- 38.7 It is the responsibility of the contractor to engage his workmen in shifts or on overtime basis for achieving the targets set by BHEL and also during the period of commissioning and testing of unit. The contractor's finally accepted rates / prices shall include all these contingencies.
- 38.8 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 wire, trees or any other property or to any part of 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.
- 38.9 The monthwise manpower deployment plan to be submitted as per format (**at Annexure-C to General Conditions of Contract**) is only to assess the capability as well as understanding of the contractor to execute the work. It shall be the contractor's responsibility to deploy the required man power, for timely and successful completion of the job, to any extent over and above those indicated in the above deployment plan (including those which are not covered in the plan submitted) without any compensation on this account. Separate persons shall be identified at site for quality control and safety by the contractor.

### **39.0 MATERIAL HANDLING AND STORAGE**

- 39.1 All the equipment and material furnished under this contract ( except those which are mentioned specifically in the scope of work) shall be received from the project stores, sheds/storage yards ( any place within site) and transported to be pre-assembly area/ erection site and stored in the storage spaces in a manner so that they are easily retrievable till they are erected by the contractor. While drawings/ lifting material from BHEL/ customer stores, contractor shall ensure that the balance / other materials are stacked back immediately.
- 39.2 While BHEL will endeavour to store/ stack/ identify materials properly in their open / close / semi closed / tarpaulins covered storage yard/ shed, it shall be contractors responsibility to assist BHEL in identifying materials well in time for erection, taking delivery of the same, following the procedure indicated by BHEL and transport the material safely to pre-assembly yard/ erection site in time, according to programme.
- 39.3 The contractor shall take delivery of components, equipment / consumables from storage area after getting the approval of BHEL Engineer on standard indent forms.
- 39.4 The contractor shall identify and deploy necessary Engineers/ supervisors / workmen for the above work in sufficient number as may be needed by BHEL, for areas covering their scope.
- 39.5 All the equipment shall be handled very carefully to prevent any damage or loss. No untested wire ropes/ slings etc. shall be used for unloading / handling. The equipment shall be properly protected to prevent damage either to the equipment or to the floor where they are stored. The equipment from the stores shall be moved to the actual location at the appropriate time so as to avoid damage of such equipment at site.
- 39.6 Contractor shall ensure that while lifting slings shall be put over the points indicated on the equipment or as indicated in the manufacturer's drawings. Slings/ shackles of proper size shall be used for all lifting and rigging purposes. All care shall be taken to safeguard the equipment against any damage. In no case piping should be dragged. In case of any damage the cost shall be covered from the contractor.
- 39.7 Approach road conditions from the stores / yards to the erection site may not be equipped and ideal for smooth transportation of the equipment. Contractor may have to be adequately prepared to transport the materials under the above circumstances without any extra cost to BHEL.
- 39.8 Contractor shall be responsible for examining all the plant and material issued to him and notify the Engineer immediately of any damage, shortage, discrepancy etc. before they are moved out of the stores / storage area. The contractor shall submit to the Engineer every week, a report detailing all the receipts during the week. However, the contractor shall be solely responsible for any shortages or damages in transit , handling, storage and erection of the equipment once received by him. As the erection work will be spread in different areas / locations of the project, contractor has to arrange sufficient no. of watch/ward personal to avoid any pilferage of material. In case any equipment / material is lost / damaged while in the custody of the contractor, the cost of repair / replacement if any to bring back the equipment in original order shall be deducted from the contractor's bill. BHEL's decision in this regard shall be final and binding on the contractor.

- 39.9 The contractor shall maintain an accurate and exhaustive record detailing out the list of all equipment received by him for the purpose of erection and keep such record open for the inspection of the engineer at any time.
- 39.10 All the material in the custody of contractor and stored in the open or dusty locations must be covered with suitable weather proof / fire retardant covering material wherever applicable and shall be blocked up on raised level above ground. All covering materials including blocks and sleeper shall be arranged by the contractor at his cost.
- 39.11 All electrical panels, control gear, motors and such other devices shall be properly dried by heating before they are installed and energised. Exposed parts those required special protection such as bearings, slip rings, commutators shall be protected against moisture ingress and corrosion during storage and are periodically inspected. Heavy rotating parts in assembled conditions shall be periodically rotated to prevent corrosion due to prolonged storage.
- 39.12 If the material belonging to the contractor are stored in area other than those earmarked for his operation the engineer will have the right to get it moved to the area earmarked for the contractor at the contractors risk and cost.
- 39.13 The contractor shall ensure that all the packing materials and protective devices used for various equipment during transit and storage are removed before the equipment are installed.
- 39.14 The contractor shall be responsible for making suitable indoor storage facilities to store all equipment (drawn by the contractor from BHEL / customer stores) which require indoor storage till the time of their installation. The Engineer will direct the contractor in this regard, which item in his opinion will require indoor storage and the contractor shall comply with Engineer's decision
- 39.15 **The contractor shall ensure that all surplus / damaged / dismantled scrap materials / unused material, packing wood / containers/ special transporting frames etc. are returned to BHEL at a place in project area identified by the Engineer.** An account will be maintained by the contractor for all such items received and returned to BHEL and duly reconciled before closing of the contract.
- 39.16 The contractor shall hand over all parts / materials remaining extra over the normal requirement with proper identification tags to the concerned BHEL / Customer or at a place in project area as directed by BHEL Engineer.
- 39.17 All the assistance required for lodging of Insurance claims, FIRs Arranging Material Gate Passes, Packing of defective materials etc. shall be carried out by Contractor.

#### **40.0 PRESERVATION OF COMPONENTS**

- 40.1 After taking delivery from BHEL / customer's stores, plant materials storage shall be subjected to the following protection besides other provisions indicated in these specifications elsewhere.
- a) Items stored outdoors shall be stored in such a way that item is at least six inches (6") above the ground

- b) Motors, valves, electrical equipment, control equipment and instruments etc. shall be stored indoors in warehouse provided by contractor. Motor windings shall be kept dry by use of external heat or space heaters.
  - c) Bearings and other wearing surfaces of plant materials shall be protected against corrosion and kept clean.
- 40.2 It shall be the responsibility of the contractor to apply preservatives / touch up paints (primer) on equipment handled and erected by him till such time of final painting. It shall be contractor's responsibility to arrange for required paints (Primer), thinners, labour, scaffolding materials, cleaning materials like wire brush, emery sheets, etc., cleaning of surface and provide one coat of preservatives / paints (primer) from time to time as decided by BHEL engineer. The accepted rate shall include this work also. It is to be noted that such painting may have to be done as and when required till such time the final painting is carried out.
- 40.3 The contractor shall effectively protect the finished work from action of weather and from damage or defacement and shall cover the finished parts then and there for their protection.
- 40.4 Any failure on the part of contractor to carry out works according to above clauses will entail BHEL to carry out the job from any other party and recover the cost from contractor.

#### **41.0 WELDING and NDT**

- 41.1 The method of welding ( ARC, Gas, TIG or other method) may be indicated in the detailed drawings / schedules. BHEL Engineer will have the option of changing the method of welding as per site requirements.
- 41.2 All welders including tack welder , structural and pipe welder shall be tested and approved by BHEL Engineer before they are actually engaged on work. BHEL reserves the right to reject any welder if the welder's performance is not found to be satisfactory. All charges for testing of contractor's welders including destructive and non destructive tests conducted by BHEL at site or at laboratory shall have to be borne by the contractor only. The test coupons raw material will be supplied by BHEL free of cost
- 41.3 Engineer may stop any welder from the work if his performance is unsatisfactory for any technical reason or if there is a high percentage of rejection of joints welded by a particular welder which, in the opinion of the Engineer will adversely affect the quality of the welding though the welder has earlier passed the tests prescribed by Engineer. The welder's having passed qualification tests does not absolve the contractor of contractual obligation to continuously check the welder's performance.
- 41.4 Faulty welds shall be cut and re-welded at the contractors expenses. The procedure for the repair of defective welds shall be approved by the Engineer prior to any repair being made. Records of such repairs and defects shall be maintained by the contractor as per BHEL Engineer's advice
- 41.5 All charges for testing of contractor's welders including destructive and non destructive tests conducted by BHEL at site or at laboratory shall have to be borne by the contractor only.

- 41.6 Only BHEL approved make electrodes will be used. All electrodes shall be baked and dried in the electric electrode baking oven to the required temperature for the period specified by the Engineer before these are used in erection work. All welders shall have electrodes drying portable oven at the work spot. Electrodes from holding oven shall be transferred to portable ovens. The electrodes brought to the site will have valid manufacturing test certificate. The test certificate will have co-relation with the lot No. / batch No given on electrode packets. No electrodes will be allowed to be used in the absence of above requirement. The thermostat and thermometer of electrode drying oven will be calibrated and test certificate from Govt. approved / accredited test house traceable to National / International standards will be submitted to BHEL before putting the oven in use. Periodical calibration for the same shall also be arranged by the contractor within the finally accepted rates.
- 41.7 The regulators used on welding machines shall be calibrated before putting these into use for work. Periodic calibration for the same shall also be arranged by the Contractor at his cost.
- 41.8 All welds shall be painted with anticorrosive red oxide paint. Necessary consumables and scaffolding etc. including paints shall be provided by contractor at his own cost. Daily welding reports in the proforma suggested by BHEL should be submitted without fail.
- 41.9 Non-destructive testing are part of erection work and shall be carried out by the contractor in accordance with the quality plan and as per instruction of Engineer. Decision of Engineer shall be final and binding on the contractor.

## **42.0 PROGRESS REPORTING**

- 42.1 Contractor is required to draw mutually agreed monthly erection programmes in consultation with BHEL well in advance. Contractor shall ensure achievement of agreed programme and shall also timely arrange additional resources considered necessary at no extra cost to BHEL
- 42.2 Weekly progress review meetings will be held at site during which actual progress during the week vis-a-vis scheduled programme shall be discussed for actions 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. All quality problems shall also be discussed during above review meetings. Necessary preventive and corrective action shall be discussed and decided upon in such review meetings and shall be implemented by the contractor in time bound manner so as to eliminate the cause of non-conformities. Contractor shall ensure that the quality is maintained in all the works connected with this contract at all stages of the requirement of BHEL
- 42.3 The contractor shall submit daily, weekly and monthly progress reports, manpower reports , materials reports, consumables (gases / electrodes) report and other reports as per proforma considered necessary by the Engineer. Contractors shall arrange for the inspection of works at various stages as required by BHEL. The contractors shall take immediate corrective action for the non-conformance if any observed and pointed by the BHEL

- 42.4 The progress report shall indicate the progress achieved against planned, with reasons indicating delays, if any, and shall give the remedial actions which the contractor intends to take to make good the slippage or lost time, so that further works again proceed as per the original programme and the slippages do not accumulate and effect the overall programme.
- 42.5 The daily manpower reports shall clearly indicate the manpower deployed, category wise specifying also the activities in which they are engaged.
- 42.6 The protocols between contractor and customer/BHEL shall be made prior to the installation for correctness of calibration, alignment etc.
- 42.7 Total quality is the watchword of the work and standards as per procedures laid down by BHEL. Any modifications suggested by BHEL/customer engineers shall be carried out without any extra cost to BHEL

### **43.0 DRAWINGS AND DOCUMENTS**

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

### **44.0 INCOME TAX , SERVICE TAX AND SALES TAX ETC**

- 44.1 TDS under Income Tax, Sales Tax, VAT and surcharge etc, if any, shall be deducted at prevailing rates on gross invoice value from the running bills unless Exemption Certificate from appropriate Authority / Authorities is furnished.

44.2 **Price quoted shall be inclusive of all taxes except service tax.** The service tax, as legally leviable & payable by the contractor under the provisions of applicable law/act, shall be paid by BHEL as per contractor's bill. However, contractor shall have to submit proof of service tax deposited by them immediately after the deposit but not later than the next bill submitted after the due date of deposit. The contractor shall furnish proof of Service Tax registration with Central Excise Division covering the services covered under this contract. Registration should also bear endorsement for the premises from where the billing shall be done by contractor on BHEL for this project. The contractor shall obtain prior approval of BHEL before billing the service tax amount and should submit proper CENVATABLE invoice as per Service Tax Rules.

With introduction of Cenvat credit rules 2004 which came into force w.e.f. 10.09.2004, excise duty paid on input goods including capital goods used for providing the output service and service tax paid on input service can be taken credit of against the service tax payable on output service. As such, while offering the rates, the contractors may take into account the benefit of above provisions as the cost of input to contractors will be the cost net of excise duty and service tax and adjust their offer price accordingly to make it more competitive.

44.3 In VAT applicable States, "Tax Invoice" if required under the relevant State VAT law shall be submitted alongwith other compliances as per concerned VAT Act.

44.4 Contractor shall get his organization registered with concerned sales tax/VAT authorities within 15 days of award of this contract, if applicable. The delay on this account and delay in bringing the material shall be to contractor's account and no extension of time shall be allowed on this account. The sales tax/VAT registration for this contractor shall be forwarded to BHEL within 30 days from the date of LOI. In case the contractor is already registered for sales tax/VAT with Govt. Authorities he must quote his registration no, while submitting their tender.

44.5 Contractor has to make his own arrangement at his cost for completing the formalities, if required, with Sales Tax/VAT Authorities, for bringing their materials, plants, and equipment at site for the execution of the work, including arrangement of Road permit as applicable under this contract.

## **45.0 EXTRA WORK:**

45.1 BHEL may consider for payment of extra works on manhour basis @ Rs.30/- (Rupees thirty only) per manhour only for such of those works which:

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

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

45.3 The extra works, if any, shall be carried out by a separate gang or beyond working hours which can be identified for certification of manhours. Log book should be maintained and should be signed jointly by the contractor's representative and the BHEL Engineer on day to day basis. However, signing of the log book does not necessarily mean acceptance of

the extra works which would be identified by Engineer whether work is covered in one of the above categories. Only those works and manhours which are certified by the BHEL Engineer-in-charge, will be considered for payment. The decision of BHEL in this regard shall be final and binding on the contractor.

#### **46.0 PRICE VARIATION – Not applicable**

#### **47.0 RATE SCHEDULE**

47.1 Contractor shall fully understand equipment description and scope of work before quoting. The scope of work and responsibility of the contractor as mentioned under these specifications shall be covered within the quoted rates / price.

47.2 **The tenderer shall quote the rates / Price as per the rate schedule only, in part II price bid (Original).** Conditional price bids or price bids with any deviation / clarification etc. are liable to be rejected. No cutting / erasing / over writing shall be done.

47.3 **Contractor's total quoted price as per rate schedule will be taken as tentative only. The contractor undertakes to erect / commission actual quantities as per advice of BHEL Engineer and accordingly the final contract price shall be worked out on the basis of quantities actually erected at site and payments will also be regulated for the same. The quantities indicated against each item may vary to any extent and no compensation will be payable in variation of Individual quantity.**

Contractors are requested to take above into account while quoting. The contractor confirms that unit rates quoted above takes care of such variation during execution stage.

#### **48.0 INSTRUCTIONS TO TENDERER**

48.1 Offers received without data / information required to be submitted under tender clauses-11.1 to 11.11 are liable to be rejected. All these data / information should be duly supported by documentary evidences (Refer note below clause-11)

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

48.3 The tenderers are advised to actually visit the site and fully acquaint themselves with site conditions, location of stores, transportation routes, quantum of work etc. before quoting their rates for this work. BHEL shall not be responsible in any way for non-familiarisation of site conditions. Once the tenderer has quoted for the work, it is implied that he has ascertained various site condition and NO CLAIM whatsoever will be entertained by BHEL on any such account.

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

## 49.0 LIQUIDATED DAMAGES (LD)

49.1 This clause shall be applicable as per clause no. 25.5 of the GCC of the tender.

## 50.0 SECURITY DEPOSIT

50.1 The contractor shall submit Security Deposit within 15 days from the date of issue of LOI as per clause no. 16.2 of the General Conditions of Contract (GCC). In case the contractor opts to furnish Bank Guarantee as a part of Security Deposit, the BG shall be issued as per the Performa enclosed as per Annexure- H of the GCC and also that the BG should be issued preferably through any of the Member Banks as listed in GCC;

For BG through any other Nationalized Bank (Not covered in the list of Member Banks of GCC), the discretion of its acceptance shall lie solely with BHEL.

## 51.0 OTHERS

### 51.1 INSURANCE

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

51.1.2 Insurance for all materials pertaining to the Contractor (T&Ps, Construction Materials etc.) during transit, storage and during construction shall be in his (Contractor's) scope.

51.1.3 The Contractor shall provide insurance cover to all persons employed/engaged by him throughout the period of Contract, including the extended period, if any.

51.1.4 In addition to insurance as per Workmen's Compensation Act, Employer's liability and also Group Personnel Insurance for employees are also to be taken by contractor.

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

51.3 The tenderer shall specifically confirm he has inspected the site of work and is fully conversant with the prevailing conditions under which work is to be executed and will not raise claim of any nature due to lack of knowledge of site condition. He will also confirm that local taxation laws at the site have been clearly understood by him.

51.4 The Price Bids of only those bidders will be opened who will be qualified for the subject job on the basis of pre-qualification evaluation / Techno-commercial bids and **acceptance of customer**. BHEL reserves the right to reject the bidders with unsatisfactory past performance in the execution of a contract. BHEL's decision in this regard shall be final & binding.

## **SPECIAL CONDITIONS OF CONTRACT**

### **PART-B**

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## SPECIAL CONDITIONS OF CONTRACT

### SECTION-III (PART-B)

#### 52.0 General:

The scope of work of R & M covered for the above project is classified as detailed below:-

- 52.1 Dismantling the existing panels of station C&I, SG controls system (FSS/BMS, SADC and APRDS), instruments, Turbovisory panel, associated field sensors, hardware like cables, Impulse lines, final elements etc. wherever required as detailed in BOM.
- 52.2 Modification of existing control desk, control panels, providing necessary cut outs in the control panel/desk, modifying floor cut outs for installation of panels (wherever required), modifying/relaying the existing impulse lines/erection of new impulse lines to match the new instruments wherever required.
- 52.3 Calibration, testing, erection, checking and commissioning of complete new equipment/instrument and hardware enumerated in the rate schedule for the following main systems/equipment as per BHEL Engineer instructions. Panel Base frame wherever required will be also be fabricated at site and its rates are covered in panel erection rates.
- a. Steam Generator Package panels for FSSS/BMS, SADC, Oil Firing Station, Oil Pump House, mills system, Soot Blower Station, all types of electrical/pneumatic actuators & dampers, all fans-AC/DC and Auxiliary PRDS.
  - b. Station C & I System
  - c. DAS/MMI system
  - d. Vibration/turbo supervisory monitoring system
  - e. Temperature, pressure and flow measurement in various system like Air and Flue Gas, Steam and Water, Oil system etc.
  - f. Control desk/measurement Instrument panel work.
- 52.4 **Removal of cables:** All the existing cables from field to control desk/panel, MCC to Panel/desk, MCC to Valves/dampers/actuators etc will have to be removed from old panels and cable trays to make space for the new cables which will be laid and terminated. If the existing cable trays are not sufficient , new cable trays will be erected. Work involves identifying the cables, disconnecting the existing connection at both end of the cable and their removal from panel/tray , re-rolling and handing over to the customer store or its glanding/re-termination if cable is to be reused in new panel (if any).
- 52.5 **Scope of work for Store Management:** Please refer to clause 1.1.3

**52.6 BHEL Site office requirements :**

- a. Contractor will arrange for one lap top computer and one desk top Computer with latest configuration and other peripherals like printers, CD/DVD writer etc including their maintenance for use of BHEL staff during the entire site duration. Data card /USB port internet card for internet connectivity on desk top/lap top/mobile
- b. Two number of activated Mobile Phones for the entire site duration for use by BHEL staff.
- c. To Provide for peon/office boys – 2 nos for the exclusive use of BHEL site office for the entire job duration.

**53. SCOPE OF WORK IN GENERAL BUT NOT LIMITED TO THE FOLLOWING**

- 53.1 **Scope :** Dismantling of existing C&I systems, Receiving materials from stores , verifying, identifying and transporting them to site for erection or storage of equipment/materials as the case may be including stores management is in contractor scope of work. Contractor must make his own arrangements for loading at stores, transportation to site for erection and unloading at site. Similarly all dismantled materials will be shifted to scrap yard by contractor. It includes technical assistance for checking and making the shortages/damage report after taking delivery from stores, transporting to site, erecting the equipment. Commissioning of all equipment and completing associated activities like, carrying out the tests as required, pre commissioning checks and commissioning, maintenance /defects attending up to time of the completion of the commissioning activities and handing over the unit to BHEL's Customer. Shifting of the already received materials from the existing stores to new stores area if required .
- 53.2 **Calibration:** Contractor shall calibrate, erect and commission all the equipment cabinets, instruments, cabling etc as per the sequence prescribed by BHEL at site.
- 53.3 **Certificates/Licenses:** All the necessary certificates and licenses required to carry out this work are to be arranged by the contractor expeditiously at his cost.
- 53.4 **Nature of Work:** The nature of work being renovation and modernization though all steps have been taken to assess the requirements to the extent possible. However, during the course of work, if some additional items other than what is specified are to be erected, the contractor shall do the dismantling in consultation with BHEL engineer. The contractor shall maintain proper records indicating the quantity of old materials re-used for this work. In case of shortage of any erection hardware like JB's, copper tubes, impulse

- lines, fittings, cables etc., the contractor shall try to use the old materials in consultation with BHEL Engineer/Customer.
- 53.5 **Old panels:** Old panels are to be removed. While removing care shall be taken to avoid damages to panels/instruments that are being retained. Before removing the panels, the contractor shall ensure disconnection of Power supply, control cables and identify them with proper tagging for future use with new panels.
- 53.6 **Erection of Panels :**  
All the panels /panel shipments may have to erected after altering/minor civil works of existing cutouts. Minor civil works like chipping, preparation of cutouts etc. is included in scope of work of the contractor. The scope of installation includes fabrication of base frame, fixing of anti vibration pads, leveling, alignment, welding, drilling of gland plates for cable entry and sealing of bottom entry with suitable compounds after completion of work.
- 53.7 **Instruments:** Apart from the new instruments, some of the old instruments like transmitters, switches, recorder, thermocouples, RTDs etc may have to be checked for healthiness and proper functioning. The scope of work covers calibration, installation and commissioning if required of
- All types of transmitters.
  - Thermocouples, RTDs, Pressure switches, temperature switches etc.
  - Pressure/temperature gauges /Switches, DP gauges / switches
  - Air filter regulators, E/P Convertors
  - Mounting of position feed back transmitters for valves / limit/torque switches.
  - All dismantling and erection of FSSS panel and instruments.
- The scopes of work for transmitters includes fixing the instruments on the rack/supports along with manifolds, connection between manifolds and transmitters with SS tube, drain valves, associated fitting and clamps including fabrication of suitable canopies along with supports, racks for transmitters.
- The scope of installation of Thermo-well includes seal welding of the same wherever required. If drilling grinding, tapping etc are required for mounting the instruments, the contractor as per instruction of BHEL Engineers shall carryout the same. No separate additional payment will be made for this.
- 53.8 **Cabling:** For new cables, the scope includes transporting the cable from stores, cutting the cable to the required route length, laying of cables, drilling of holes in the panels/JBs etc. fixing of cable glands and termination of cables.
- 53.9 **Fabrication and erection of steel and painting :** Most of field instruments will be mounted in prefabricated racks being supplied to site. Contractor will carry out erection of prefabricated rack at site locations and then mount field instruments in rack. Impulse piping from different tapping points to instruments will be done by

contractor. However for some of instruments like analysers, JB's etc local fabrications as per site requirements will be done. The contractor scope includes fabrication of base frames, support JB frame, enclosures, impulse pipe supports, cable tray supports etc wherever required as per instruction of BHEL engineer. Erection materials i.e. angels, channels of different sizes etc will be supplied by BHEL. The payment shall be made on tonnage basis for erection materials . It includes the painting of all steel structures such as frames/ fabrication work done at site . All consumables like primers, paints, brush etc. are in the contractor scope of supply.

- 53.10 **TURBINE SUPERVISORY:** The scope of work for turbine supervisory system include shifting of materials of place of installation, installation of panels (at local and Control room) Junction Boxes (JBs). The cabling scope includes the cabling between JB's to panels, between local panel to remote panel, and between remote panel to control desk. Erection and commissioning support to Sub vendor for the mounting, erection and commissioning of all the sensors, gear wheel mechanism and other support for commissioning of the system is also to be provided by the contractor. Work like making Brackets, mounting frames for sensors and modification in the existing system are to be carried out by the contractor with in the quoted price. Prior to the installation of the new system, the existing system is to be removed. The commissioning assistance is to be provided by the contractor.
- 53.11 **UPS** The scope of work includes erection of UPS panels, Batteries , Charger , ACDB and the associated cabling.
- 53.12 **24V DC battery Supply :**  
The scope of work includes erection of Batteries , Charger panels , DCDB and the associated cabling.
- 53.13 **SWAS :** Scope of work includes installation of sensors, erection of . samples lines from root valve to panel, wet and dry panels, associated cabling and impulse line work.  
Commissioning assistance is to be provided by the contractor. Contractor is advised in his own interest to visit site before submitting offer.
- 54.0 COMMISSIONING :** The scope of work in Pre-commissioning / commissioning/post-commissioning for various commissioning activities of the main plant are as referred below.
- Trial run of various equipments/loops/circuits .
  - Light up of boiler for alkali boil out/chemical cleaning and steam blowing.
  - Turbine barring gear and rolling
  - Electrical testing and Synchronisation
  - Coal firing and unit stablisation
  - Full load operation
  - Handing over to customer.

When carrying out above activities, trial runs may have to be repeated till satisfactory results are obtained to the satisfaction of customer/consultant. The contractor shall co-ordinate with other agencies during the main plant commissioning to ensure successful commissioning of total plant. Contractor shall ear-mark separate manpower for various commissioning activities including cable continuity checking, signal conditioning and instrument charging and commissioning. The manpower shall not be disturbed or diverted.

The contractor shall provide all Instruments digital meters, meggers, continuity testers etc in adequate quantity for commissioning. Indicative list is enclosed in the end

It is the responsibility of the contractor to arrange and complete all the testing, pre-commissioning and commissioning activities for the particular equipment as per BHEL norms. All the above will be witnessed by the BHEL engineers and report signed jointly with BHEL/ Customer.

## **55.0 FINISH PAINTING - Not applicable**

## **56.0 FACILITIES TO BE PROVIDED BY BHEL/CONTRACTOR**

- 56.1 Contractor has to make his own arrangements for the accommodation of his staff , workers , supervisors and engineers . All transport etc will also be arranged by contractor. **Open space** for building of temporary office shed and contractor's stores shed will be provided free of charge.
- 56.2 The Contractor shall be responsible for providing all necessary facilities like residential accommodation, transport, electricity, water, medical facilities etc. at his own cost as required under various labour laws and statutory rules and regulations framed there under to the personnel employed by him.
- 56.3 **ELECTRICITY:** For site construction purpose electricity will be provided free at one point. Power supply distribution board is to be arranged by contractor. But for contractor's office and stores shed, electricity will be provided on chargeable basis. Contractor will arrange to install electricity meter on his own from the concerned distribution agency of PSEB at one point as per his load requirements and pay for the electricity consumed to the concerned agency/PSEB/. All formalities including filling of forms , security money and other fees etc to be deposited is in scope of contractor . Further distribution from this point onwards will again be done by contractor himself. On completion of job contractor will arrange to get his all dues cleared and meter disconnected.
- 56.4 **Water:** For construction and drinking purpose water at one single point will be provided free of charge. The contractor at his owns cost shall arrange further distribution.

**NOTE:**

- **THOUGH BHEL IS GETTING THE CONSTRUCTION POWER AND WATER ON FREE OF CHARGE BASIS FROM THE CUSTOMER. , THE CONTRACTOR SHALL ENSURE THAT THERE IS NO WASTAGE. THE CONTRACTOR MAY HAVE TO INSTAL A METER FOR THIS PURPOSE . PERIODICAL AUDITS WILL BE HELD TO ENSURE THAT THESE RESOURCES ARE BEING OPTIMALLY USED.**
- **IN CASE ANY WASTAGE IS OBSERVED BHEL RESERVES THE RIGHT TO RECOVER ANY CHARGES / PENALTIY AS DEEMED FIT TO BE DECIDED BY BHEL ENGINEER**

**Contractor will have to provide insulated cables for power distribution and jointing ( if any ) will have to be done with proper jointing kits .**

- 56.5 Provision of distribution lines of both electrical power and water from the central points to the required place with proper distribution boards observing the safety rules laid down by the electrical authorities of the state shall be done by the contractor, supplying all the materials like cables, distribution board, switch boards, TPN, CBS, ELCBS/ MCCBS / Copper / Brass clamps, copper conductor, change over switches pipes etc. at his own cost. If any failure is caused in supply of the power and water, it is the responsibility of the contractor to make alternate arrangements at his cost. The contractor shall adjust his working shifts / hours accordingly and deploy additional manpower if necessary so as to achieve the targets.
- 56.6 Following points should be strictly adhered to by the contractor while drawing construction power supply from Distribution Board.
- (a) All electrical installations should be as per Indian Electricity rules.
  - (b) All distribution Boards installed by the contractor should be constructed with fire proof materials viz. steel frames, bakelite sheets etc.
  - (c) Connection for single phase should be taken from phase and neutral. No where the connection should be taken with earth as neutral.
  - (d) All electrical connections should be made through connectors, nuts and bolts, switches, plug and sockets. Loose connections or hooking up of wires shall not be permitted.
  - (e) Contractor have to make their own earthing arrangement for their equipment / DB earthing. Earthing connection have to be done with copper conductor and copper / brass clamps with BHEL's prior permission.
  - (f) All electrical equipment / tools and plants should be properly earthed. DBs to be earthed diagonally opposite at two points.
  - (g) Contractor should use "MCCB" and "ELCB" either on incoming or outgoing connections to the DBs.
  - (h) Contractor should ensure that all the CBs / TPNs / Fuses / MCCB / ELCB cables etc. should be of adequate rating/ capacity.

- (i) For permission of supply connections contractor has to submit a test report of their installations with a single line diagram of connected / proposed loads. Contractor will submit a report on all electrical connected load by the 7<sup>th</sup> of every month.
- (j) ELCB will be tested once in a week or as deemed fit by BHEL Engineer by actually simulating the earth leakage for all installations and the same shall be recorded by BHEL Engineer in the log book to be maintained by the contractor.
- (k) In case of power cuts / load shedding no compensation for idle labour or extension of time for completion of work will be given to contractor.
- (l) Adequate lighting facilities such as flood lights, hand lamps and area lighting shall be arranged by the contractor at the site of construction, contractor's material storage area etc. within finally accepted rates.

56.7 On completion of work or as and when required by BHEL, all the temporary buildings, structures, pipe lines, cables etc. shall be dismantled and levelled and debris shall be removed as per instruction of BHEL by the contractor at his cost. In the event of his failure to do so, same will be got done by the Engineer and expenses incurred shall be recovered from the contractor along with prevailing overhead. The decision of BHEL Engineer in this regard shall be final.

## 57.0 TIME SCHEDULE

The contractor has to mobilize his resources and work force within a week, from the date of LOI in such a manner that the entire electrical /C &I work covered in his scope is completed in six MONTHS.

**Time is the essence of the contract. The entire work is to be completed in six months time and this being a R & M job , timely mobilization of adequate and skilled manpower, is of utmost importance . As a matter of routine contractor will ensure that site work is continued on all Sundays and other holidays. In addition Where-ever required and as per directions of BHEL Engineer , the contractor will arrange for round the clock working to achieve milestone targets . Contractor should note this point very carefully as skilled and experienced Manpower in sufficient numbers will have to be arranged accordingly.**

The work under his contract is deemed to be completed in all aspects only when all the components/equipment are erected and trial run, tested and commissioned and taken over by customer. The decision of BHEL in this respect shall be binding with the contractor.

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

**58.0 OVER RUN – No over-run charges shall be payable in this contract.**

## 59.0 TERMS OF PAYMENT

- 59.1 The 'Engineer' will certify regarding the actual work executed in the measurement books and bills, which shall be accepted by the contractor in measurement book.
- 59.2 Contractor shall submit bills for the work completed under the specification, once in a month detailing work done during the month. The format for billing shall be approved by BHEL before raising invoices.
- 59.3 Subject to any deduction which BHEL may be authorized to make under the contract, the contractor on the certificate of the Engineer at site be entitled for payment as explained hereunder:

### **Payment against work will be released as given below**

- A. 10 % of item rate on stores issue and final placement at site.
- B. 30% of item rate shall be payable on erection/ installation/welding/final position/laying
- C. 10 % of item rate on charging/calibration/termination/lab checking
- D. 10% of item rate on testing/ pre-commissioning/loop checking of individual equipment/instruments/system.
- E. 10 % of item rate on boiler steam blowing/Turbine barring gear
- F. 5 % of item rate on synchronization of machine
- G. 5 % of item rate on full load operation of machine
- H. 10 % of item rate on pending point clearance and making the machine ready for trial run and PG test .
- I. 5% of item rate on completion of trial run and PG test.
- J. 5 % of item rate on successful handing over of machine

### **Security deposit**

The security deposit will be released after the completion of guarantee period which is 12 months after completion of PG test or handing over of unit to customer which ever is later .

**CONTRACTOR SHALL NOTE THAT PAYMENT FOR ALL RUNNING BILLS WILL BE RELEASED ONLY ON PRODUCTION OF A CERTIFICATE ISSUED BY SITE IN CHARGE THAT THE CONTRACTOR HAS FULFILLED ALL THE CONTRACTUAL & STATUTORY REQUIREMENTS. PAYMENTS SHALL BE MADE IN 30 DAYS TIME FROM THE DATE OF RECEIPT OF BILLS AT BHEL CHANDIGARH.**

The payment for the bills will be released only after production of following documents duly verified by customer engineer.

- PF Registration /membership certificate
- Labour License
- Workmen Insurance Policy
- ESI
- Wage sheets/muster rolls verified by customer engineer

**INDICATIVE LIST OF T & P TO BE ARRANGED BY THE CONTRACTOR  
AT HIS OWN COST for C&I WORK**

S.NO.	DESCRIPTION	RANGE	ACCURACY	QTY
1.	Dead Weight Tester	0-600Kg/cm <sup>2</sup>	LC-0.5Kg/cm <sup>2</sup>	01 Set
2.	Comparison test set (With Sub-standard Pressure gauges)	0-1 Kg/cm <sup>2</sup>	$\pm 0.25\%$ Lc-0.02Kg/cm <sup>2</sup>	! 01 Set ! !
		0-4 k g/cm <sup>2</sup>	----do-----	!
		0-6 Kg/cm <sup>2</sup>	----do-----	!
		0-10kg/cm <sup>2</sup>	----do-----	!
		0-25Kg/cm <sup>2</sup>	+0.25%Lc-0.25 Kg/cm <sup>2</sup>	!
		0-60Kg/cm <sup>2</sup>	1 $\pm 0.25\%$ Lc-1.0 Kg/cm <sup>2</sup>	!
		0-250Kg/cm <sup>2</sup>	$\pm 0.25\%$ Lc-2.5 Kg/cm <sup>2</sup>	!
		0- 400Kg/cm <sup>2</sup>	$\pm 0.25\%$ Lc-2.5 Kg/cm <sup>2</sup>	!
3.	Variable DC regulated (Electronic voltage source with digital indication).	0-30V DC	0.2%	1 No
4.	Oil bath with thermostat, Stirrer and sub-standard Glass Thermometers in Multiple ranges	0-300 Degree Cel.		1 set.
5.	Glass U tube mercury mano-meter with standard steel Scale having leveling arrangement.	0-760 mm		As per requirement
6.	Glass U tube mercury mano-meter with standard steel Scale having leveling arrangement.	0-1000 mm		As per requirement
7.	Vacuum pump unit	0 to (-) 1 bar	lc – 0.02 bar	1 No.
8.	mA/mV source with Digital display.	0-200 mA/200mV		01 No.

S.NO.	DESCRIPTION	RANGE	ACCURACY	QTY
9.	Rehostat	100 Ohm , 10 A		03 Nos.
10.	Precision Digital Multimeter	4-1/2 Digits		01 No.
11.	Digital multimeters	3-1/2 Digits		04 Nos
12	High temp. instrument Calibration kit	upto 600 deg.		1 No
13	Decade Resistance box	upto 10 L ohms		1 No
14	500 V / 1000V, (Hand operated ) megger			1 No
15	Single phase variac	15 A		1 No.
16	hydraulic test pump	upto 250 Kg/mm2	+0.25 %	1 No.
17	Contunity testers		as per requirement.	
18	Intercom / telephone set for loop checking			1 No.

## Notes:

1. The above list of testing instruments/equipment required for testing / commissioning is only for guidance to contractor and not complete. Any other / additional testing instruments/equipment required for timely and satisfactory completion of job will also be arranged by contractor at his own cost.
2. Contractor must re-ascertain /recheck range and accuracy of each IMTE from BHEL Engineer well in advance before arranging calibration / deployment of IMTE's.
3. Other terms and conditions regarding above items shall be governed by tender document.

**Annexure-II**

Indicative list of IMTEs to be arranged by the **CONTRACTOR** for **ELECTRICAL RELATED WORK**

Sl. No.	EQUIPMENT	QTY
1.	500 V / 1000V, (Hand operated ) megger -----	1 No.
2.	2.5 KV and 5 kV (Main operated megger) -----	1 No.
3.	HV Test Kit 0 to 60 KV (100mA leakage current) -----	1 Set
4.	Digital Multimeters with current probe-----	4 Nos
5.	Tong Testers ( various ranges )including mA Range -----	3 Sets
6.	Micro ohm meter with 100Amps DC Source-----	1 Set
7.	Motor checker -----	1 No.
8.	Millivolt drop test kit with 100 Amps source -----	1 No.
9.	Analog Multimeters -----	2 Nos
10.	Single / three phase variac -----	1 Each

**Notes:**

- The above list of testing instruments / equipment required for testing / commissioning is only for guidance to contractor and not complete. Any other / additional testing instruments / equipment required for timely and satisfactory completion of job will also be arranged by contractor at his own cost.
- Contractor must re-ascertain /recheck range and accuracy of each IMTE from BHEL Engineer well in advance before arranging calibration / deployment of IMTE's
- Other terms and conditions regarding above items shall be as per clause no. 37 (Tools & plants / IMTEs).

**Annexure-III**

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

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

Tenderers Name and Address

Place: (Signature of the Tenderer with stamp)

Date:

**NON DISCLOSURE AGREEMENT  
Memorandum of Understanding**

BHEL PSNR is committed to Information Security Management System as per Information Security Policy.

M/s....., providing.....service to BHEL PSNR, Noida hereby undertake to comply with the following in line with Information Security Policy of BHEL PSNR;

- To maintain confidentiality of documents & information which shall be used during the execution of the Contract.
- The documents & information shall not be revealed to or shared with third party which shall not be in the business interest of BHEL PSNR.

( )  
M/s. BHEL, PSNR

( )  
M/s.....

**ANNEXURE-V****GENERAL TERMS AND CONDITIONS OF REVERSE AUCTION (RA)**

Against this enquiry for the subject item / system with detailed scope of supply as per our tender specification, BHEL-PSNR, NOIDA may resort to "REVERSE AUCTION PROCEDURE" i.e. **ONLINE BIDDING on INTERNET.**

1. For the proposed reverse auction, technically and commercially acceptable bidders only shall be eligible to participate.
2. BHEL will engage the services of a service provider who will provide all necessary training and assistance before commencement of on line bidding on Internet.
3. In case BHEL decides to conduct reverse auction, BHEL's service provider shall contact the vendor directly and impart them the training.
4. Business rules like event date, time, start price, bid decrement, extensions, etc. also will be communicated through service provider for compliance.
5. Vendors have to fax the compliance form in the prescribed (provided by service provider) before start of Reverse auction. Without this the vendor will not be eligible to participate in the event.
6. **Total Price quoted shall be inclusive of all taxes except service tax in line with the NIT conditions for the subject work in Indian Rupees (INR), which is to be worked out as per the BOQ (Rate Schedule) given in tender enquiry and subsequent changes made, if any. EXCEL Sheet shall be provided, if applicable.**
7. Reverse auction will be conducted on schedule date & time.
8. At the end of reverse auction event, the lowest bidder value will be known on the network.
9. The lowest bidder has to fax the duly signed filled-in prescribed format as provided on case-to-case basis to BHEL through service provider after completion of event on the same day preferably.
10. Any variation between the on-line bid value and signed document will be considered as sabotaging the tender process and will invite disqualification of vender to conduct business with BHEL as per prevailing procedure.
11. In case BHEL decides not to go for Reverse auction procedure for this tender enquiry, the price bids and price impacts, if any already submitted and available with BHEL shall be opened as per BHEL standard practice.

**FORMAT OF UNDERTAKING**

**(To be submitted in the bidder's letter head)**

**REF:**

**Dt.**

**Bharat Heavy Electricals Limited  
Power Sector – Northren Region,  
Plot No. 25 , Sector - 16A ,  
Distt. Gautam Budh Nagar,  
NOIDA – 201 301.INDIA**

**Sub.: C&I Works of Boiler, TG and Station C&I for R&M and Uprating Job of  
Unit 3, 110 MW, GNDTP, Bathinda.**

Dear Sirs,

With reference to above, this is to confirm that as per tender conditions, we have visited [Harduaganj Units 8+9 site](#) before submission of our offer and noted the job content & site conditions etc.

We also confirm that we have not changed / modified the tender documents as appeared in the website and in case of observance at any stage, it shall be treated as null and void. We hereby confirm that we have not taken any deviation from tender clauses together with other references as enumerated in the above referred NIT and confirm our acceptance to reverse auctioning process and we hereby convey our unqualified acceptance to all terms and conditions as stipulated in the tender and NIT. In the event of observance of any deviation in any part of our offer at a later date whether implicit or explicit, the deviations shall stand null & void.

We confirm to have submitted offer strictly in accordance with tender instructions.

Thanking you,

Yours faithfully,

(Signature, date & seal of authorized representative of the bidder)

**RATE SCHEDULE**

<b>BILL OF QUANTITIES OF BOILER/TG/STATION C&amp;I UNIT#3, BATHINDA</b>					
<b>S.No.</b>	<b>Item/details</b>	<b>Unit</b>	<b>Qty.</b>	<b>Rate/ unit</b>	<b>Total</b>
1	Replacement of DCS PANELS/FSSS/FLAME SCANNER/SADC /SOOT BLOWERS /RELAY LOGIC /SG PANELS/BOP Panels/DC scanner fan panel				
1.1	Suite of 3(2250 X 800 X 2415)	No.	12		
1.2	Suite of 2 (1500 X 800 X 2415)	No.	3		
1.3	Suite of 1(750 X 800 X 2415)	No.	8		
2	UPS				
2.1	UPS PANELS	Set	1		
2.2	ACDB	Set	1		
2.3	Battery bank for UPS OR SMF battery	SET	1		
3	24 V DC system				
3.1	Charger and DCDB	SET	2		
3.2	SMF-Battery bank in rack	SET.	2		
3.3	24 DC Charger for BOP/SG/TG	No.	3		
4	Bar graph indicators/Recorders/Totalisers/Indicators	No.	58		
5	Instruments scope includes calibration, mounting , fixing , clamping , complete erection .canopy etc if required				
5.1	TRANSMITTERS directly mounted with canopy, for pressure/level/DPT etc.	No.	208		
6	Temp. element				
6.1	RTDs	No.	36		
6.2	Thermo couples alongwith Thermowells	No.	250		
6.3	Thermometers	No	50		
7	Solenoid valves	No.	4		
8.1	Pressure switches/temp. switches/DP Switches//indicators	No.	58		
8.2	Pressure gauges/Temp. Gauges	No	60		
8.3	Level Gauges	NO	13		
8.4	Level Switches	NO	18		
9	SWAS SYSTEM comprises the following panels/systems/Air condition/ Cooling Water Headers/Piping. Sampling Lines/Impulse pipes rates will be extra.				

9.1	WET PANEL/ Dry panel	Set	2	-----	-----
9.2	Primary rack etc	SET	2	-----	-----
9.3	CHILLER unit 100 % redundancy	SET	1	-----	-----
10	Conductivity Analyzers- 11 nos, PH analyzers – 6 nos, dissolved oxygen- 2 no, Silica analyzers – 2 no,Sodium Analysers-2,Hydrazine Analyser-1, Conductivity Analyser withdrawable type-2. The above analyzers are being supplied loose. These are to be mounted in the panels supplied and assistance is to be provided for their commissioning. Cables for these instruments are prefabricated. O2 Analysers,Hydrogen Analysers	NOS.	30		
11	Fixing of prefabricated LIR racks.	NOS.	58		
12	HMI SYSTEM consisting of the following items	Lot	1		
12.1	NETWORK PANEL size 800x800x2415 mm ( WxDxH)	No	1		
12.2	Work Stations/MAX Storion with PC/Monitors	No.	13		
12.4	PRINTERS	No.	8		
12.5	Furniture for PC and Printers	No	8		
12.6	CRT desk	NO	1		
12.7	Placemet of Other accessories, like UTP cables, Ethernet cables, Power distribution board,	LOT	1		
13	Fabrication of local racks if required to accommodate various instruments	TONS.	10		
14	Turbine supervisory system consisting of the following. The scope includes dismantling of existing cables/pickups , replacement of local panel/remote panel/proximeters/JBs ,installation of loose supplied racks in position, etc	Set	1		
14.1	Sensors/Speed Probes,Vibration Probes	NO	37		
15	Erection and commissioning of following Analyzers-				
15.1	Installation of SOX/NOX Analysis system with accessories and standard calibration units /cylinders/gas cylinder rack/FSHS boxes/Perma Pure Box,associated cabling, SS tubing,etc.Installation of Probes/Sensors/RTDs/Teflon Tube in duct leading to chimney.	Set	1		
15.2	CO-monitor consisting of transmitter, Receiver, blower, junction box and PVC pipe to connect the blower to transmitter and blower to receiver. The CO monitor is to be mounted in the duct leading to Chimney.	SET	1		

15.3	Opacity Analyser consisting of blowers,Tranceiver units, mounting of probes in duct leading to chimney, blower hoses, analyser panel, etc	Set	1		
15.4	Oxygen Analyser with all its accessories	Set	2		
16	Erection of impulse lines, cables, junction boxes, cable trays				
	Impulse lines laying work includes dismantling of old piping, provision of supports, routing, necessary branching with equal TEEs, reducers ,couplings , catch points, welding of root valves, socket welding and mounting with U clamps, hydraulic testing and painting work to include along with required welding consumables and paint, erection materials will be supplied. Welding should be carried out with qualified and certified welders.				
16.1	A 335 P22 ½” NB SCH 160	M	300		
16.2	A 312 SS 316 PIPE SCH160	M	1100		
16.3	A 312 TP316 ½” NB SCH 40	M	800		
16.4	A 106 GR C ½” NB SCH 160	M	800		
16.5	A 106 GR C ½” NB SCH 80	M	1500		
16.6	A 106 GR C ¾” NB SCH 80	M	1800		
16.7	A 106 GR C 1” NB SCH 80	M	700		
17	Laying and termination of Cables (armored / unarmored), copper conductor overall shielded including tagging, Ferruling, lugging and Glanding.cabling work includes removal of old cables from trays and returning them to customer's store/yard.Consumables such as ferrules, tie-belts, tags of reputed make are to be arranged by sub-contractor. Glands and lugs will be supplied by BHEL.				
17.1	12Pair/16P/24P X 0.5 Sq.mm, FRLS, shielded/armored	M	4500		
17.2	2P x 1.5 sq mm, 1.1KV,ATC,OL	M	15000		
17.3	1Pair/2P/4P/8P X 0.5SQmm,FRLS Armored/unarmoured/shielded	M	99850		
17.4	Compensating cables/ TC cables 2P/4P/6P X 1.5 sq mm, T/C EXTN	M	12000		
17.5	K type 2 pair and 4 Pair, 0.5 Sq mm ARM T/ C extension cable	M	7000		
17.6	RX type 2 pair 0.5 sq mm ARM, T/C extension cable	M	500		
17.7	Shielded cables 2P/4P x 0.5/1.5 mm <sup>2</sup>	M	5331		
17.8	2C/4C X 1.5/2.5Sq.mm, FRLS, HRPVC	M	9050		
17.9	7C/10C/19C x 1.5/2.5 Sqmm	M	16500		

17.1'0	10 P X 0.6 sq mm, Probe cable	M	500		
17.1	Power cables, aluminum/copper armored				
17.11.1	3C x 2.5Sq.mm	M	20200		
17.11.2	3C x 6Sq.mm AI	M	1200		
17.11.3	1C x 16/25Sq.mm, FRLS, PVC	M	7500		
17.11.4	2C x 6 Sq.mm	M	6000		
17.11.5	1C x 95Sq.mm, FRLS,PVC	M	13000		
	<b>If any additional cable/ gland/tray does not fall in any category , rates of next higher sized cable/gland/tray will be considered for payment</b>				
18	Junction boxes installation and fixing in field				
18.1	12-way/24-way	No.	101		
18.2	36 way/48-way	no	22		
18.3	64 way/128-way-24V	no	10		
19	Impulse lines				
	GI pipes/copper tubing / SS tubing	Unit			
	1" GI/SS/CS pipes	m	120		
	½ " GI/SS/CS pipes	m	2500		
20	6mm/ 8 mm tubing of CU/SS /CS	m	1500		
21	Cable trays				
	Cable trays-perforated/ladder	Unit			
	>50mm & <150mm	m	6354		
	>150mm & above	m	500		
22	Calibration/checking/Testing of Actuators - electrical /pneumatic and control valves/dampers. <b>Erection of above to be carried out by other agency</b>	No	96		
23	Master Clock System	Set	1		
24	BHEL Vision Electrode Probe, EWLI, Ascetor cabinet, Local/Remote Display Unit etc	Lot	1		
25	ERV Controller for SH ERV	Set	1		
26	Flame Scanner Head Assembly including Fibre Optic cable/cable upto local JB, Lens barrel Assembly, Miniature 6-way JB, etc and other field work.	Lot	1		
27	Field Instrument work of FSSS/Oil Guns/burners/Milling System/HEA Ignitor boxes/spark rods/solenoids/Flow Transmitters/Local maintenance boxes	Lot	1		

28	Replacement of Soot blower MCC,local startor boxes and checking of soot blowers from local,remote and DCS.(Erection of Soot Blowers is excluded)	Lot	1		
29	UCB and FAP Display Unit	NO	4		
30	Air Filter Regulators	no	60		
31	I/P Converters	No	50		
32	Purge Meter	No	8		
33	Heavy Duty Limit Switch	No	8		
34	Furnace Temp. Probe Starter Box	No	1		
35	DC Motor Starter Box	no	1		
36	Plasma Display Unit	Set	1		
37	Electronic earth pit preparation for Station . C &I along-with all materials	no	2		
<b>38</b>	<b>Total</b>				

NOTE:

1

The quantity mentioned for installation are indicative and shall be used for arriving the rate for each item. The quantity is likely to vary as the job is R & M in nature. Hence the final bill settlement shall be done as per the actual work carried out at site.

2

Identification/classification of the items and quantity shall be certified by BHEL Site Engineer for billing purpose. In all such cases the BHEL engineer decision is final and binding.

3

Contractor must quote for unit rates only where Quantities are mentioned. Where no quantity is mentioned ,no rate is to be quoted.

**NOTES FOR RATE SCHEDULE**

1. These rates shall be entered in figures as well as in words. In case of difference in rates between words and figures THE LESSER OF THE TWO will be treated as valid rate.
2. Accordingly taking into consideration all aspects thereof quoted above rates, further contractor confirms that he will not come with any other claim/compensation on account of any increase whatsoever during the entire period of execution including extended period if any.
3. In case of conflict between Unit Rate and Amount, 'Unit Rate' shall be considered for evaluation and award.
4. Evaluation and award shall be done considering all the items and respective quantities mentioned.
5. In case of omission in quoting any rate, the evaluation will be done considering the highest quoted rate obtained against that item. But the work, if awarded, will be on the lowest quoted rate obtained against that item.
6. Contractor's total quoted price as per rate schedule will be taken as tentative only. The contractor undertakes to erect / commission actual quantities as per advice of BHEL Engineer and accordingly the final contract price shall be worked out on the basis of quantities actually erected at site and payments will also be regulated for the same.

**(Seal and Signature of Tenderer)**